



Integrating Autodesk AutoCAD[®] and Microsoft SharePoint[®]

Enterprise Drawing Management and Collaboration

White Paper

Winter 2009

Summary

CADnection provides a seamless integration between Autodesk AutoCAD and Microsoft Office SharePoint Server (MOSS) as well as Windows SharePoint Services (WSS). It is specifically designed to allow drawings, reference files and related data to be saved and managed in SharePoint.

AutoCAD users interact with SharePoint directly from within AutoCAD. As a result, CADnection leverages the strengths of SharePoint to ensure file data integrity, maintain file relationships and structure, facilitate revision management and support workgroup collaboration activities.

CADnection specifically targets organizations that are planning to or have standardized on SharePoint. Additionally, CADnection adheres to the native .NET framework defined by Microsoft and adopted by Autodesk.

This white paper is organized to provide an in depth overview of the CADnection solution, its features and implementation considerations.

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Introduction

CADnection facilitates the seamless integration between Autodesk AutoCAD and Microsoft Office SharePoint Server (MOSS) as well as Windows SharePoint Services (WSS). It is specifically designed to allow organizations to leverage the strengths of SharePoint as a data/file repository and collaborative environment for AutoCAD users.

This seamless integration allows AutoCAD users to easily check-in and out drawings and reference files, save designs and lock folders to the SharePoint environment. SharePoint users see drawings as any other SharePoint documents. These drawings can be searched upon, viewed and launched into AutoCAD. Capabilities such as “where-used” and “composed-of” are also readily available.

CADnection adheres to the native .NET framework defined by Microsoft and adopted by Autodesk. As a result, organizations are able to maintain the unique functionality and strengths of each application.

AutoCAD or SharePoint users are able to manage content and data in a way that allows them to quickly access information, reuse it, edit it, and create updated versions. This solution saves valuable time and resources which allows for designers, developers and CAD operators to focus on designing products that their company can sell and support. Ultimately, CADnection is an easy-to-use and efficient solution that drives improved productivity, product quality and time to market.

This white paper is organized to provide an in depth overview of the CADnection solution, its features and implementation considerations.

AutoCAD and SharePoint Working Together

CADnection is specifically designed for organizations seeking a robust and easy-to-use MOSS or WSS integration with Autodesk AutoCAD. The beneficiaries of CADnection and the value it brings to the various user communities are as highlighted below.

AutoCAD Users

AutoCAD users and administrators benefit by inheriting SharePoint's content management capabilities. This includes access controls, locking and unlocking drawings and reference files as required, revision management, where-used information, and extensive collaboration and workflow capabilities.

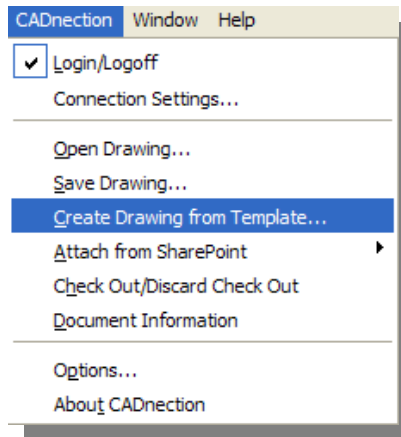


Figure 1
SharePoint Access and Operations within AutoCAD

While in AutoCAD, users can quickly search and retrieve drawings based on its metadata and/or content leveraging the SharePoint search capabilities.

SharePoint Users

Drawings and reference files are saved and maintained as any other file or document in the SharePoint environment.

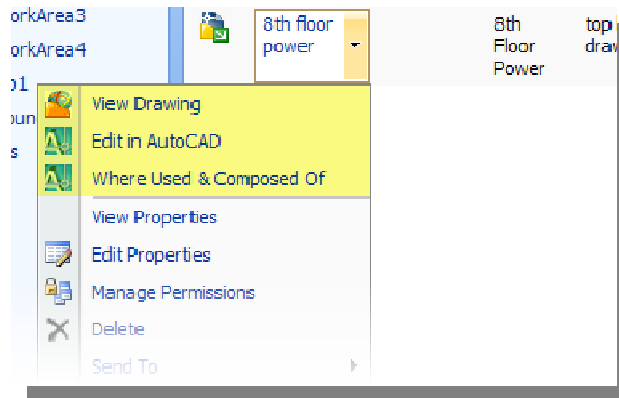


Figure 2
Operations within SharePoint

SharePoint users and administrators are able to leverage a common repository, content management conventions and policies, and collaboration and process activities. Users are allowed, with appropriate access rights, to edit title block characteristics, support versioning, and initiate change control processes and release operations.

IT Operations

IT organizations benefit by having a single repository and solution to manage, maintain and backup files as drawings are now part of the SharePoint.

Benefits

CADnection unifies the strengths of AutoCAD and SharePoint. The derived benefits will be reflected in improved productivity, product quality and time to market. Attached to all of this is reduced maintenance, support and ultimately a lower cost of ownership.

Increased Productivity

- seamlessly integrates design, collaboration and knowledge management
- easy access to AutoCAD drawings, related data, relationships, and status
- improved team work via workflow and the virtual team meeting capabilities of Microsoft SharePoint
- minimal training and immediate usability

Improved Product Quality

- controlled and secure access to sensitive and/or expensive-to-produce drawings
- avoid duplication of effort via check-out and check-in guided-wizards
- visibility to drawings, revisions, title blocks, reference files and their relationships
- manage drawings revisions and stages

Reduced Time to Market

- streamline business processes to support drawing change and release cycles
- manage complex relationships between drawings
- improved decision-making via knowledge management and collaboration strengths of SharePoint

Product Features

Features within AutoCAD

Drawing Access within Autodesk AutoCAD

Users are able to store and retrieve their data directly from Microsoft SharePoint without leaving AutoCAD.

Access Controls

Users are able to log into SharePoint with the support of both domain and forms based authentication methods.

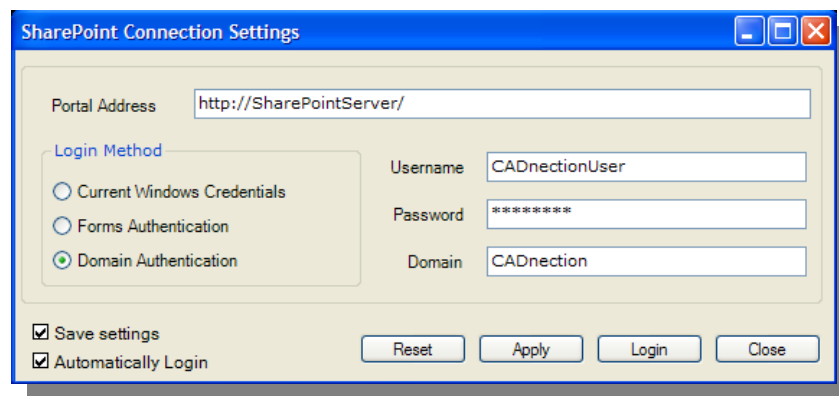


Figure 3
Logging into SharePoint from within AutoCAD

As users log in, they select the Global User Setting defining default settings within their session.

Checking In and Out Drawings

Wizards guide users through the necessary steps to get drawings and all their references in and out of a SharePoint document library. Saving new or updated drawings or access to existing drawings are based on the defined Vault location. During this process, drawing entity tag/values can be mapped to SharePoint document properties.

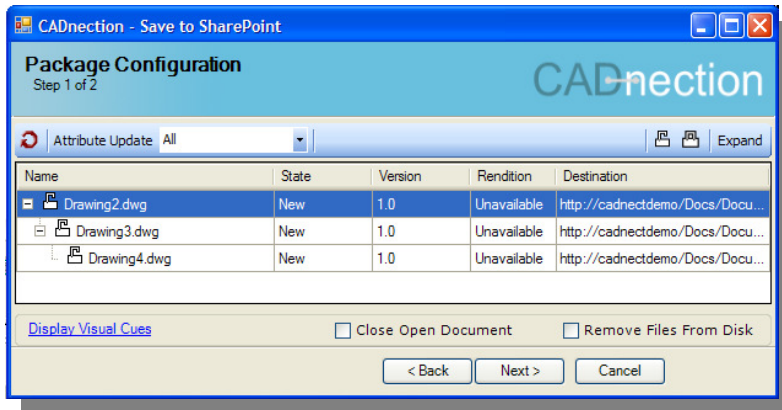


Figure 4
Drawing Check-in and Check-out Dialog

CADnection ensures complete file integrity during the check-out and check-in processes. During the check-out process, users have the option to copy reference files out with the primary file and set lock or unlock flags. During the check-in process, CADnection analyzes the drawing and updates the reference file relationships. The information is immediately visible to other users in SharePoint.

Lock/Unlock

As a drawing is checked out of SharePoint, a user has the ability to reserve the file to prevent other users from editing the file. During the check in process, the user is able to unlock the drawing to make it available for other users to modify. Drawings may also be locked or unlocked at anytime while the drawing is open in AutoCAD using CADnection.

Start New Drawing from Template within SharePoint

New drawings can be started from a template file located within the Template file location defined in SharePoint.

Insert Drawing Blocks

Drawing blocks can be directly inserted into a drawing along with title blocks from the Vault location.

Attach New Document

Attach any raster image or drawing located in a Vault directly into an active drawing.

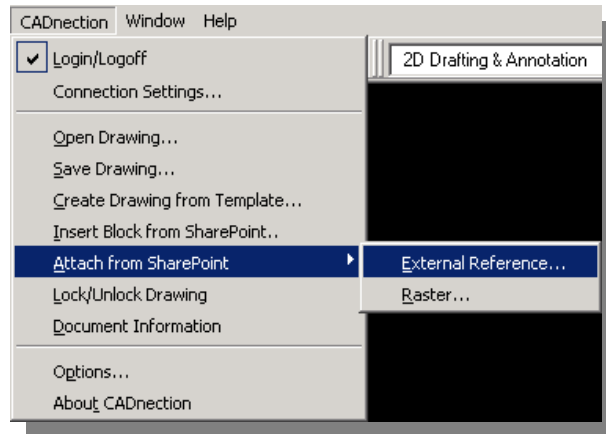


Figure 5
Attach Drawings from SharePoint within AutoCAD

Features within SharePoint

Integrated AutoCAD Editing

Edit drawing mapped attributes directly within the SharePoint document properties page.

AutoCAD Drawing Operations

AutoCAD file operations can be directly accessed within SharePoint by starting a new drawing from a template drawing, check-out, or simply launching AutoCAD.

Reference File Visibility

CADnnection combines the power of SharePoint's content management platform with an extended data structure that is specifically designed to treat AutoCAD reference files. As a result, the data integrity of AutoCAD drawings and reference file relationships is ensured and users have complete visibility into these relationships both in and out of the AutoCAD application.

As users check-in drawings into SharePoint, CADnnection automatically establishes or updates drawing and reference file relationships accordingly. An

integration feature also provides users with the ability to see "where-used" and "composed-of" relationships for any given drawing through multiple levels.

Name	Version	Is Latest	Path	Status
8th floor plan.dwg	1.0	False	/Docs/Documents/WorkArea2/WorkFolder/	CADNECTDBMO\Administrator
8th floor furniture.dwg	1.0	False	/Docs/Documents/WorkArea2/WorkFolder/	CADNECTDBMO\Administrator
8th floor power.dwg	1.0	False	/Docs/Documents/WorkArea2/WorkFolder/	CADNECTDBMO\Administrator
8th floor power.dwg	1.0	False	/Docs/Documents/WorkArea2/WorkFolder/	CADNECTDBMO\Administrator

Figure 6
Drawings "Where-Used" and "Composed-Of" Report

CADnection's reference file management and visibility capabilities also benefits SharePoint users. In combination with SharePoint's collaboration capabilities, organizations can establish change-management processes that permit users to assess the impact of change without direct access to AutoCAD.

View Drawing

Within SharePoint, a user can go to a drawing record and view a rendition (DWF or PDF for example) of the drawing without the need for AutoCAD.

To facilitate the "viewing" of AutoCAD drawings within the SharePoint environment, CADnection supports the use, management and operations of the Autodesk DWF format. DWF is Autodesk's "design web format" and is a rendition of an associated AutoCAD drawing (DWG).

DWF files can be viewed via Autodesk's Design Review product. Design Review is available at no cost and can operate standalone or it can be integrated with solutions such as SharePoint.

To highlight the DWF file functionality of CADnection, a typical "day in the life" experience of AutoCAD and SharePoint users is further addressed below.

AutoCAD Check-In/Save Operations

Prior to checking in a drawing, the user has the option to "publish," "export," or "plot" the active session drawing to a DWF format. The resultant file is saved in the same work area as the active drawing.

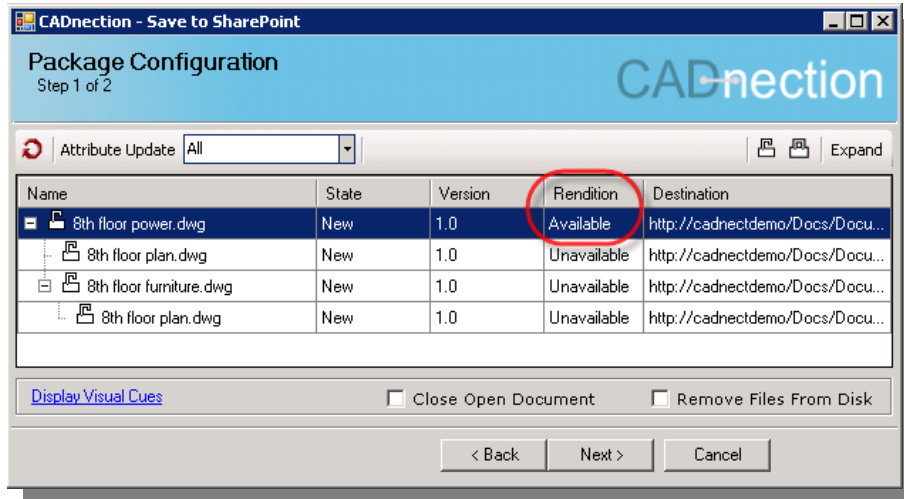


Figure 7

Managing Viewable Formats during the Check-in Operations

Upon checking in the drawing back to SharePoint, CADnection automatically identifies the availability of the DWF file that will accompany the parent drawing in the check-in process. The availability of the DWF is presented in the check-in wizard.

Saving the DWF File in SharePoint

During the check-in process, CADnection saves the DWF file and links it as the "viewable" file associated with the drawing. If a previous DWF file rendition exists in SharePoint it is overwritten to reflect the most current version.

Accessing the DWF File in SharePoint

The function menu available from the desired drawing brings up the various file options and/or operations. One of these options is the "View Drawing" operation. Upon selecting this operation, Design Review is launched in a separate browser and the DWF is presented. The range of Design Review operations is available in this session.

Administration

Global User Settings

The Global User Settings (GUS) provides a powerful management tool. The various setting are further discussed below

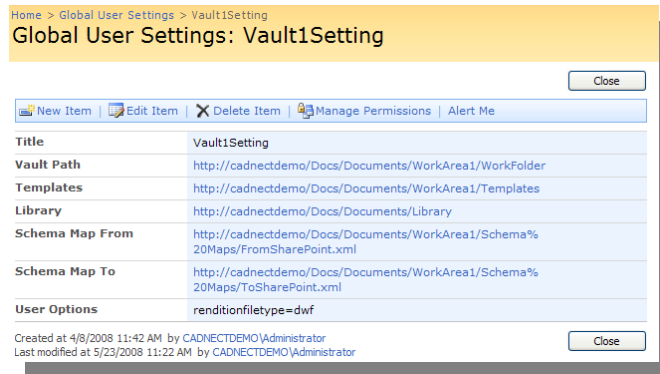


Figure 8
Global User Settings

There is no limit to the number of GUS values that can be made. From the CADnection menu, inside AutoCAD, a user can select from any GUS that they have access to so that their files will be directed accordingly.

CADnection Vault

This is a library location within SharePoint identifying where CAD files and XREFs will be stored.

Template File Location

Within this location, .dwt files can be stored to allow users to utilize template files when creating a new drawing.

Schema Map Location

The Schema Map provides the mapping between the AutoCAD entity tag (block attribute tags) and SharePoint document properties. These are used to update SharePoint and the AutoCAD file during the check in/check out process, respectively.

Library File Location

Within this location, standard drawings are maintained.

Access Rights

By utilizing a SharePoint access control list, administrators can apply native SharePoint permissions to individual vaults.

Deployment Considerations

Requirements

- CADnection Server
- Windows Server 2003
- Microsoft Office SharePoint Server 2007 or Windows SharePoint Services 3.0

CADnection Client

The CADnection client supports the following client configuration:

- Windows XP Professional or Vista
- .NET Framework 2.0
- Screen resolution of 1024x768 or higher
- AutoCAD 2007 and above

CADnection Server

CADnection provides users with CAD file management functionality within a CAD product. It also provides the ability to relate CAD Documents together, supports SharePoint attribute updating, and CAD product property updating. The CAD Document stores the CAD file checked in from the CAD Application.

Typical Installation Sequence

- Ensure that the system requirements are met
- Install the CADnection server components on the SharePoint Server
- Configure Microsoft Internet Information Service (IIS)
- Create the Global User Settings list area and fields
- Create a Global User Settings item
- Deploy the DWF Viewer Web Part (optional)
- Create the "CADnectionVersionGUID" column to the document site you will be working in
- Add the "CADnectionVersionGUID" column to the area in SharePoint where you will be storing the AutoCAD files

CADnection Client

CADnection enables Autodesk AutoCAD users to continue using their AutoCAD application and provides the full document management functionality of SharePoint. For AutoCAD users, the CADnection client is called within the

AutoCAD application via an add-in menu, providing easy access to the documents maintained within SharePoint. Within SharePoint, users are able to track versions and identify who has modified documents.

Typical Installation Sequence

- Ensure that the client system requirements are met
- The CADnection server must be previously installed and configured
- Verify the Windows account has local Administrator permission
- Install the CADnection client via the install wizard
- Configure the connection and workspace settings

About CADnection

CADnection was launched in early 2007 and operates as a business unit of The vdR Group, Inc. (www.vdR.com). The people behind the solution have many years of experience with integrating Autodesk products as well as other data and content management oriented applications. The features and functionality of CADnection are reflected in the solution's ease of use, configurability, and "party line" technology usage. This includes leveraging native AutoCAD integration components, .NET, web parts and native Microsoft SharePoint.

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