

## iray FAQ

(Version 2, 12 March 2010)

Question	Answer
<p>1. What is iray®?</p>	<p>iray is an intuitive to operate, interactive, consistent, high-performance global illumination rendering technology that generates photorealistic imagery by simulating the physical behavior of light. Unlike current ray-tracing renderers, iray does not depend on complex renderer specific shaders and settings to approximate global illumination. iray achieves its high level of performance by taking full advantage of the CUDA programming model, allowing interactive previewing on both single and multiple NVIDIA GPU platforms.</p> <p>iray balances intuitive ease of use and scene setup with the highest quality photorealistic final frame output and interactive performance.</p> <p>iray is provided with mental ray from version 3.8 and RealityServer from version 3.0. In addition, it will be released with a forthcoming version of SceniX™ from NVIDIA.</p>
<p>2. What are iray products?</p>	<p>iray-enabled products feature an <i>iray rendering mode</i>. To date, these are:</p> <ul style="list-style-type: none"> <li>• mental ray® 3.8 (available since November 2009)</li> <li>• neuray 3.0 (available for Independent Software Developers (ISVs) to integrate into their own products, both final frame and interactive).</li> <li>• RealityServer® 3.0 (available since November 2009)</li> <li>• SceniX™ (details and release date to be announced)</li> </ul>
<p>3. Who needs iray?</p>	<p>iray should be considered if you</p> <ul style="list-style-type: none"> <li>• require “push-button” renderer of final frame photorealistic images with correct global illumination;</li> <li>• require photorealistic results in a progressive and interactive manner;</li> <li>• prefer a solution that requires only a small number of intuitive settings;</li> <li>• want to assign realistic materials to 3D objects, or use pre-defined libraries of physically correct materials</li> <li>• want to simulate real world lighting</li> <li>• want to leverage the cost/performance benefits of GPUs for high-quality rendering</li> </ul> <p>ISVs looking for an integrated rendering solution benefit from well</p>

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	<p>documented API, ease of integration, and custom support from mental images, a company with 20+ years of experience in providing component software and supporting ISVs.</p>
<p>4. Which application use cases benefit most from iray?</p>	<p>Use cases well suited for iray include:</p> <ul style="list-style-type: none"> <li>• Architectural visualization</li> <li>• Automotive styling and marketing visualization</li> <li>• Engineering and CAD (styling &amp; design)</li> <li>• Product styling and marketing visualization.</li> <li>• Consumer device design visualization.</li> </ul> <p>mental images would be pleased to review potential other use cases and specific integration requirements. Please contact <a href="mailto:sales@mental.com">sales@mental.com</a>.</p>
<p>5. How does iray work?</p>	<p>iray generates photorealistic imagery without introducing rendering algorithm specific artifacts, and without requiring the use of renderer specific parameterizations. iray progressively refines the image until maximum fine detail is reached, providing a single process which smoothly combines interactive pre-visualization and final frame rendering.</p> <p>When coupled with NVIDIA GPUs, iray can produce final frame photorealistic images in a progressive manner, with changes displayed at interactive frame rates. This fundamentally changes the paradigm for how artists and content developers work with rendering tools to produce high-quality photorealistic imagery.</p> <p><i>For technical audiences:</i></p> <p>Interpolation techniques, which trade final quality, predictability, and simplicity of scene specification for performance, form the core of most current global illumination renderers. Unlike them, iray rendering is based on deterministic and consistent global illumination simulation algorithms that converge without introducing persistent approximation artifacts.</p>
<p>6. What shading does iray use?</p>	<p>iray uses a highly optimized BSDF and EDF shading framework (essentially, simulating the physical behavior of real-world materials and light sources), as opposed to a complex collection of programmable shaders applied through renderer specific object and scene parameters.</p> <p>iray supports the most common “physical” materials, beginning with the mia_materials shaders (aka Arch and Design materials and Pro Materials in 3DS Max, and mia_material and mia_material_x in Maya) and associated texture shading graphs that are already in heavy use by mental ray users.</p> <p>Lighting support in iray includes HDR environment maps, spot, point,</p>

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	and directional lights. IES profile lights are also supported.
7. How does iray perform compared to mental ray and other renderers?	Rendering performance is always heavily dependent on scene content and complexity, so it is not possible to give a general answer to this type of question. However, when coupled with a modern NVIDIA GPU, iray should be able to produce renderings with a heavy emphasis on full global illumination and subtle light effects substantially faster than the current mental ray software renderer executing on a single desktop configuration. In cases where general global illumination effects are not required, the current mental ray software rendering mode may continue to be faster and more flexible.
8. Will iray be provided by OEMs that ship mental ray today?	<p>iray will be available to mental images’s OEM partners and we expect that they will make it available in their applications in accordance with their own release plans.</p> <p>Please visit <a href="http://www.mentalimages.com/iray">www.mentalimages.com/iray</a> for up-to-date information on supported products.</p>
9. Will iray be available without mental ray?	iray will be available in the form of a separate developer library for integration into OEM products as required by existing and new OEM customers of mental images.
10. What hardware is required to run iray-enabled applications?	<p>The exact GPU hardware specifications vary with content and application requirements and CUDA-enabled GPUs will be required for high performance. While all CUDA-enabled GPUs are supported, iray’s memory requirements will make NVIDIA Quadro®, QuadroPlex® and Tesla® systems for workstations as well as Tesla server units the platforms of choice in most situations.</p> <p>Early tests on NVIDIA’s next-generation GPU architecture (Fermi) are demonstrating a performance speedup of at least 2x vs. comparable current systems. More details will be provided when they become available.</p>
11. What does iray not do?	iray is <i>not</i> intended as an interactive preview-mode for mental ray and it is <i>not</i> a real time ray tracer (RTRT). iray allows for an interactive scene navigation mode utilizing fast but necessarily approximate interim calculation of the images.
12. Why is iray not real-time?	<p>All current “real-time” ray tracers have to compromise when it comes to true global illumination effects, physical correctness, or accuracy. Their main requirement is to generate finally rendered frames at rates of 24 to 60 fps and above. They achieve this by either omitting global illumination effects or by approximating them, and compromising in various other areas. While such approximations and omissions are necessary, they are often tolerated by current applications requiring real-time ray tracing.</p> <p>iray is intended and optimized for the many other applications where true global illumination, highest final image quality, and physical</p>

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	correctness are required. iray is an interactive and progressive global illumination renderer, not a slow real-time ray tracer.
13. Who would still need the other rendering modes of mental ray?	If you need traditional CG techniques, if you require the flexibility of fully programmable and customizable shaders; if you need to render non-photorealistic imagery and/or custom-tune every aspect of the rendering process, then mental ray is for you, which is now more productive than ever thanks to the MetaSL technology.
14. Are iray and mental ray two different products?	No. iray is a GPU accelerated photorealistic rendering technology offered <i>as a rendering mode of</i> mental ray 3.8, neuray 3.0, and RealityServer 3.0.
15. Will products with iray run on NVIDIA GPUs only?	While iray requires NVIDIA GPUs for interaction and high-performance, products such as mental ray with iray and neuray with iray will continue to support all platforms that our customers require and for which their developers see a sufficient market.
16. Does iray also work without CUDA hardware?	When running on a system that lacks compatible NVIDIA GPU resources, iray operates as a CPU-based renderer, albeit significantly slower. iray can also operate in a “hybrid GPU/CPU mode” where it can utilize any collection of local GPU and CPU resources to compute a single image.
17. How can I get iray?	iray has been released as a rendering mode of mental ray 3.8, neuray 3.0, and RealityServer 3.0. Details of availability as well as support by OEM packages that integrate mental ray are available from <a href="http://www.mentalimages.com/iray">www.mentalimages.com/iray</a> .
18. Who will provide support for iray?	mental images has extensive support offerings for OEM software vendors who incorporate iray into their products (and 20+ years of experience in working with them).
19. Does iray run on GeForce and Tesla?	iray in neuray and iray in mental ray support GeForce and Tesla. iray in RealityServer only supports Tesla.
20. Does iray run on non-NVIDIA GPUs?	No.
21. Will there be an OpenCL version of iray?	There currently are no plans for supporting OpenCL.
22. Will there be a CPU-only version of iray?	iray can operate in a “hybrid GPU/CPU mode” where it can utilize any collection of local GPU and CPU resources to compute a single image. It will work on CPU only systems, although CUDA compatible GPUs are necessary to achieve the highest performance and responsiveness.
23. Can iray scale across multiple GPUs?	iray rendering can be accelerated by using multiple GPUs in one machine.

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24. Can I utilize multiple machines with iray (cluster)?	When using neuray and RealityServer, multiple computers can be grouped in a cluster and the GPUs in the cluster will be leveraged to accelerate the iray rendering.
25. Can iray have an “offline” mode for resolutions I can’t display?	Yes, offline rendering for large images is a feature of both mental ray and RealityServer.
26. Does iray support depth of field and motion blur?	iray Version 1 supports depth of field, but does not support motion blur.
27. Does iray support higher order surfaces (i.e, direction, without tessellation)?	<p>iray version 1 only supports directly supports tessellated geometry. Some non-tessellated geometries are supported in the mental ray APIs, which are converted into tessellated geometries for use in the iray rendering mode.</p> <p>RealityServer and, to some extent, neuray include support for Nurbs and Free Form Surfaces, which are also converted into tessellated geometries for use in the iray rendering mode. For more details please refer to the respective product manuals.</p>
28. Can I preview the results in mental mill?	<p>iray rendering mode does <i>not</i>, in version 1, support customer MetaSL shaders, in the sense of programmable shaders, but mental mill can be used to wire up shader graphs which include mia_materials and the Arch_Comp BSDF nodes, and export them to a structure that iray can render in both mental ray and RealityServer.</p> <p>mental ray 3.8, which is iray enabled, will be integrated into mental mill.</p>
29. Does SceniX (formerly NVSG) support MetaSL?	Yes, SceniX has integrated MetaSL support.
30. How is OptiX (formerly NVIRT) positioned vs. mental ray and iray?	<p>Unlike iray, which is a ready-to-use rendering component, OptiX is a programmable, low-level raytracing pipeline for building or accelerating renderers.</p> <p>iray is a new rendering mode of mental ray and RealityServer. Both mental ray and RealityServer (and the iray Integrator Edition) are complete rendering solutions for OEM product integration and standalone deployment.</p>
31. What does “interactive” mean?	iray progressively refines a frame until maximum fine detail is reached, with physically correct accuracy. At any time during this progressive process, the user may modify certain scene elements (i.e. the camera’s position) - prompting the system to interactively begin a new frame. By avoiding compromises and approximations and using the power of CUDA based GPUs, iray allows interactive experiences in application contexts that require physically correct final frame accuracy but would

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	previously only have worked in a “batch” mode and taken an excessive amount of time.
32. What does “physically correct” mean?	The process of rendering frames involves a simulation of real-world physical laws such as the behavior of light and the mediums with which it interacts. Traditional ray tracing solutions usually make use of approximations, to various degrees, which means that their output is <i>not</i> generally physically correct.

For more information contact [sales@mental.com](mailto:sales@mental.com).