Welcome to the latest edition of The PLM Components Newsletter.

PLM Components are software tools developed by Siemens PLM Software for product design, manufacture, engineering, simulation, visualization and collaboration. They are licensed to application developers in the CAD, CAM, CAE and PLM industry for integration into their own products. For more product information see ‘Product line summaries’ below or visit our website at www.plm.automation.siemens.com/open

Parasolid in 3.5 million seats, DCMs in 2.9 million

The number of active end-user seats of software based on Parasolid has surpassed 3.5 million. As the world’s most widely used 3D geometric modeling component, Parasolid provides solid modeling functionality and interoperability to over 150 independent software vendors (ISVs) and over 350 of the industry’s most popular software applications across a broad cross section of disciplines...

Read more...

Parasolid and D-Cubed news

D-Cubed 2D DCM in ZWCAD Professional. ZWCAD Software releases the first IntelliCAD based application with a new parametric sketcher powered by the widely used 2D Dimensional Constraint Manager.

Read more...

Parasolid, DCMs and CDM (Collision Detection Manager) in ZWCAD’s ZW3D. ZWCAD acquired VX and decided to sign-up for ongoing use of four of Siemens' PLM Components.

Read more...

Parasolid, DCMs and CDM in IronCAD’s 3D Connector. IronCAD releases a new product that helps integrate 3D models into a 2D drafting environment and extends its use of four PLM Components.

Read more...

Joe Gibbs Racing licenses D-Cubed 3D DCM

Joe Gibbs Racing, one of the premier organizations in NASCAR, licensed the 3D DCM for deployment in its in-house software applications, used to optimize the performance of its cars.

Read more...

Parasolid Complementary Toolkit Providers Initiative

With the introduction of the Complementary Toolkit Provider Initiative (CTPI), Siemens PLM Software is reaching out to popular toolkit providers whose technology complements the Parasolid geometry kernel.

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Issue 7, April 2011

New release of Parasolid

Since our last newsletter we have released Parasolid V23.1 which delivers a set of enhancements that offer genuine productivity gains to application developers which in turn benefit end-users.

Read more...

New releases of D-Cubed components

We have made a new release of each of the six D-Cubed components, improving this range of tools for geometric constraint solving, collision detection, hidden line computation and motion simulation.

Read more....

New customers and integrations

Narinsoft (a subsidiary of MIDAS IT), Korea, released their midasNFX analysis product utilizing Parasolid Designer.

Blue Ridge Numerics, USA, (recently acquired by Autodesk) Licensed Parasolid Editor for use in their CFdesign fluid flow and heat transfer solution.

CAM-Service, Germany, licensed Parasolid Designer to use in its Cagila CAD/CAM software for cutting tools such as lasers, water jets and plasma.

ESI Group, France, licensed Parasolid Communicator for use in their NX, SolidWorks and Parasolid XT Translators.

Lattice Technology, Japan, were assigned InterDesign's 3D DCM license for ongoing use in the Vmech mechatronics product. They also joined the JT Open Program.

Adaptive 3D Technologies, India, licensed Parasolid Designer and D-Cubed 3D DCM for use towards the development of a new 3D CAD product that targets the needs of the Indian SMB marketplace.

Nemetschek Vectorworks, USA, made a major new release of the Vectorworks (Vectorworks 2011) modeling product for architectural design based on Parasolid Designer.
New members of the JT Open Program

PI-VR, Germany, developer of the VRED product line for visualization and virtual prototyping, joined the JT Open Program.

Visual Collaboration Technologies, USA, developer of the VCollab visualization and collaboration tool for CAD/CAM/CAE data-sets, joined the JT Open Program.

Santos Human, USA, developer of the Santos virtual human modeling software, joined the JT Open program.

Transmagic, USA, joined the JT Open Program in order to add JT support to their line of 3D interoperability products.

Latest JT release

Version 5.6 of the JT Open Toolkit was released in November 2010.

2010 JT Open International Conference report

The 2010 JT Open International Conference was held in Orlando, Florida, in September. This conference examined the technological advances made possible by the deployment of JT, and how industry leaders are building global PLM capabilities using JT. The high quality content is well illustrated by the conference presentations, available here.

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3.5 Million Active End-User Seats of Software Based On Parasolid

The number of active end-user seats of software based on Parasolid has surpassed 3.5 million. As the world’s most widely used 3D geometric modeling component, Parasolid provides solid modeling functionality and interoperability to over 150 independent software vendors (ISVs) and over 350 of the industry’s most popular software applications across a broad cross section of disciplines including computer-aided design (CAD), engineering analysis (CAE), manufacturing (CAM) and architectural engineering and construction (AEC). Through the combination of its technology, quality and open business model, Parasolid has demonstrated a high degree of business value to ISVs in four principal sectors.

- CAD – Parasolid is the most widely used 3D geometric modeling component in this highly demanding market where the ability to efficiently update the digital model supersedes all other requirements. Product designers rely upon Parasolid to create a wide variety of highly accurate and detailed 3D models, from aircraft engines to mobile phones to construction equipment, using software.

- CAE and CAM – As the component software used to create over 40 percent of the world’s 3D digital models, Parasolid has become the logical choice for vendors of CAE and CAM software needing to import data created in the wide variety of CAD applications based on Parasolid. Many of these companies now also use Parasolid functionality to simplify designs for analysis, create derivative designs such as molds and tooling, and provide design creation capabilities.

- AEC – An increasing number of mainstream buildings and iconic architectural structures are designed and detailed using AEC applications based on Parasolid.

- Interoperability – Siemens PLM Software’s commitment to open solutions and an open business model has made Parasolid a popular format for seamlessly sharing data between a wide variety of applications. Parasolid XT data is included in the software development toolkit that supports Siemens PLM Software’s JT Open Program, an influential community of users, software vendors, and interested parties spanning the PLM value chain who influence and promote the development and expanded use of the JT™ data format as a global standard for visualization, collaboration and data sharing.

2.9 Million Active End-User Seats of Software Based on D-Cubed DCM Components

We are also proud to announce the number of active end-user seats of software based on one or both of the D-Cubed DCM (Dimensional Constraint Manager) geometric constraint solving components has now exceeded 2.9 million. The D-Cubed DCMs have by far the largest market share of CAD, CAM and CAE seats that use geometric constraint solving components. Many of these DCM based applications also use Parasolid, emphasising the major contribution that Siemens’ PLM Components makes to many vendors in the engineering software development community.

The range of customers using at least one of the DCM components includes ANSYS, Autodesk, Bentley Systems, Dassault Systèmes SolidWorks, DIPRO, Fujitsu, Intergraph, INUS, Nemetschek Vectorworks and Vero Software, to name just a few. Siemens PLM Software has also integrated both components in its NX™ software and Solid Edge® software.

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ZWCAD Software releases D-Cubed 2D DCM geometric constraint solver in their ZWCAD IntelliCAD-Based Application

In December 2010, ZWCAD Professional became the first application based on the IntelliCAD Technology Consortium's IntelliCAD software to be powered by the D-Cubed 2D DCM (Dimensional Constraint Manager). The 2D DCM controlling a sketch is shown below:

The D-Cubed 2D DCM controlling a sketch in ZWCAD Software's ZWCAD product

Says Kingdom Lin, vice director of the overseas department at ZWCAD Software:

“Our software developers were impressed with the functionality, performance and reliability of the 2D DCM, as well as its ease of integration, thanks to the assistance of the D-Cubed components support team and the new 2D DCM Teigha Wrapper. The stable business model of the D-Cubed organization also reassured us that our long-term supply of the 2D DCM will remain secure. Overall, a very favorable cost/benefit analysis made the 2D DCM the clear choice for ZWCAD.”

ZWCAD Software is a member of the IntelliCAD Technology Consortium and Open Design Alliance (ODA). The 2D DCM is offered to members of these organizations with the 2D DCM Teigha software wrapper (Teigha being an ODA technology), an interface that can help them integrate the 2D DCM rapidly into their applications.

See related press release:

ZWCAD Selects Siemens PLM Software’s D-Cubed Constraint Solver for IntelliCAD-Based Application

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ZWCAD Software licenses Parasolid Communicator and D-Cubed 2D DCM and 3D DCM for use in ZW3D

In August 2010 ZWCAD Software acquired the VX CAD/CAM products and licensed three of Siemens’ PLM Components to continue to power sketching, assembly constraining and Parasolid XT interoperability in what became known as the ZW3D product line. The 2D DCM controlling a sketch is shown below:

![The D-Cubed 2D DCM controlling a sketch in ZWCAD Software’s ZW3D product](attachment:image)

Says **Kingdom Lin**, vice director of the overseas department at ZWCAD Software:

“Having decided to acquire the VX CAD/CAM product line as the foundation for our move into 3D CAD/CAM with ZW3D, the decision to license these four components from Siemens PLM Software followed on naturally from our prior decision to license the D-Cubed 2D DCM for our ZWCAD Professional product. We evaluated the D-Cubed 2D DCM software intensively. As a result, we discovered the qualities that underpin its market-leading position, and in the process became convinced of Siemens PLM Software’s status as a dependable long-term provider of core CAD/CAM technologies backed by high quality support services.”

See related press release:
ZWCAD Software Licenses Parasolid and Additional D-Cubed Components from Siemens PLM Software

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IronCAD, Inc. have introduced a 3D integration capability called 3D Connector into IRONCAD Draft. Supported by the Parasolid geometric modeling component, users can import 3D models to be viewed, analyzed, rendered and referenced as the user produces drawings using IRONCAD Draft’s many 2D mechanical drafting functions.

3D models imported from IRONCAD can be repositioned under the control of any existing dimensions and constraints using the D-Cubed 2D and 3D Dimensional Constraint Managers (DCMs). This allows the user to reconfigure a constrained model to meet the requirements of a specific 2D drafting or detailing task. Using the D-Cubed Collision Detection Manager (CDM) users can also quickly verify that new configurations don’t result in colliding parts.

Drafting operations on an imported model

Says Cary O’Connor, director of Product Marketing for IronCAD:

“The Parasolid and D-Cubed components have for many years been making critical contributions to the fundamental capabilities of IRONCAD, our full feature 3D part and assembly modeling product. We’re delighted to be able to make further use of these components in IRONCAD Draft, allowing users to leverage constraint information from their 3D models in the context of a dedicated drafting and detailing tool.”

See related press release:
Siemens PLM Software’s Parasolid and D-Cubed Components Power new Product from IronCAD

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Siemens PLM Parasolid team introduces the Complementary Toolkit Provider Initiative (CTPI)

Today’s developers of 3D geometric related software applications have many choices of software development components and/or toolkits to help jumpstart their development. Usage of these component technologies allows developers to focus on their unique value-add development activities by avoiding work on difficult to duplicate technology and integrations. The Siemens PLM Parasolid team has a long history of working with third party technology providers. A good example is the HOOPS/Parasolid Bridge available for the HOOPS 3D Framework from Tech Soft 3D. Another example is the integration between Parasolid and Siemens PLM Software’s own D-Cubed Collision Detection Manager.

With the introduction of the Complementary Toolkit Provider Initiative (CTPI), Siemens PLM is reaching out to popular toolkit providers whose technology complements the Parasolid geometry kernel. Available toolkits our customers are using, or may consider, support a number of key development areas: CAM/CNC, CAE Meshing, Graphics/Rendering, Data Translation and more. A key aspect of the program is to provide CTPI members with a complimentary copy of the Parasolid development toolkit with the agreement that they build a standard integration (bridge) to Parasolid that our mutual customers can utilize, thus avoiding “reinventing the wheel” to integrate the two technologies. The resulting integration is distributed by the CTPI member only to mutual customers at no charge (customer must be a valid Parasolid licensee to qualify).

Since the last edition of the PLM Components newsletter new software developers to join the CTPI and license Parasolid to develop a software bridge include:

- **MachineWorks**, UK, for their CNC Simulation and Verification Toolkit software
- **Lightwork Design**, UK, for their advanced rendering toolkit
- **Visual Kinematics**, USA, for their VisTools/Mesh, VglTools and VdmTools toolkits for the CAE industry
- **Redway3D**, France, for their Redsdk visualisation and rendering toolkit

These companies join **ModuleWorks** (supplier of a high quality CAM component), **Tech Soft 3D** (makers of the HOOPS graphical toolkit), and **Simmetrix** (developer of the GeomSim CAE simulation components) as companies providing direct integrations to Parasolid. Look for more announcements related to new members of the CTPI in the near future.

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Latest JT release

Version 5.6.0.0 of the JT Open Toolkit was released in November 2010. This release offers improvements for existing JT Open Toolkit users in several areas. The toolkit now supports new objects to manage layers and layerfilter, and example code is included to demonstrate use of these objects. Also new with this release, methods for the definition of polygons with internal shapes. With the introduction of a 3D image stamp, users are able to assign an image that can be configured such that it is always visible from a supporting viewer. Teamcenter viewers support this technology with the 8.3 release (including JT2Go).

The Visual C++ 2008 SP1 compiler on Windows XP (Service Pack 2) and on Windows XP 64-bit Edition (Service Pack 1) is now supported. The Visual C++ 7.1 compiler and the Visual C++ 2005 (no Service Pack) compiler are no longer supported.

Both the 32 bit and the 64 bit versions of the gcc 4.1.2 compiler on SUSE Linux Enterprise Server 10.1 are now supported.

The operating system version for MAC is now Darwin Kernel Version 9.2.2.

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Parasolid V23.1 released November 2010

Since our last newsletter we have released Parasolid V23.1 in which we have maintained our approach of addressing customer needs in a comprehensive and diligent manner to create functionality that is broad and deep in a way that no other component modeler can match. V23.1 delivers a set of enhancements that offer genuine productivity gains to application developers which in turn benefit end-users.

Sheet Modeling

Parasolid V23.1 includes further enhancements to sheet modeling technology, targeted at the computer-aided engineering analysis (CAE) market.

- Neutral sheets may now be created from multiple faces in a single operation with control over how sheets are extended to create a valid solution and how holes in resulting neutral sheets are filled.

![Creating neutral sheets from multiple faces in a single call with control over how resulting holes are handled](image)

- Wire bodies and sheet bodies can now be united together in Boolean operations.
- Thickening of sheet bodies has been improved to automatically detect and repair degeneracies in the input bodies, together with further improvements to automatic repair of self-intersections that may arise when thickening a sheet with tightly-curved areas by more than its radius of curvature in certain areas.

Interoperability

As the geometric modeling component – or kernel – of choice in many of the world’s leading CAD, CAM and CAE applications, Parasolid is often required to work with imported data from other systems that require various levels of geometry and topology repair. Parasolid V23.1 includes several new functions in this area:

- A new function to create the topology of a body provides extended diagnostics that can be used to fine-tune import of boundary representation data into Parasolid
- A new function is provided to streamline the attachment of edge geometry using different methods, under the control of the calling-application.
- Two new functions are added to find and repair degeneracies in imported surface data to facilitate optimal behavior in downstream modeling operations performed at the higher precision used by Parasolid.

Application Support

Numerous enhancements have been made to improve the productivity of developers integrating Parasolid into a new or existing application. These include:

- Imprinting - a new API is provided with a revised options structure and tracking information.
- Facetting – additional mapping of facet topology to the model topology of the part from which the facets were created.
Modeling Enhancements

Parasolid v23.1 also includes a large number of small enhancements together with extended case coverage and robustness in the areas of blending, local operations and surfacing.

Table to map facet points directly to original model topology

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Setback blend surface quality - improvements to remove areas of undesirable tight curvature
Product line summaries

Parasolid

Parasolid® software is the world’s leading production-proven 3D geometric modeling component, providing core functionality that enables users of Parasolid-based products to model the industry’s most complex products. Based on high precision boundary-representation technology, Parasolid supports solid modeling, generalized cellular modeling and freeform surface-sheet modeling within an integrated framework.

Parasolid Bodyshop is an add-on component that validates and optimizes the integrity and reliability of imported data using model healing and repair technology. A range of translators enable data transfer with most major CAD formats.

More about Parasolid

D-Cubed components

The 2D and 3D Dimensional Constraint Manager (DCM) components, part of the D-Cubed™ software product line, are the world’s most widely used geometric constraint solving components. They are applied to 2D and 3D parametric sketching, part shape control, assembly part positioning and kinematic motion simulation.

The D-Cubed Profile Geometry Manager (PGM) adds a range of productivity tools to the 2D environment in 2D or 3D design and manufacturing applications, including offset profile functions and parametric sketching operations in addition to those provided by the 2D DCM.

The D-Cubed Collision Detection Manager (CDM) identifies collisions and computes clearances with high speed and accuracy in applications ranging from assembly modeling to mechanism simulation, CAM and CMM.

The D-Cubed Hidden Line Manager (HLM) computes accurate hidden line views rapidly and is suitable for model visualization, engineering drawing production and technical illustration.

The D-Cubed Assembly Engineering Manager (AEM) simulates the motion of assemblies and mechanisms, taking account of the interaction of parts as they come into contact and transmit motion.

More about D-Cubed components

JT Open

JT Open is a unique program to help members leverage the benefits of open collaboration across the extended enterprise through the adoption of the JT format, a technology that makes it possible to view and share product information throughout the product lifecycle.

More about JT Open

PLM XML

PLM XML is a format created by Siemens PLM Software to facilitate product lifecycle interoperability using XML. It is an open and published format that complies with the World Wide Web Consortium (W3C) XML schema recommendation.

More about PLM XML

PLM Vis

PLM Vis provides highly customizable 2D and 3D visualization and mark-up tools. It is used by software vendors to enhance their applications and by end-users to enrich current, and develop new, business processes. Examples include Boeing, Caterpillar, John Deere, LG, Sikorsky and Visiprise.

More about PLM Vis
Geolus Search

Geolus Search is a 3D search engine which will rapidly track down parts similar to a given example based on its geometry. The ability to reuse parts and information provides savings in design time, cost estimating, procurement, manufacturing, and inventory. The results of a 3D geometry search capability include the ability to reuse parts, reuse knowledge, compare cost, and reduce part development costs.

More about Geolus

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