



Customer: Autodesk

Web Site: www.autodesk.com

Customer Size: 7,800 employees

Country or Region: United States

Industry: Manufacturing

Customer Profile

Founded in 1982 and headquartered in San Rafael, California, Autodesk is a world leader in 2D and 3D design, engineering, and entertainment software.

Software and Services

- Microsoft Visual Studio
 - Microsoft Visual Studio 2010 Ultimate
- Technologies
 - Microsoft .NET Framework 4

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Design-Software Leader Streamlines Build Environment, Cuts Costs, Supports Partners

"We now can implement global policies for property settings, so our build is significantly more reliable and repeatable."

Albert Szilvasy, Software Architect, Autodesk

With its AutoCAD design software, Autodesk transformed the way that ideas are turned into products. To maintain the company's leadership position, some 400 Autodesk developers work continuously to enhance AutoCAD. By providing an early release of the Microsoft Visual Studio 2010 development system to these developers, the company is saving resources, boosting productivity, and maintaining compatibility for partners.

Business Needs

Autodesk is a world leader in two-dimensional and three-dimensional design software for customers in manufacturing, building and construction, media and entertainment, and other industries. AutoCAD, the company's flagship product, is among the most widely known and used of all computer-aided design applications.

To reinforce its leadership position and deliver ever more functionality to its customers, Autodesk maintains an AutoCAD development team of several hundred software professionals on three continents. This team faces all the challenges common to any large software-

development endeavor, and, until recently, three of those challenges were particularly daunting.

The first challenge, according to Albert Szilvasy, Software Architect at Autodesk, was implementing more centralized control over the property settings that individual developers could make on the compiler and other tools. "Developers need flexibility to work creatively, but when everyone is making their own modifications, you get inconsistent results," Szilvasy says. "With more than 1,500 C++ projects in our build repository, this happened frequently, wasting time and effort."

The second challenge was ensuring reliable and repeatable builds. "With such a large build repository, our dependency tracking had to be flawless," Szilvasy says. "But there was no way to ensure that external build tools could be integrated into the build system without breaking their internal dependency-tracking logic. Consequently, we had to do a clean build every time a significant change was made to any component, which meant it could be as long as a couple of hours before developers received feedback."

The third challenge was maintaining backward compatibility for more than 4,000 partners that provide add-ins to AutoCAD and customized applications on top of it. "These third-party providers rely on our APIs [application programming interfaces], and we need to ensure that their experience does not change when we change tool sets internally," Szilvasy says. "This meant we often had to wait for them to adopt a new tool set before we could do so ourselves, delaying our ability to take advantage of new features for making our team more productive and our product more powerful."

Solution

Having long worked with the Microsoft Visual Studio development system and the Microsoft .NET Framework, Autodesk executives decided to address their development challenges by implementing an early version of Visual Studio 2010 Ultimate. Now, Autodesk developers are taking advantage of new support within the Microsoft Build Engine (MSBuild) and larger build system for C++—the language of more than 80 percent of the 11 million lines in the AutoCAD code base—to implement global settings for development tools.

The developers also are using MSBuild and its support for the integration of external build tools to address longtime challenges

of dependency tracking. In addition, they are taking advantage of native multitargeting—the ability of Visual Studio 2010 to target earlier versions of the Visual C++ compiler and linker—to make improvements to AutoCAD without creating compatibility problems for partners.

Benefits

With its upgrade, Autodesk has achieved centralized control over compiler and tool settings for a more structured and predictable development environment. The company is resolving dependency-tracking issues so that developers can perform incremental builds, saving time and resources. The company also is using multitargeting to ensure compatibility for third-party add-in and application providers even when those providers delay tool upgrades.

Control, Reliability, and Repeatability

According to Szilvasy, the Visual Studio 2010 enhancement that arguably makes the greatest difference for Autodesk is the support for C++ in MSBuild and the larger build system. "We now can implement global policies for property settings, so our build is significantly more reliable and repeatable," Szilvasy says. "We no longer waste time tracking errors related to inconsistent settings."

Because MSBuild now supports C++ as well as the languages and tool sets that it supported before, Autodesk developers can use that single technology to handle the diverse array of files and file types that make up a typical AutoCAD build, including not only C++ but also C#, LISP (List Processor), and other languages. As Szilvasy explains, "We save time now that we no longer have to maintain custom build tools to handle the various languages."

Higher Productivity, Lower Costs

For Szilvasy and his colleagues, MSBuild is also making a big difference through its internal dependency-tracking logic. "Developers can now perform incremental builds, resulting in a tighter feedback loop that enables them to see the results of changes while they are still top of mind," he points out. "This enhances the developers' productivity and their ability to try out new ideas."

Faster builds will help Autodesk optimize resource utilization in its build farms. "By performing incremental builds instead of clean ones, we can reduce the average build time from two hours to just 30 minutes," Szilvasy says. "This will help us reduce wear and tear on the hardware and lower our power and cooling needs, saving money and lessening our environmental impact."

Compatibility with Partners

With the multitargeting capability of Visual Studio 2010, Autodesk can enjoy the benefits of using the new technology without creating compatibility problems for its third-party partners. "On our C++ APIs, we assure third-party partners that an application or add-in written for one release of AutoCAD will work for the prior two releases of the product," Szilvasy points out. "With Visual Studio 2010, we can maintain this assurance, and that is critical to our partners."

Moreover, Szilvasy adds, the partners' customers, which are also Autodesk customers, will be more likely to upgrade to a new release of AutoCAD because they know their third-party add-ins and customizations will work. "This makes good business sense for our partners, and good business sense for Autodesk, too."