

SolidWorks Corporation

**3D PartStream**  
by SolidWorks

## **SolidWorks Builds a Flexible, Valuable Web Service with Microsoft .NET Technology**

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***SolidWorks Corporation is a leading supplier of 3D mechanical design solutions. The company has recently teamed with TechniCon Corporation to build a subscriber-based Web service that allows manufacturers to add 3D CAD models to their online catalogs, parts manuals and other applications. Built on the Microsoft® .NET Framework and deployed with Microsoft .NET Enterprise servers, 3D PartStream.NET is allowing SolidWorks to partner with leading e-commerce and online catalog solution providers. The flexibility of XML and SOAP are providing SolidWorks with the ability to expand its business into a new arena while staying focused on its core competency.***

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### **Situation**

SolidWorks Corporation develops and markets powerful, easy-to-use 3D mechanical design solutions. The company's primary product, SolidWorks® software is the first 3D CAD system to bring the power of solid modeling into a native Windows environment at a price affordable for every engineer. SolidWorks customers range from medical equipment and machinery manufacturers to the consumer product, aerospace, automotive, and defense industries.

Manufacturers of mechanical components – valves, pistons, levers and the like – are unlike other manufacturers in that their ultimate goal is to be "designed in" by other manufacturers further up the food chain. This means that their component will be used as part of a larger product. If a component makes it at the design level, a sale - often for thousands of units or more - will follow when the manufacturer goes to production. For SolidWorks, the goal is to help component manufacturers get designed in: helping them get their products incorporated as components of other manufactures' finished products. To help component manufacturers capitalize on this unique characteristic, SolidWorks decided to develop a subscriber-based Web service to help manufacturers deliver 3D models via the Web.

### **Solution**

With 3D PartStream.NET, SolidWorks augments design communication and e-commerce between manufacturers and their customers by allowing users to view products from all angles and configure these models based on their specific requirements. The Web service was built on the Microsoft's platform and deployed with Microsoft .NET Enterprise servers, including

### **Solution Overview**

#### **Customer Profile**

SolidWorks Corporation develops and markets 3D mechanical design solutions. Its customers include manufacturers in the medical, aerospace, automotive, defense and other industries.

#### **Business Situation**

SolidWorks recognized the value of providing manufacturers with a way to offer engineers access to 3D models via the Internet. This would allow access to configurable, updated and new products and in turn would increase a manufacturer's ability to get "designed in" by engineers.

#### **Solution**

##### **Benefits**

SolidWorks built its 3D PartStream.NET Web service on the Microsoft® .NET Framework and deployed it with Microsoft .NET Enterprise servers. Building a powerful and flexible Web service on Microsoft .NET technology allowed SolidWorks to form partnerships with e-commerce and online catalog solution providers. Leveraging XML (Extensible Markup Language) and SOAP (Simple Object Access Protocol) allows the service to be easily integrated with a wide variety of systems.

##### **Software**

Windows® 2000 Advanced Server.  
SQL Server™ 2000 Enterprise Edition.  
Application Center 2000.  
Visual Studio®

##### **Partners**

TechniCon Corporation

##### **Scenario**

Subscriber-based Web service

Windows® 2000 Advanced Server (with Internet Information Services - IIS 5.0) and SQL Server™ 2000. Effective and simple management of the Web operation is facilitated by the use of Microsoft Application Center 2000.

SolidWorks runs and hosts the service, exposing it to customers via interfaces based on XML (Extensible Markup Language) and SOAP (Simple Object Access Protocol). A manufacturer can add new models, remove obsolete models and make any other necessary changes simply by logging on to the 3D Model Manager (the 3D PartStream.NET database that stores the 3D CAD designs for online catalogs). Among other advantages, 3D PartStream.NET customers have the ability to conduct batch uploads of their product models, view catalog usage statistics, and add new product configurations with different dimensions to an online catalog.

When a user is browsing a manufacturer's catalog and wants to view a 3D model or 2D drawing, the browser makes an XML-based request for a particular part configuration. Part and viewing information is looked up at the database, and then sent to a server-based SolidWorks CAD/CAM application which generates the 3D model and streams it to the user's browser. Although the information is actually hosted and served up by 3D PartStream.NET, the interface is transparent and the user sees the displayed model as part of the manufacturer's catalog. The model is available for download in a wide variety of industry-standard formats, including multiple versions of those formats where applicable.

The 3D PartStream.NET service consists of an administrative component and an external interface component. 3D Model Manager, the administrative component, is essentially an ASP-based (Active Server Pages) database application. ASP pulls together a set of Visual Basic®-based COM components that talk to the SQL Server 2000 database. The application also uses COM+ components to communicate with the back end CAD model generation server. Application Center 2000's Component Load Balancing provides high availability as well as the scalability needed for the service, allowing the 3D PartStream.NET COM+ component execution load to be distributed across multiple servers.

The interface component provides an XML/HTTP interface that uses SOAP to package the messages. The VB components that are used to talk to SQL Server 2000, as well as the COM+ components that are used to talk to the CAD model generation server, also generate and deliver the CAD files and information to the 3D PartStream.NET users.

## **Benefits**

For manufacturers, the benefits of 3D PartStream.NET are obvious. "The typical engineer's office most likely contains a bookshelf with a large stack of paper catalogs, all obsolete since the day the manufacturers published them," says John McEleny, Chief Operating Officer at SolidWorks. "The Web enables manufacturers to not only create electronic catalogs, but to make 3D modeling data available electronically. This is an incredibly valuable tool that can help companies increase sales and product delivery."

Microsoft's .NET Enterprise servers and XML/SOAP have been designed to allow companies like SolidWorks to create flexible, feature-rich Web services like 3D PartStream.NET and make them readily available for the widest range of users.

*"The inherent flexibility of .NET makes it easy for our partners to integrate 3D PartStream.NET with the widest variety of platforms. That ease of integration makes the service more attractive to potential partners. For us, it means we can offer this Web service to these various customers with one single set of APIs - providing us with one standard way of talking to all parties without proliferating costs."*

Jim Giebutowski  
Director of Content Publishing  
SolidWorks Corporation

## **Scalable, Available, and Manageable**

For companies like SolidWorks, the Windows 2000 platform provides a reliable and easily scalable environment for building Web services – especially when, as SolidWorks has done, combined with Application Center 2000 and SQL Server 2000. Scalability and availability are important for SolidWorks because it fully expects an increasing number of manufacturers to take advantage of the service as more and more manufacturers offer catalogs and other product information online. This will lead to an increase in both the size of the application and the demand for the application.

Utilizing the server management capabilities of Application Center 2000 ensures the highest levels of availability and facilitates scaling of the system. Application Center 2000 empowers developers and Web site administrators, allowing them to deploy applications quickly and easily while minimizing the in-depth application knowledge requirements. In turn, this reduces the complexity and cost of operating a scalable, highly available application such as 3D PartStream.NET. SolidWorks expertise is in producing 3D modeling solutions; Application Center 2000 helps minimize the expense of effectively managing a highly available, first-class Web service and focus on delivering world-class 3D for manufacturers to deliver content via the Internet.

"Supplier catalogs powered by 3D PartStream.NET can have literally millions of models available to end users", says Austin O'Malley, VP of Internet Product Development for SolidWorks.

"Application Center's load balancing features allow us to effectively deploy multiple model generation servers. This allows us to quickly deliver dynamically generated 3D content to end users."

## **Flexibility Promotes Partnerships**

SolidWorks' decision to build the 3D PartStream.NET Web service on the Microsoft platform has helped attract valuable partners. Although some manufacturers have the internal capabilities to build their own e-commerce applications, and apply the Web service to their online catalog themselves, most do not. Most manufacturers turn to outside sources to develop this increasingly important part of their business. Since SolidWorks itself is not an e-commerce solution provider, it is very important that SolidWorks be able to form partnerships with companies whose expertise is actually building e-commerce and online catalog solutions. "The inherent flexibility of .NET makes it easy for our partners to integrate 3D PartStream.NET with the widest variety of platforms," says Jim Giebutowski, Director of Content Publishing for SolidWorks Corporation. "That ease of integration makes the service more attractive to potential partners. For us, it means we can offer this Web service to various customers with one single set of APIs - providing us with one standard way of talking to all parties without proliferating costs."

One of SolidWorks key partners is TechniCon Corporation - a leading provider of e-commerce and online catalog solutions for manufacturers. TechniCon's CustomCommerce software combines dynamic product selection and configuration technology to help customers narrow the field of product options and simplify the purchase of complex items. "Microsoft's SOAP technology allows us to bring a powerful solution to manufacturers – allowing them to offer their customers a rich 3D experience within a seamlessly integrated interface," says Anthony Mirante, Founder and President of TechniCon Corporation.

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TechniCon Corporation

TechniCon recently applied 3D PartStream.NET as a key component of an online catalog solution developed for SMC Corporation - the world's largest manufacturer of pneumatic and electrical automation products. SMC's online catalog simplifies the configuration and sale of its complex, highly variable products, allowing customers to easily sort through 8,000 different products that can have up to one million variations. Because 3D PartStream.NET is a subscriber-based Web service, it helps TechniCon provide SMC with a way to offer 3D models over the Internet without having to further their investment in IT infrastructure and personnel. "Our customers can get information on demand - solving technical problems and downloading CAD data as they need it," says Tony Hutchinson, Marketing Manager for SMC. "We don't need to have our design engineers dedicated to just providing our customers with CAD models 3D PartStream.NET provide an efficient means for delivering 3D models - allowing our engineers to shift their focus back to design."

Adherence to open standards such as XML and SOAP allows SolidWorks to partner with industry leaders like TechniCon, who in turn provide solutions to top manufacturing companies such as SMC. "Building on Microsoft .NET and adhering to open standards has made our service more attractive to publishing partners like TechniCon," says Giebutowski. "This allows us to focus on our core competency - developing 3D mechanical design solutions - leaving the e-commerce applications to partners like TechniCon."

### ***Flexible, Independent Data***

"One of the concepts behind Microsoft's .NET philosophy that we found particularly valuable is the concept of what we call 'data independence' - that is, one data source serving different applications," says Giebutowski. "We liked the idea that all of our customers' data, stored in one central place, could be accessible by multiple applications."

SQL Server 2000 provides extensive database programming capabilities built on Web standards. Rich XML and Internet standard support allows for the storage and easy retrieval of data. The flexibility of XML allows data that is stored in the 3D Model Manager to be accessible from different applications. For instance, a manufacturer may have items in the database that are accessed via a product catalog. The same data objects can also be available for a distributor's online catalog, an online marketplace, and whatever other applications the manufacturer needs.

Another advantage of SQL Server 2000 is its ability to provide SolidWorks with data analysis. SolidWorks is able to give 3D PartStream.NET customers access to usage statistics - giving the manufacturer valuable information. The catalog usage statistics allow the manufacturer to monitor how many views and downloads their customers are accessing, providing a better understanding of how productive their online catalogs are.

The .NET Enterprise Servers are Microsoft's comprehensive family of server applications for building, deploying and managing next generation integrated Web experiences that move beyond today's world of standalone Web sites. Designed with mission-critical performance in mind, .NET Enterprise Servers provide fast time to market as well as scalability, reliability and manageability for the global, Web-enabled enterprise. They have been built from the ground up for interoperability using open Web standards such as XML. The .NET Enterprise Servers are a key part of Microsoft's broader .NET strategy, which will enable a distributed computing model for the Internet based on Internet protocols and standards in order to revolutionize the way computers talk to one another on our behalf.

## ***For More Information***

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For more information on SolidWorks products or services call 800-693-9000 or visit their web site at: <http://www.solidworks.com> Company's website

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