



Open CASCADE Technology and Products ver. 6.7.1

Release Notes

Overview

Open CASCADE Technology and Products version 6.7.1 is a maintenance release, which includes about **130** improvements and bug fixes over the previous release 6.7.0.

Version 6.7.1 is binary incompatible with the previous versions of Open CASCADE Technology and Products, so applications linked against a previous version must be recompiled to run with this Version 6.7.1.

Highlights

- ➔ Numerous bug fixes and improvements in Modeling Algorithms, Visualization, Data Exchange;
- ➔ Parallelization of the Building and (partially) Intersection parts of Boolean algorithms;
- ➔ Additional tools and documentation on debugging OCCT code;
- ➔ Support of SVG images in documentation;
- ➔ Generation of Reference Manual documentation by `gendoc` command (without WOK);
- ➔ Class for display of shape with different colors of sub-shapes;
- ➔ Porting of Samples to Qt 5.



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Modifications

Foundation Classes

23427	<p><i>Summary:</i> Unused C-sources in <code>OSD</code> package</p> <p>Unused files with extension <code>.c</code> have been replaced by the corresponding <code>.cxx</code> files and removed from package <code>OSD</code>.</p>
24438	<p><i>Summary:</i> Provide customized status descriptions in <code>Message_Algorithm</code></p> <p>New method <code>Message_Algorithm::SetStatus()</code>, which takes <code>Message_Msg</code> as argument, has been introduced to support fully customized status messages. Such messages completely override the text and parameters specified in other ways.</p>
24489	<p><i>Summary:</i> Avoid type casts in call to <code>Standard::Free()</code></p> <p>Method <code>Standard::Free()</code> has been converted to template, so the pointer is nullified using its proper type.</p> <p>Unnecessary type casts in calls to <code>Standard::Free()</code>, <code>Standard::Reallocate()</code>, and <code>NCollection_BaseAllocator::Free()</code> have been eliminated throughout OCCT code.</p>
24603	<p><i>Summary:</i> The code of <code>TCollection_AsciiString::Search*</code> methods can be simplified</p> <p>Unnecessary use of Boolean flags has been avoided in some <code>TCollection_AsciiString::Search*</code> methods.</p>
24701	<p><i>Summary:</i> Drop redundant headers</p> <p>Obsolete headers <code>Standard_ctype.hxx</code> and <code>Standard_inverse.h</code> have been removed.</p>

Application Framework

24535	<p><i>Summary:</i> Bad type cast in <code>TDocStd_Document::Update()</code></p> <p>GCC compiler warning on breakage of C pointer aliasing rules has been eliminated in method <code>TDocStd_Document::Update()</code>.</p>
24565	<p><i>Summary:</i> <code>MgtBRep</code> persistence bug</p> <p>The method <code>MgtBRep_TranslateTool::UpdateEdge</code> has been corrected to take into account edges with null 3d curve representation.</p>
24645	<p><i>Summary:</i> Pointer to the last is wrong for a tree node</p> <p>The method <code>TDataStd_TreeNode::Remove()</code> has been corrected to not lose the last child tree node on removal (detach) operation.</p>
24666	<p><i>Summary:</i> Removal of output information in debug mode in OCAF</p> <p>Specific pre-processor macro <code>DEB_BUILDER</code> is now used instead of <code>DEB</code> to eliminate extra output on setting a shape to a label.</p>

Modeling Data

24474	<p><i>Summary:</i> <code>GCPnts_AbscissaPoint</code> calculates invalid point</p> <p><code>GCPnts_AbscissaPoint</code> algorithm has been corrected. New command <code>discrCurve</code> has been added to test <code>GCPnts_UniformAbscissa</code> by count of discretization point.</p>
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Modeling Algorithms

23855	<p><i>Summary:</i> Old BOPs fail on Win7 64bit when using TBB</p> <p>Casts of pointers to long integer, which fail on 64-bit platforms, have been fixed in class <code>TopOpeBRep_sort</code>.</p>
23884	<p><i>Summary:</i> Boolean Fuse between two faces fails</p> <p>The procedure <code>CheckPCurve</code>, which checks P-Curves obtained after approximation, has been extended to take into account the inner structure of P-Curve [<code>NbIntervals</code>] in method <code>IntTools_FaceFace::MakeCurve</code>.</p>
23892	<p><i>Summary:</i> Missing intersection edge between two faces</p> <p>The start points are manifolded on the boundaries of periodic surfaces in method <code>IntPatch_PrmPrmIntersection::Perform</code>, which allows correctly finding the edge of intersection between two faces.</p>



<p>24157</p>	<p><i>Summary:</i> Parallelization of assembly part of Boolean Operations</p> <p>The Building (Assembly) part of Boolean Operations has been parallelized. Among others, this concerns such extremely time-consuming operations as Building Faces and Building Edges.</p> <p>The following modifications have been introduced to manage parallelization:</p> <ul style="list-style-type: none"> ▪ New method <code>BOPAlgo::SetRunParallel</code> allows setting the flag of parallel processing: if <code><theFlag></code> is <code>true</code> it is switched on and if <code><theFlag></code> is <code>false</code> it is switched off. ▪ <code>BOPAlgo::RunParallel</code> returns the flag of parallel processing. ▪ Draw command <code>bbuild</code> now works in parallelized mode by default, but can be used with option <code>-s</code> in sequential mode. ▪ Auxiliary classes <code>BOPAlgo_BuilderSolidFunction</code> and <code>BOPAlgo_BuilderSolidCnt</code> provide the interface and implementation of the parallel computations. ▪ Parallel execution of the <code>WireSplitter</code> algorithm has been provided in method <code>BOPAlgo_BuilderFace::PerformLoops()</code>. ▪ Parallel execution of the <code>SplitBlock</code> algorithm has been provided in method <code>BOPAlgo_WireSplitter::MakeWires()</code>. <p>Other new features have been implemented in the frame of this issue:</p> <ul style="list-style-type: none"> ▪ New class <code>BOPAlgo_ShellSplitter</code> provides splitting of a set of connected faces into separate loops ▪ New class <code>BOPCol_BoxBndTree</code> provides instantiation of the algorithm of unbalanced binary tree of overlapped 3D bounding boxes. ▪ New class <code>BOPCol_Box2DBndTree</code> provides instantiation of the algorithm of unbalanced binary tree of overlapped 2D bounding boxes.
<p>24204</p>	<p><i>Summary:</i> <code>BRepOffsetAPI_MakePipeShell</code> algorithm produces a resulting shape with unwarrantably big tolerance</p> <p><code>BRepFill_Sweep::BuildShell</code> method has been modified to construct the first and the last V-iso-edges in the same way as other V-iso-edges.</p>
<p>24208</p>	<p><i>Summary:</i> Optimization of the edge-edge and edge-face intersection algorithms</p> <p>New Edge/Edge intersection algorithm based on the intersection between bounding boxes of edges has been implemented in <code>IntTools_EdgeEdge</code> class.</p> <p>The obsolete class <code>IntTools_BeanBeanIntersection</code> has been removed.</p>
<p>24427</p>	<p><i>Summary:</i> Wrong section curves</p> <p>The application of <code>DecomposeResult</code> method from <code>IntPatch_ImpPrmIntersection</code> class has been restricted by the cases when the intersection curve contains the parts where U-parameter on quadric surface changes too sharply.</p>
<p>24463</p>	<p><i>Summary:</i> <code>BRepAlgo_Section::Build</code> hangs</p> <p>The method <code>BRepTools::AddUVBounds</code> has been corrected to avoid hanging on faulty faces.</p>





<p>24470</p>	<p><i>Summary:</i> Wrong result done by General Fuse algorithm</p> <p>The General Fuse algorithm has been improved.</p> <p>The intersection between a Torus surface and a Plane, Cylinder, Sphere, Cone or Torus surface is processed as analytical in the following cases:</p> <ul style="list-style-type: none"> ▪ Torus and Plane: a) their surface axes are parallel or b) their surface axes are perpendicular and the location of the Torus lies on the Plane; ▪ Torus and Sphere: the location of the Sphere lies on the axis of the Torus; ▪ Torus and Cone, Cylinder or Torus: the axes of the surfaces are collinear. <p>In all cases the resulting intersection line is a circle.</p> <p>The intersection between the torus whose minor radius is more than or equal to the major radius and any other surface is considered as parametric.</p> <p>The validity of the intersection point between an edge and a face is checked using the sum of their tolerance values.</p>
<p>24472</p>	<p><i>Summary:</i> Wrong section curves</p> <p>The following changes have been introduced to improve intersection algorithm results:</p> <ul style="list-style-type: none"> ▪ The check if the intersection curve is collapsed has been added in method <code>GeomInt_LineConstructor::Perform</code>. ▪ It is also checked in the same method if the first and the last points of every interval of the intersection line belong to both intersecting surfaces (previously only the midpoint of the interval was checked, which was error-prone). ▪ The method <code>IntPatch_PrmPrmIntersection::Perform</code> has been modified to allow adding new points in the found intersection line. Additional points are found by new <code>IntWalk_PWalking::SeekAdditionalPoint()</code> method that can use auxiliary methods <code>::DistanceMinimizeByExtrema</code> and <code>::DistanceMinimizeByGradient</code>.
<p>24475</p>	<p><i>Summary:</i> Wrong result of ThruSections algorithm on two wires</p> <p>The regression that made the loft between two wires twisted has been corrected in <code>BrepFill_CompatibleWires::ComputeOrigin</code> method.</p>
<p>24481</p>	<p><i>Summary:</i> Test "Perform Infinite Point" provides a wrong result for a solid</p> <p>The method <code>BRepClass3d_SClassifier::PerformInfinitePoint</code> has been rewritten: a normal to the first extracted face is taken in a random inner point and this reversed normal is intersected with the faces of the solid.</p> <p>Additional argument check has been introduced in method <code>BRepClass3d_SolidExplorer::FindAPointInTheFace</code>.</p>
<p>24484</p>	<p><i>Summary:</i> SGProps gives incorrect matrix of inertia and moments</p> <p>Modifications have been introduced in <code>GProp_SGProps</code> class to correctly compute matrix of inertia and moments.</p>





<p>24491</p>	<p><i>Summary:</i> Partition algorithm history bug</p> <p>The information submitted in the log of Partition operation has been modified in the following aspects:</p> <ul style="list-style-type: none"> ▪ All splits of the shape are returned as Modified from that shape; ▪ Section edges (in case of section operation) are returned as Generated from the face. <p>The corresponding changes have been introduced in <code>BOPAl go_BOP</code> and <code>BOPAl go_Bui l der</code> classes.</p>
<p>24492</p>	<p><i>Summary:</i> The command <code>bopargcheck</code> produces wrong results.</p> <p>The following improvements have been introduced in the command <code>bopargcheck</code>:</p> <ul style="list-style-type: none"> ▪ Classes <code>BOPDS_InterfVZ</code>, <code>BOPDS_InterfEZ</code>, <code>BOPDS_InterfFZ</code> and <code>BOPDS_InterfZZ</code> have been introduced to store the information about interferences of vertex/solid, edge/solid, face/solid and solid/solid type correspondingly. ▪ Methods <code>BOPDS_DS::InterfVZ()</code>, <code>BOPDS_DS::InterfEZ()</code>, <code>BOPDS_DS::InterfFZ()</code> and <code>BOPDS_DS::InterfZZ()</code> have been introduced to return collections of Vertex/Solid, Edge/Solid, Face/Solid and Solid/Solid interferences correspondingly. ▪ New <code>BOPDS_DS::NbInterfTypes()</code> method returns the number of interference types. ▪ Methods <code>BOPDS_Tools::IsInterfering()</code> and <code>BOPDS_ShapeInfo::IsInterfering()</code> return true if the type can be participant of an interference. ▪ Methods <code>BOPAl go_CheckerSI::PerformVZ()</code>, <code>BOPAl go_CheckerSI::PerformEZ()</code>, <code>BOPAl go_CheckerSI::PerformFZ()</code> and <code>BOPAl go_CheckerSI::PerformZZ()</code> allow computing Vertex/Solid, Edge/Solid, Face/Solid and Solid/Solid interferences correspondingly. ▪ Method <code>BOPDS_DS::HasInterfShapeSubShapes(theI1, theI2, theFlag)</code> now returns true if shape <code>theI1</code> is interfered with at least one sub-shape of shape <code>theI2</code> (if <code>theFlag=true</code>) or all sub-shapes of shape <code>theI2</code> (if <code>theFlag=false</code>). ▪ Methods <code>BOPDS_IteratorSI::Intersect()</code>, <code>BOPDS_Tools::TypeToInteger</code>, <code>BOPAl go_CheckerSI::Perform()</code>, <code>BOPAl go_CheckerSI::PostTreat()</code> and <code>BOPAl go_ArgumentAnalyzer::TestSelfInterferences()</code> have been improved to process interferences with solids.
<p>24495</p>	<p><i>Summary:</i> Crash during Boolean operation for Windows VC2010 64 bit</p> <p>Recursion has been replaced with cycle in method <code>BOPAl go_Wi reSpl i tter::Path</code>.</p>
<p>24505</p>	<p><i>Summary:</i> Wrong section curves between Cone and Cylinder with collinear axes</p> <p>The method <code>IntPatch_Intersection::Perform</code> has been modified to process intersection between a Cone and a Cylinder, Sphere, Cone or Torus surface as analytical when the surface axes are collinear.</p>





24532	<p><i>Summary:</i> <code>BRepOffsetAPI_MakePipeShell</code> raises an exception in the case with an auxiliary guide line</p> <p>The method <code>BRepFill_CompatibleWires::PlaneOfWire</code> has been protected against possible null curve.</p>
24558	<p><i>Summary:</i> Boolean operation cannot create all solids, which should be built</p> <p>The algorithm of checking 2D distances when splitting wires has been corrected in method <code>BOPAlgo_WireSplitter::Path</code>.</p>
24573	<p><i>Summary:</i> Wrong result of 2D offset algorithm on a shape</p> <p>New method <code>GccAna_CircPnt2dBisec::Create(Circle1, Point2)</code> has been implemented to construct bisecting curves between a circle and a point.</p>
24575	<p><i>Summary:</i> Exception is raised during checkshape operation.</p> <p>Recursion calling <code>BrepCheck_Shell::Propagate()</code> function has been replaced with a cycle.</p>
24585	<p><i>Summary:</i> Wrong pcurve of the section curve</p> <p>The p-curve obtained by <code>IntPatch_PrmPrmIntersection::Perform</code> as the intersection line is now forcefully extended to the surface boundary by appending points using <code>IntWalk_PWalking::PutToBoundary()</code> method.</p> <p>In DRAW, <code>bopcurves</code> command now returns the number of found 3D and (optionally) 2D curves.</p>
24586	<p><i>Summary:</i> Pipe construction is fails</p> <p>Processing of profiles representing shells and compounds of faces has been corrected in <code>BRepFill_Pipe</code> algorithm.</p>
24597	<p><i>Summary:</i> Missing internal vertex in the result of General Fuse Operation</p> <p>New method <code>BOPDS_DS::FaceInfoIn</code> has been implemented to add the information about internal vertices on faces to the Data Structure.</p>
24612	<p><i>Summary:</i> Wrong pcurve of the section curve</p> <p>Useless workarounds interrupting work of the algorithm have been removed from <code>IntWalk_Iwalking::TestDeflection()</code> function.</p>
24618	<p><i>Summary:</i> Embedding vertex in BOP depends on the order of arguments</p> <p>The following corrections have been introduced to make the Boolean operation result independent from the order of arguments:</p> <ul style="list-style-type: none"> ▪ The condition for DS vertex index has been corrected in method <code>BOPDS_DS::AloneVertices</code>; ▪ The returning value has been corrected for vertices in function <code>BOPTools_AlgoTools3D::HasGeometry</code>.





24620	<p><i>Summary:</i> BOPAI go_CheckerSI returns interferences that are not sub-shapes of the source shape</p> <p>The following new methods have been introduced to return correct interferences:</p> <ul style="list-style-type: none"> ▪ BOPAI go_CheckerSI::SetNonDestructive(theFlag) sets the flag that defines what is processed: the argument copy when theFlag is true or the argument itself when it is false. ▪ BOPAI go_CheckerSI::NonDestructive() returns the corresponding flag. ▪ BOPAI go_CheckerSI::PrepareCopy() provides the argument copy; ▪ BOPAI go_CheckerSI::PostTreatCopy() provides post-processing for the copy.
24628	<p><i>Summary:</i> Intersection result is unfixed</p> <p>The map for collecting pave blocks of two faces in class BOPAI go_PaveFiller has been replaced with an indexed map to provide constant order of pave blocks when checking section curves for intersections.</p>
24633	<p><i>Summary:</i> Incorrect projection of a curve on a surface</p> <p>The algorithm of curve projection on surface has been improved in class ProjLib_ComputeApproxOnPlanarSurface.</p>
24639	<p><i>Summary:</i> Parallelization of FillDS part of BO</p> <p>The algorithms, which compute geometrical interferences between arguments of Boolean Operations, have been parallelized. For the moment this concerns Edge/Edge Vertex/Edge, Edge/Face, and Vertex/Face interferences.</p> <p>Draw command bfillds that tests partition commands now works in parallelized mode by default, but can be used with option -s in sequential mode:</p>
24640	<p><i>Summary:</i> Broken logic of check of variable for zero in IntCurvesFace_Intersection constructor</p> <p>The check of variable for zero in IntCurvesFace_Intersection constructor has been fixed to avoid FPE division by zero.</p>
24648	<p><i>Summary:</i> Different types of intersection curves between Cone and Torus with a different order of arguments</p> <p>The processing of torus and cone intersections has been improved in classes IntPatch_Intersection and BOPAI go_PaveFiller.</p>
24650	<p><i>Summary:</i> Wrong intersection curves obtained for a surface of revolution and a plane.</p> <p>The algorithm of intersection between a surface of revolution and a plane has been improved in method IntPatch_ImpPrmlIntersection::Perform.</p>
24654	<p><i>Summary:</i> Result of Boolean operation is invalid for bopargcheck if rotated</p> <p>New function ComputeBox has been implemented in method BndLib::Add to compute the bounding box for a bounded hyperbola.</p>



24655	<p><i>Summary:</i> Boolean common produces incorrect result</p> <p>The processing of p-curves convergent in node has been improved in static functions <code>RefineAngles</code> and <code>RefineAngle2D</code> from method <code>BOPAIgo_WireSplitter::SplitBlock</code>. The algorithm refining the p-curve angles now takes into account bounding curves if they exist.</p>
24667	<p><i>Summary:</i> <code>BRepOffsetAPI_MakePipe::FirstShape()</code> and <code>::LastShape()</code> return shapes that are not from the result</p> <p>The method <code>BRepFill_Pipe::MakeShape</code> has been fixed to return correct shapes.</p>
24696	<p><i>Summary:</i> Low performance of the new Edge/Edge intersection algorithm</p> <p>The following performance improvements have been introduced in <code>IntTools_EdgeEdge</code> class algorithms:</p> <ul style="list-style-type: none"> ▪ The check for common box between edges has been added: if is thin, the algorithm tries to find exact solutions without looking for rough ranges first; ▪ Methods <code>::FindBestSolution()</code> and <code>::CheckCoincidence(...)</code> have been improved by using method <code>SplitRangeOnSegments</code> with resolution of the curve as a criteria for the range size.
24706	<p><i>Summary:</i> Solids produced by BOP do not have flag Closed set in shells</p> <p>The <code>BOPAIgo_ShellSplitter</code> class has been modified to set <code>closed</code> flag for closed shells created during a Boolean Operation.</p>
24733	<p><i>Summary:</i> Subshape IDs change between two executions of the same script</p> <p>Method <code>BOPTools_Set::IsEqual</code> has been modified to take into account locations of the shapes. Method <code>BOPTools_Set::AddEdges</code> has been removed as redundant.</p>
24738	<p><i>Summary:</i> <code>BRepOffsetAPI_MakePipe</code> algorithm fails on circular path and section (if the result is a part of sphere).</p> <p><code>GeomFill_Sweep</code> algorithm has been improved for the case when the resulting pipe is a part of sphere.</p>
24751	<p><i>Summary:</i> Performance improvements in the Edge/Edge intersection algorithm</p> <p>New static method <code>PointBoxDistance()</code> has been added to compute the distance between a point and a bounding box. The method <code>IntTools_EdgeEdge::FindRoughRanges()</code> has been removed.</p>
24764	<p><i>Summary:</i> Wrong subshapes in the result of bopcheck operation</p> <p>The methods <code>BOPAIgo_CheckerSI::PostTreat()</code> and <code>BOPAIgo_ArgumentAnalyzer::TestSelfInterferences()</code> have been modified to exclude new shapes from the processing.</p>
24767	<p><i>Summary:</i> Crash on making edges in HLRBRep</p> <p>Additional check of the incoming curve type has been implemented in method <code>HLRBRep::MakeEdge</code>.</p>

Visualization

22974 24412	<p><i>Summary:</i> Impossible to customize text position</p> <p>The following improvements have been introduced to improve text presentation:</p> <ul style="list-style-type: none"> ▪ The methods <code>AIS_Dimension::GetTextPosition()</code> and <code>AIS_Dimension::SetTextPosition()</code> have been added to explicitly define the text position. It is also possible to set and unset text label alignment respectively to the attach points after the text position has been changed. ▪ The corresponding DRAW commands <code>vdi mparams</code>, <code>vdi mensi on</code>, <code>vmovedim</code>, <code>vangl edim</code>, <code>vdi stdim</code> and <code>vradi usdim</code> have been corrected.
24358	<p><i>Summary:</i> TKV3d – connected structures are not re-computed on device lost</p> <p>The method <code>Graphi c3d_StructureManager::ReComputeStructures()</code> has been corrected to take into account all child (connected) structures.</p>
24456	<p><i>Summary:</i> Use static assert instead of runtime exception</p> <p>Runtime check has been replaced with compile-time check in method <code>Graphi c3d_Materi al Aspect::NumberOfMateri als()</code>.</p>
24482	<p><i>Summary:</i> Provide description of <code>CSF_ShadersDi rectory</code> variable in the Overview</p> <p>System variable <code>CSF_ShadersDi rectory</code>, which defines the directory for GLSL programs (required for advanced rendering techniques and custom shaders) has been added in the list of system variables in the Overview.</p>
24483	<p><i>Summary:</i> Drop unused class <code>StdSel ect_BrepHi li ghter</code></p> <p>Obsolete class <code>StdSel ect_BrepHi li ghter</code> has been removed.</p>
24497	<p><i>Summary:</i> Add getter for window field</p> <p>New method <code>OpenGl _Context::GetWi ndow</code> gives access to the window of Open GL context.</p>
24511	<p><i>Summary:</i> Remove obsolete <code>Image_Pi xel Address. cxx</code></p> <p>Obsolete file <code>Image_Pi xel Address. cxx</code> has been removed from OCCT sources. Additionally some inconsistencies in file and unit lists have been corrected.</p>
24555	<p><i>Summary:</i> The same text is rendered with shift at the second time</p> <p>Method <code>Font_FTFont::l oadGl yph()</code> has been modified to use the same flags as <code>RenderGl yph()</code>.</p>
24564	<p><i>Summary:</i> <code>Select3D_Sensi tiveFace</code> gives inaccurate picking depth for <code>AIS_Pl ane</code> (interior selection)</p> <p>More accurate <code>Select3D_Sensi ti veTri angul ati on</code> has been implemented instead of <code>Select3D_Sensi ti veFace</code> for rectangular sensitive objects in <code>AIS_Pl ane::Compute()</code> and <code>AIS_Dimensi on::Compute()</code>.</p>



24569	<p><i>Summary:</i> AIS_InteractiveContext::Update(...) does not update selection when AIS_Plane is changed</p> <p>AIS_InteractiveContext::Update method has been modified to check, re-project and recompute selection structures even if presentations do not have the status "to be updated".</p>
24622 24725	<p><i>Summary:</i> Add method to AIS_TexturedShape class to assign texture data directly from byte stream</p> <p>AIS_TexturedShape and the graphical resource class Graphic3d_TextureRoot have been patched to allow sourcing texture data with Image_Pixmap class.</p> <p>The following changes have been made in connection with this issue:</p> <ul style="list-style-type: none"> ▪ The constructors accepting Image_Pixmap instances have been added to Graphic3d_TextureRoot, which can specify texture data as path to texture image, or as a pixmap. ▪ The methods to specify the texture source as Image_Pixmap::SetTexturePixmap have been added to AIS_TexturedShape.
24641	<p><i>Summary:</i> Public methods of OpenGL_Text and OpenGL_AspectText classes are not exported</p> <p>The methods of OpenGL_Text and OpenGL_AspectText classes required to work with text objects have become STANDARD_EXPORT.</p>
24642	<p><i>Summary:</i> Rotation angle is ignored in case of 2D text</p> <p>OpenGL_Text::setupMatrix has been modified to take the rotation angle into account.</p>
24668	<p><i>Summary:</i> Null flyout value case in AIS_Dimension::SetTextPosition() method is not considered</p> <p>The algorithms checking working plane and dimension geometry have been corrected in AIS_Dimension and its child classes.</p>
24671	<p><i>Summary:</i> glGetPointerv might be called without GL context</p> <p>GL function is now called with OpenGL_Context::IsValid() check in the destructor of OpenGL_Context.</p>
24747	<p><i>Summary:</i> Mesa fails to destroy context if it is set to the current thread</p> <p>The check to unset the threads of GL context before its destruction has been added in OpenGL_Window.</p>





24762	<p><i>Summary:</i> Visualization - new interactive object AIS_ColoredShape with customized subshape presentations</p> <p>New interactive object AIS_ColoredShape has been implemented to display a shape with different colours and other attributes of sub-shapes.</p> <p>The following changes have been made in the frame of this improvement:</p> <ul style="list-style-type: none"> ▪ The consistency of methods <code>::SetColor()</code>, <code>::SetMaterial()</code>, <code>::SetTransparency()</code> and <code>::SetWidth()</code> from AIS_Shape class has been improved. Color is now set for marker aspect as well. ▪ New command <code>vaspect</code> supersedes <code>vsetcolor</code>, <code>vsetmaterial</code>, <code>vsettransparency</code>, <code>vsetwidth</code> and their unset analogs. Syntax and arguments validation have been improved. ▪ <code>OpenGL_AspectMarker::SetAspect()</code> now does not reset <code>myMarkerSize</code> when the sprite is unchanged. ▪ <code>Iterator::Key()</code> and <code>FindFromKey()</code> from <code>NCollection_IndexedDataMap</code> have been extended with value copying.
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Data Exchange

24517	<p><i>Summary:</i> Crash at <code>StepToTopoDS_TranslateEdge::Init()</code></p> <p>The crash at <code>StepToTopoDS_TranslateEdge::Init()</code> when a curve is absent has been fixed. Additionally, the error message shown if there is no geom curve in the edge curve has been corrected.</p>
24549	<p><i>Summary:</i> Faulty shape after IGES translation with <code>xstep.cascade.unit</code> set to M</p> <p>The method <code>ShapeConstruct_ProjectCurveOnSurface::PerformAdvanced</code> has been modified to avoid creating p-curves as <code>Geom_Line</code> objects, which might cause incorrect parameterization.</p>
24596	<p><i>Summary:</i> Slow import of IGES data</p> <p>The following changes have been introduced to accelerate data import and check shape functionality:</p> <ul style="list-style-type: none"> ▪ <code>ShapeFix_IntersectingWires::FixIntersectingWires()</code> algorithm now starts with constructing <code>ShapeAnalysis_Surface</code> tool for the whole face and computes 2D bounding boxes for edges and wires before intersection checking. ▪ <code>BRepCheck_Face::IntersectWires()</code> algorithm now starts with computation of 2d boxes for edges and wires to reduce the number of calls of intersection tool for a pair of wires.
24675	<p><i>Summary:</i> Crash reading a VRML file</p> <p>A node index for normal is now passed through a map of corrected references to node indices in method <code>VrmlData_IndexedFaceSet::TShape</code>.</p>



Draw

24088	<p><i>Summary:</i> Unsafe window handle management in Draw using <code>GetWindowLong</code></p> <p>Window handle management has been improved to avoid crashes on 64-bit systems.</p>
24203	<p><i>Summary:</i> Command <code>sameparameter</code> on edge: tolerance is too great</p> <p>The command <code>sameparameter</code> now uses global extrema algorithm instead of the local one if the extreme point is too far from the initial point.</p> <p>Additionally, <code>mk2dcurve</code> command now can take the curve index as argument.</p>
24388	<p><i>Summary:</i> The option to enable visualization of hidden lines in DRAW</p> <p>The option to draw hidden lines has been added to <code>vhlr</code> command.</p>
24453	<p><i>Summary:</i> Extend information provided by <code>vstate</code> command</p> <p>The output of <code>vstate</code> command has been improved to display the following information.</p> <ul style="list-style-type: none"> ▪ Type of Interactive Object (basing on OCCT run-time information); ▪ Detected/Selected state; ▪ Sub-Shape numbers selected within the local context (for <code>AIS_Shape</code> only). <p>The local context is no more implicitly closed by <code>vstate</code> call.</p>
24458	<p><i>Summary:</i> Add commands for basic shape transformations</p> <p>The commands <code>bmove</code>, <code>btranslate</code>, <code>brotate</code>, <code>bmirror</code> and <code>bSCALE</code> have been added to <code>BrepTest_BasicCommands</code> to provide simple transformations of shapes by applying <code>TopLoc_Location</code> via the corresponding methods, such as <code>like Location</code>, <code>Move</code>, etc.</p>
24485	<p><i>Summary:</i> Create a subfolder in the directory for temporary test results</p> <p>The test results are now saved in an automatically created temporary subfolder named by the model <code>group-gridname-casename_<data>_<time with secs></code>. Previously they were stored in the root of <code>\$TEMP</code> directory.</p>
24599	<p><i>Summary:</i> Tools for interacting with DRAW from Visual Studio debugger</p> <p>It has become possible to perform DRAW commands from the Visual Studio debugger (Command Window) when DRAW is interrupted on a breakpoint.</p> <p>“Debugging tools and hints” manual describing how to use debug functions and other facilities and providing some hints has been added to Developer Guides.</p>

Mesh

24530	<p><i>Summary:</i> Remove unused package <code>IntPoly</code></p> <p>The obsolete package <code>IntPoly</code> has been removed.</p>
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Shape Healing

24370	<p><i>Summary:</i> <code>ShapeFix_EdgeProjAux</code> breaks conventions on using <code>ISDone</code> flag</p> <p>The class <code>ShapeFix_EdgeProjAux</code> has been modified to consider projection of 3d points corresponding to the edge range on a 2d curve successful for all cases except for the ones when projection is not made.</p>
24684	<p><i>Summary:</i> Command <code>fixshape</code> hangs up on the attached shape</p> <p>The algorithm finding a internal point for the given face has been corrected in method <code>BRepClass3d_SolidExplorer::FindAPointInTheFace</code>.</p>

Configuration

24580	<p><i>Summary:</i> CMake does not unset variables when 3rdparty products are not used</p> <p>The variables that become unused if the option to build <code>freeimage</code>, <code>opencl</code>, <code>tbb</code> and <code>gl2ps</code> products is disabled are now unset automatically.</p>
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Samples

24415	<p><i>Summary:</i> Update QT samples</p> <p>QT samples have been updated for the current OCCT version and now support both Qt 4.x and Qt 5.x.</p>
24479	<p><i>Summary:</i> Ray Tracing mode does not work in Qt IE sample</p> <p>The problems with the integration of Ray Tracing mode in IE sample have been fixed.</p>
24587	<p><i>Summary:</i> Separate TCL samples for ray tracing and creation of bottle</p> <p>New sample <code>raytrace.tcl</code> has been created to show ray tracing in DRAW. It renders a bottle and a glass on a rectangular table with shadows and reflections. The sample <code>bottle.tcl</code> now provides only modeling functionalities.</p>



Coding

24209	<p><i>Summary:</i> Cppcheck errors unusedScopedObject</p> <p>The problems with temporary objects that caused cppcheck errors unusedScopedObject have been eliminated in classes StdSelect_BrepSelectionTool, Extrema_GenExtCS and Poly_CoherentTriangulation.</p>
24252 24536 24635	<p><i>Summary:</i> GCC warnings on breakage of strict-aliasing rules</p> <p>The OCCT code has been revised to avoid GCC warnings on the following issues:</p> <ul style="list-style-type: none"> ▪ breakage of strict-aliasing rules. ▪ breakage of pointer aliasing rules ▪ inconsistent use of #ifdef statement
24510	<p><i>Summary:</i> Remove unused local variables</p> <p>The code of OCCT has been cleaned to avoid compiler warnings on unused local variables and function arguments.</p>
24512	<p><i>Summary:</i> Clang compiler complains about extra semicolon</p> <p>Clang compiler warnings about extra semicolons have been eliminated.</p>
24516	<p><i>Summary:</i> Copyright information has been corrupted within some headers</p> <p>Copyright information in headers has been corrected.</p>
24588 24607	<p><i>Summary:</i> Fix some GCC compiler warnings</p> <p>The following GCC compiler warnings have been fixed:</p> <ul style="list-style-type: none"> ▪ Enumeration value not handled in switch in Aspect_ColorScale and TNaming_DeltaOnModification. ▪ Comparison between signed and unsigned integer expressions in NIS_Triangulated, OSD_MallocHook and RWStl. ▪ Static function is defined or declared but not used in OpenGL_Workspace and ProjLib_ComputeApprox.
24624	<p><i>Summary:</i> Lost word in license statement in source files</p> <p>The following issues with source files have been fixed:</p> <ul style="list-style-type: none"> ▪ License text on top of OCCT source files has been corrected; ▪ Compiler warnings caused by Bison 2.41 have been disabled for MSVC; ▪ Some other compiler warnings on 64-bit Windows have been eliminated by appropriate type cast; ▪ Copyright and license statements have been added in XSD and GLSL files.
24730 24754	<p><i>Summary:</i> Remove constructor</p> <p>Useless void constructors have been removed from static classes TopOpeBRep_GeomTool and TopOpeBRep_PointGeomTool.</p>



24745	<p><i>Summary:</i> Needless inheritance of <code>OSD_MemInfo</code> from <code>Standard_Transient</code></p> <p>Inheritance of class <code>OSD_MemInfo</code> from <code>Standard_Transient</code> has been removed.</p>
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Documentation

24364	<p><i>Summary:</i> Document system should use local MathJax</p> <p>Usage of MathJax for insertion of formulas in the documentation has been improved: it is now possible to define the location of MathJax in <code>gendoc.bat</code> script.</p>
24431	<p><i>Summary:</i> Use of svg-images in the documentation</p> <p>It has become possible to use images in svg vector graphics format in the documentation. This format can be edited with Inkscape, which has become necessary for generation of PDF documents.</p> <p>Doxygen alias <code>@figure</code> has been added for insertion of images with a single command for both HTML and PDF output.</p> <p>More recommendations on document syntax, including formatting of plain text, code blocks, and references, have been added in <code>documentation.md</code>.</p>
24494	<p><i>Summary:</i> Value of <code>OCC_VERSION_DEVELOPMENT</code> is not taken into account in the generated overview documentation</p> <p>The parser of OCCT version has been corrected to include development macro in the complete version number.</p>
24526	<p><i>Summary:</i> Guide on Automatic Test System is obsolete</p> <p>The Testing System Guide has been revised and updated.</p>
24636 24685	<p><i>Summary:</i> Coding Rules - define rules for development of Draw Harness commands</p> <p>“Coding Rules” Developer guide that defines the rules for development of OCCT libraries and testing commands has been added to the documentation.</p>
24659	<p><i>Summary:</i> Misprints in draw documentation</p> <p>Some misprints in Draw documentation have been fixed.</p>



Products

Express Mesh

24559	<p><i>Summary:</i> Improve performance of shape preparation: turn on ready to use mechanism of caching in <code>myMapFace</code></p> <p>The mechanism that remembers the calculation result of a minimum face size has been enabled in class <code>QMShape_Tessellator</code>.</p>
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Advanced Samples

23717	<p><i>Summary:</i> Improvements of C# wrapper</p> <p>The comments about the wrapping procedure have been added in the wrapper.</p>
24052	<p><i>Summary:</i> Building the C# wrapper with vc10 and vc11 is not clear</p> <p>The scripts have been updated to allow building the wrapper with vc10 and vc11 in 32 and 64 bit modes.</p>
24566	<p><i>Summary:</i> Remove redundant configs from C# advanced projects and configure bin directories.</p> <p>The following improvements have been introduced in the configuration files:</p> <ul style="list-style-type: none"> ▪ Only x86 and x64 configurations have remained; ▪ <code>/bin/gobj</code> has been added in <code>OCWrapCSharp</code> x64 config; ▪ redundant <code>CASPROD</code> variable has been removed;.
	<p><i>Summary:</i> Update C# wrapper for OCCT 6.7.0</p> <p>C# wrappers have been updated for OCCT 6.7.0:</p> <ul style="list-style-type: none"> ▪ New macros <code>WRAP_AS_COLLECTION*</code>, <code>WRAP_AS_MAP*</code> and <code>WRAP_AS_DATAMAP*</code> have been added for wrapping <code>NCollection</code> template classes; ▪ Low-level BOP classes (<code>BOPDS</code>, <code>BOPAlgo</code>, etc.) have been wrapped; ▪ The script dispatching wrapper classes by namespaces corresponding to OCCT packages has been improved to analyze actual use of packages instead of using a hard-coded list; ▪ SWIG 2.x is now required for generating wrappers.

DXF Import-Export

24523	<p><i>Summary:</i> Colors and layers are lost during loopback test (read-write-read)</p> <p>Command <code>XGetShapeColor</code> has been corrected to return generic color.</p>
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Mesh Framework

24681	<p>Summary: Improvement to estimate quality of a surface mesh by different criteria</p> <p>The mechanism to estimate surface mesh quality by several criteria has been implemented in the new type <code>OMFControl_MeshQuality</code>.</p>
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PARASOLID-XT Import

24781	<p>Summary: Binary files without schema modifications are not read</p> <p>The problem with incorrect processing of some fields in the header data of binary files has been fixed.</p>
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Supported Platforms and Pre-requisites

Open CASCADE Technology is supported on Windows (IA-32 and x86-64), Linux (x86-64) and MAC OS X (x86-64) platforms.

The table below lists the product versions used by OCCT and its system requirements.

The most up-to-date information on Supported Platforms and Pre-requisites is available at <http://www.opencascade.org/getocc/require/>.

Linux Operating System	Mandriva 2010, CentOS 5.5, CentOS 6.3, Fedora 17, Fedora 18, Ubuntu-1304, Debian 6.0 *
Windows Operating System	MS Windows 8 / 7 SP1 / Vista SP2 / XP SP3
Mac OS X Operating System	Mac OS X 10.9 Mavericks / 10.8 Mountain Lion / 10.7 Lion / 10.6.8 Snow Leopard
Minimum memory	512 MB, 1 GB recommended
Free disk space (complete installation)	650 MB of disk space, or 1,4 GB if installed with reference documentation
Graphic library	OpenGL 1.1+ (OpenGL 2.1+ is recommended)
C++ <i>For Linux:</i> <i>For Windows:</i> <i>For Mac OS X:</i>	GNU gcc 4.0. - 4.7.3. Microsoft Visual Studio 2005 SP1 with all security updates Microsoft Visual Studio 2008 SP1** Microsoft Visual Studio 2010 SP1 Microsoft Visual Studio 2012 Update 3 Microsoft Visual Studio 2013 Intel C++ Composer XE 2013 SP1 XCode 3.2 or newer (4.x is recommended)
TCL (for testing tools) <i>For Linux:</i> <i>For Windows:</i> <i>For OS X:</i>	Tcltk 8.5 or 8.6 http://www.tcl.tk/software/tcltk/8.6.html ActiveTcl 8.5 or 8.6 http://www.activestate.com/activetcl/downloads Built-in Tcl/Tk 8.5
Qt (for demonstration tools)	Qt 4.6.2 http://qt.nokia.com/downloads
Freetype (OCCT Text rendering)	freetype-2.4.11 http://sourceforge.net/projects/freetype/files/
FreeImage (Support of common graphic formats)	FreeImage 3.15.4 http://sourceforge.net/projects/freeimage/files/Source%20Distribution/
gl2ps (Export of OCCT viewer contents to vector graphic file)	gl2ps-1.3.8 http://geuz.org/gl2ps/
TBB (optional tool for multithreaded algorithms)	TBB 3.x or 4.x http://www.threadingbuildingblocks.org/
OpenCL (optional for ray tracing visualization core)	OpenCL 1.2.8 (with GPU devices for run-time Ray Tracing rendering)
Doxygen (optional for building documentation)	Doxygen 1.8.5 http://www.stack.nl/~dimitri/doxygen/download.html

- * Debian 60 64 bit is a permanently tested platform.
- ** The official release of OCCT for Windows contains libraries built with VC++ 2008.

