

# High Level Milestones

## High Level Milestones

Milestones	JIRA ID	Owner	Target Completion	Comments
Primitive rendering		Oracle /JetBrains		Implementation is done
Image rendering		JetBrains		Implementation is done (except for Bicubic interpolation - for which SW rendering fallback exists)
Text rendering		Oracle		Implementation is done
1st early access (EA-1)		Oracle /JetBrains	15 May 2020	Released
Stabilization and bug fixing		Oracle /JetBrains		
IDE performance Testing		Oracle /JetBrains		Done
Execute JTREG tests and match current passrate		Oracle		Done
Pass all JCK tests		Oracle		Done
Functional complete with performance		Oracle /JetBrains		Done
2D Alias Review		Oracle /JetBrains	4 Feb 2021	Done. Link to JEP code review - <a href="https://github.com/openjdk/jdk/pull/2403">https://github.com/openjdk/jdk/pull/2403</a>
Integration to openjdk/jdk		Oracle	15 Mar 2021	Done

## Task List

All active issues (including tasks, subtasks and bugs) in Lanai project can be accessed with JBS filter : <https://bugs.openjdk.java.net/issues/?filter=37832>

## Early Access Release History

Early Access Release	Date	Contents
EA-1	15 May 2020	First EA release
EA-2	19 Jun 2020	Fixes on top of EA-1 <ul style="list-style-type: none"><li>8247464: Memory Leak in MTLBlitLoops_CopyArea() method</li><li>8247304: Use separate MTLCommandQueue for final blit and MTLDrawable</li><li>8246495: Lanai: update AA clip info on GPU via compute shader</li><li>8246454: Lanai: Create RenderPerf tests for rectangular and shape clips</li><li>8242952: fixed MTLBlitLoops::replaceTextureRegion (add correct offset)</li><li>8242354: support for bufImgOps (RescaleOp, LookupOp, ConvolveOp)</li><li>8246331: Lanai: do not update AA clip info in nonAA mode</li><li>8246239: Revert JDK-8244193 as it causes performance regression</li></ul>
EA-3	10 Jul 2020	Fixes on top of EA-2 <ul style="list-style-type: none"><li>8242950: Files which can't be selected has different color with metal than opengl in JFileChooser</li><li>8247772: Lanai: Several jtreg tests fails with assertion validateTextureDimensions: 759: failed assertion 'MTLTextureDescriptor has width greater than maximum allowed size of 16384'</li><li>8248301: Lanai - Change MTLStorageMode of MTLSurfaceData texture (render backbuffer) to private</li></ul>

EA-4	08 Aug 2020	<p>Fixes on top of EA-3</p> <ul style="list-style-type: none"> <li>• 8233226: Implement XOR Mode rendering option</li> <li>• 8247564: Lanai - SwingSet2 - Motif LF - UI controls border is incorrectly drawn with uiScale=1.0</li> <li>• 8244402: Lanai - Motif L&amp;F - Non selected Radio button is barely rendered on non-retina display</li> <li>• 8248831: Lanai : SwingSet2Demo Input dialog is not proper for MetallLookAndFeel with default non-retina display</li> <li>• 8240221: XOR mode rendering option does not work with Texture paint and Gradient Paint</li> <li>• 8247556: Lanai : J2DDemo - ImageOps demo - Few options are not working...</li> <li>• 8247831: Clamp texture height to maxTextureSize(16384)</li> <li>• 8249174: Fix improper glyph cache initialization logic for text rende...</li> <li>• 8243953: Optimize encoder creation/deletion logic for LCD text rendering</li> </ul>
EA-5	18 Sep 2020	<p>Fixes on top of EA-4</p> <ul style="list-style-type: none"> <li>• 8252845: Regressions in Sanity tests after JDK-8251032</li> <li>• 8252798: Cleanup LCD text rendering code</li> <li>• 8252386: Lanai: Implement RadialGradientPaint in shader</li> <li>• 8252706: Enable usage of rowBytesOffset for LCD non cache rendering</li> <li>• 8251032: Colors with texture background look different with Alpha Com...</li> <li>• 8252385: Lanai: Implement LinearGradient paint in shader</li> <li>• 8243547: Lanai - Netbeans IDE has BLACK background for the Toolbar and Statusbar</li> <li>• 8240164: Test java/awt/Window/TranslucentShapedFrameTest/TranslucentShapedFrameTest.java fails for metal</li> <li>• 8240074: Test java/awt/Window/TranslucentJAppletTest/TranslucentJAppletTest.java fails for metal</li> <li>• 8251027: DrawString with TexturePaint is corrupted</li> <li>• 8242920: Gradient Paint doesn't work with metal</li> <li>• 8252371: LCD text rendered with Metal pipeline is corrupted</li> <li>• 8252217: Crash in metal pipeline which running J2DBench test</li> <li>• 8252057: Crash in metal pipeline when dragging any Swing app to other...</li> <li>• 8251484: Performace drop in FlatBoxAA renderperf test for metal pipeline</li> <li>• 8251242: Tile based rendering results in artifacts in last column while using metal pipeline</li> <li>• 8249659: [Lanai] Crash while running RenderPerfTest with metal pipeli...</li> <li>• 8251167: Drawing polyline twice in XOR mode leaves out some traces on screen (only with uiScale=1.0)</li> </ul>
EA-6	08-Oct-2020	<p>Fixes on top of EA-5</p> <ul style="list-style-type: none"> <li>• 8253931: Lanai: MTLTexturePool refactoring</li> <li>• 8253840: Lanai - MTLClip.beginShapeClip method uses a larger temporary buffer than needed</li> <li>• 8252790: Lanai: Refactor RenderPerfTest to run single test by name</li> <li>• 8253657: Lanai: Refactor MTLTexturePool - getTexture</li> <li>• 8251475: sun/java2d/pipe/hw/RSLAPITest/RSLAPITest.java fails with metal pipeline</li> <li>• 8246194: Performance of Mix.Balls decreases when Rendering Quality option is Selected</li> <li>• 8252796: Lanai: Shape clip test artifacts on MacBook Air 2020</li> <li>• 8252499: UI text of application with metal pipeline is lost when another application is launched with OpenGL pipeline</li> <li>• 8253301: Lanai: Memory leak in MTLContext code</li> <li>• 8253260: Fix whitespace errors in .m and .metal files in lanai repo</li> <li>• 8252795: Lanai: Refactor native implementation of MTLPaint</li> <li>• 8251023: Clipping of Image doesnt work when Alpha composite is enabled in J2DDemo</li> <li>• 8252880: Image operations are not working with metal</li> <li>• 8252895: Black background in SwingSet2 in Nimbus LAF</li> <li>• 8252949: Shape clip should use identity transform for drawing clip spans</li> </ul>
EA-7	18-Nov-2020	<p>Fixes on top of EA-6</p> <ul style="list-style-type: none"> <li>• 8256331: Lanai: DrawImage/IncorrectAlphaSurface2SW fails</li> <li>• 8252954: Lanai : java/awt/datatransfer/DataFlavor/DataFlavorRemoteTest.java fails</li> <li>• 8252951: Lanai : java/awt/Robot/NonEmptyErrorStream.java fails</li> <li>• 8251033: Background texture is not visible when Alpha Composite is enabled</li> <li>• 8238533: [Lanai] Support texture paint where source is transparent</li> <li>• 8248129: Swingmark numbers are not good for Nimbus LAF</li> <li>• 8255212: J2DDemo : Rectangle in Texture paint disappears if we enable AA</li> <li>• 8255149: Lanai: DrawImage/IncorrectAlphaConversionBicubic.java failure</li> <li>• 8244718: J2DDemo - AlphaComposite tab - output colors are different with AA &amp; non-AA</li> <li>• 8254881: Commit commandbuffer after draw happens through JNI</li> <li>• 8254879: Implement JNI path for Draw Poly</li> <li>• 8254869: Refactor check_previous_op usage in Mask Fill</li> <li>• 8244845: Lanai : J2DDemo - Clipping - Two parallel lines do not appear with AA Rendering</li> <li>• 8242924: Selection is not correct in Paint.TextureAnim</li> <li>• 8253994: J2DDemo: Buttcap, SquareCap color is different in AlphaComposite mode</li> <li>• 8252726: Lanai: IDEA Editor Rendering OGL vs Metal 1:2</li> <li>• 8254176: Lanai: MTLTexturePool optimize lookup of expired textures</li> </ul>

EA-8	17-Dec-2020	<p>Fixes on top of EA-7</p> <ul style="list-style-type: none"> <li>• 8257886: Build issue in macOS 10.14</li> <li>• 8256683: Lanai: NetBeans IDE - AA Text rendering appears brighter compared to OpenGL</li> <li>• 8242925: J2DDemo - Anti-Aliasing with Metal differs from OGL</li> <li>• 8257618: Lanai: GradientPaint interpolates over stops limits</li> <li>• 8257566: Lanai: System runs out of application memory while running the Unmanaged_BufferedImage_draw_NearestNeighbor test multiple times</li> <li>• 8257441: Lanai: java/awt/image/VolatileImage/DrawHugeImageTest fails</li> <li>• 8257442: Lanai: Create RenderPerf tests for SW to HW blits</li> <li>• 8257413: Lanai - Use optimum sized temporary buffer while replacing texture region</li> <li>• 8238285: Lanai: java/awt/image/DrawImage tests fail</li> <li>• 8256576: DrawImage/BlitRotateClippedArea fails</li> </ul>
EA-9	26-Jan-2021	<p>Fixes on top of EA-8</p> <ul style="list-style-type: none"> <li>• 8258658: Print log that metal pipeline is enabled when -Dsun.java2d.metal=True is set</li> <li>• 8260000: Remove JNF_COCOA_ENTER/EXIT usage from MTLGraphicsConfig.m</li> <li>• 8258754: Gracefully fallback to the OpenGL rendering pipeline if Metal rendering pipeline initialization fails</li> <li>• 8259853: Lanai: nonAA Gradient painting is not precise for VI</li> <li>• 8259939: Remove JNF_COCOA_ENTER/EXIT usage from Lanai project</li> <li>• 8258202: Lanai: Buffered image loses its shape after clicking on Alpha Composite option</li> <li>• 8258202: Lanai: Buffered image loses its shape after clicking on Alpha Composite option</li> <li>• 8252950: Lanai : sun/java2d/DirectX/OpaqueImageToSurfaceBlitTest/OpaqueImageToSurfaceBlitTest.java fails</li> <li>• 8259653: Multistop gradients incorrectly works with non uniform stops</li> <li>• 8245256: Cleanup OpenGL references in Metal documentation</li> <li>• 8259341: Remove useage of JNFCallVoidMethod from Metal.</li> <li>• 8259038: Stop CVDisplayLink when there is no active rendering</li> <li>• 8247332: Checkbox reaches inconsistent state on tap to click</li> <li>• 8251477: java/awt/Frame/MiscUndecorated/RepaintTest.java fails with metal pipeline</li> <li>• 8247739: Lanai : SwingSet2Demo -More than one radio button can be selected the same time</li> <li>• 8252501: Sometimes more than one menu items are shown as highlighted on hover</li> <li>• 8242187: Lanai - JCheckBox and JRadioButton can get into inconsitent visual state – but recover on window refresh</li> <li>• 8252907: Motif L&amp;F - SwingSet2 - Two Toolbar buttons are shown as selected</li> <li>• 8258482: Lanai: reduce data for shape clip using bounding box</li> <li>• 8258257: Lanai: optimize stencil texture clear code</li> </ul>

EA-10

03-Mar-2021

Fixes on top of EA-9

- 8262750: Crash in J2DDemo after multiple plug/unplug of monitor
- 8262729: Cleanup OpenGL references from Metal implementation
- 8262496: Lanai: Do not use resources of off-line MTLDevice
- 8262313: Override stencilAttachmentPixelFormat to maintain appropriate state
- 8262293: Remove redundant end of encoder for AAShader rendering
- 8261891: sanity/client/SwingSet/src/EditorPaneDemoTest.java fails with Metal API Validation
- 8262115: Crash on graphics card switch when Metal API validation enabled
- 8262091: Add RenderPerfTest for XOR mode rendering
- 8261646: Crash in MTLBlitLoops when Metal API Validation enabled
- 8261960: replaceTextureRegion throws error when Metal API validation is enabled
- 8260715: Lanai: MTLGraphicsConfig.m \_getMTLConfigInfo optimization
- 8261703: Many java/awt/ tests fail with Metal API Validation Stencil PixelFormat error
- 8261908: DrawScanline vertex calculation is not proper
- 8261734: Some jtreg tests are failing with invalid setRectClip
- 8261789: Add bounds check to MTLBlitLoops CopyArea method
- 8261705: Swing jtreg tests fail Metal API Validation with missing buffer binding
- 8261706: Swing test fails Metal API Validation with setVertexBytes error
- 8261712: Lanai: Crash in MTLClip when Metal API Validation enabled
- 8261704: Many java/awt/ tests fail with Metal API Validation synchronizeTexture error
- 8261638: Lanai: crash in Clipping tab of J2Demo
- 8261632: Cached text AA rendering crashes with Metal API validation
- 8261620: Running metal with API validation crashes immediately
- 8261547: Minor memory leak reported for Metal Rendering pipeline
- 8261143: Code in MTLGraphicsConfig.m can use ThreadUtilities performOnMainThreadWaiting:YES block:^()
- 8261546: Cleanup deadcode in MTLBlitLoops
- 8261402: Verify whether we need ContextCaps in metal
- 8261273: RenderPerf test files should have GPL license without Classpath exception
- 8261430: Remove redundant #ifndef HEADLESS checks from metal native code
- 8261399: Cleanup code based on code review comments
- 8261304: Clean up anomalies identified in code review comments
- 8261234: Lanai build fails due to leftover import of JavaNativeFoundation.h
- 8261134: Remove additional blank lines at EOF
- 8260857: Remove JNFWeakJObjectWrapper from Lanai Project
- 8260711: Lanai: Refactor MTLContext, MTLGraphicsConfig, MTLSurfaceData
- 8260706: Minor cleanup - CGLGraphicsConfig.java and MTLBlitLoops.m
- 8260681: Lanai: Refactor MTLBlitLoops.m, common.h, shaders.metal
- 8260672: Lanai: refactor MTLBlitLoops, MTLLayer, MTLSurfaceData
- 8260651: Build fails after fix for JDK-8260640
- 8254868: Remove additional logging added under JDK-8229819
- 8260640: Cleanup dead code and comments imported from OpenGL
- 8260553: Lanai: pipeline substates use while loop for resize
- 8260582: Clean up MacOSFlags implementation
- 8260578: Replace wildcard imports with specific ones
- 8260554: Missing copyright headers on some Lanai files
- 8260247: Move RenderPerfTest from demo to test directory
- 8252952: Lanai: VolatileImage/BitmaskVolatileImage test fails