DNN Platform Simple Webfarm Configuration Overview

Version 01, July 2020

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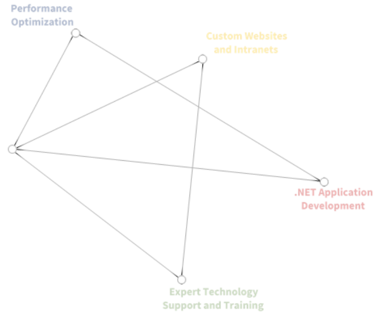
Contents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The Purpose of This Document

This document was created to provide an overview configuration for installation of DNN Platform version 9.6.0 and later in a simple web-farm environment. This document outlines a few options and configurations and is only provided for guidance purposes. The primary goal of this document is to highlight the configuration requirements, including those often overlooked when configuring DNN Platform to operate inside of a Multi-Server environment

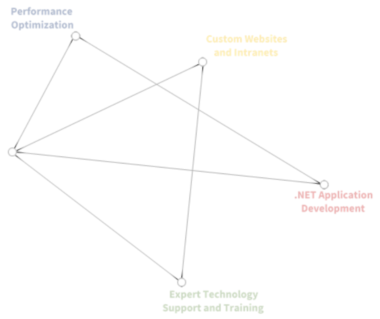
Who Should Use This Document

This documentation is intended to be used by individuals with the technical skills and systems permissions to create and configure a mult-server website hosting environment including the requisite SQL Server installations.

Readers should exercise caution when implementing the recommendations in this guide, as incorrect implementations could result in additional security issues or system downtime if not implemented correctly. IowaComputerGurus provides no warranty of guarantee with regards to the guidance contained herein, please refere to the “Disclaimer” at the end of this document for more information.

Document Revision History

Rev. Date	Notes
07/09/2020	First public release, Version 01.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DNN Platform Web Farm Support Overview

Starting with DNN Platform Version 9.6.0 the platform was shipped with a "SimpleWebFarmCachingProvider" allowing the platform to be used in multi-server environments without any additional third-party solutions or tooling. This implementation, as indicated by the name, is a simple implementation and has a few key limitations/requirements that will make the solution work for most users, however, not all environments or configurations will be supported.

This caching provider is the key element that provides the ability for DNN to work in a multi-server environment, but there are other features & configurations as well. The caching provider, and behavior however is the most critical to understand how/why DNN works the way it does.

Caching Behaviors

DNN Platform provides two high-level caching configurations out of the box, and properly understanding these elements will help understand the inner workings of the configuration.

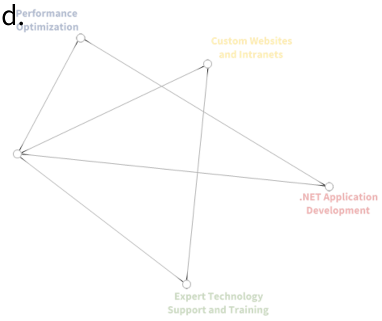
Single Server/Default

Traditional installations of DNN Platform will utilize either a "Memory" based caching provider or a "File" based caching provider. These two models have been around in the DNN Platform since at least early 3.x versions. For resource constrained sites it is possible to utilize the File based provider, for all other installations, and the default for new sites, the memory-based provider will be utilized.

This cache is utilized by DNN internally to reduce load on the servers and to provide faster responses to the users by caching critical elements of data. Some of these items include:

- ***The listing of Tabs (Pages) on the portal***
- ***A listing of all Portal Alias values***
- ***Permissions for Modules/Pages***

These items are automatically cleared by the DNN System without any additional interaction from the user. If you utilize DNN in a default configuration with more than one server you will often see issues such as missing pages, or outdated information from the old cache not being cleared.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Utilizing Simple Web Farm Caching

The Simple Web Farm Caching Provider provided in DNN optionally provides a mechanism whereby when an item is removed/refreshed in the cache on a single server it will send a notification to all other servers that they also should remove the item from the cache.

Internally on each of the servers the application retains a Memory based cache for the best performance under the assumption that those in a multi-server environment are looking for the best overall performance.

Third-Party Solution

When discussing these solutions, it is important to note that there are additional third-party caching provider solutions that exist to fill this void. These include ones that provider support for Redis (Out of Process) and similar. These solutions are outside of the scope of this document.

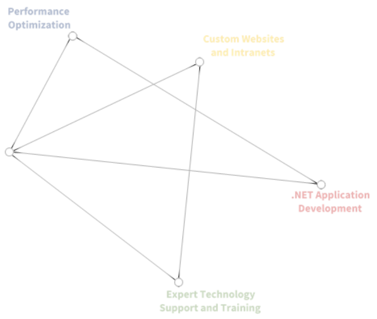
Hosting Requirements for Multi-Server

Given the nature of communication with the Simple Web Farm Caching Provider, as well as other limitations within the DNN Platform there are a few key requirements that must be met within an environment to properly run DNN Platform in a multi-server environment.

Uniquely Named Servers

Internal to the DNN Platform the Scheduling system uses the “Server Name” to limit tasks from executing on multiple servers, to ensure that an environment can support disabling those tasks that should not execute multiple times the names of all servers participating in serving the website should be static and un-changing so that individual tasks can be configured to execute only once. Later in this document we will outline the proper configuration for those tasks.

> *It is important to note that this limitation means that solutions such as Azure App Service’s “Auto Scale” will not result in expected behaviors.*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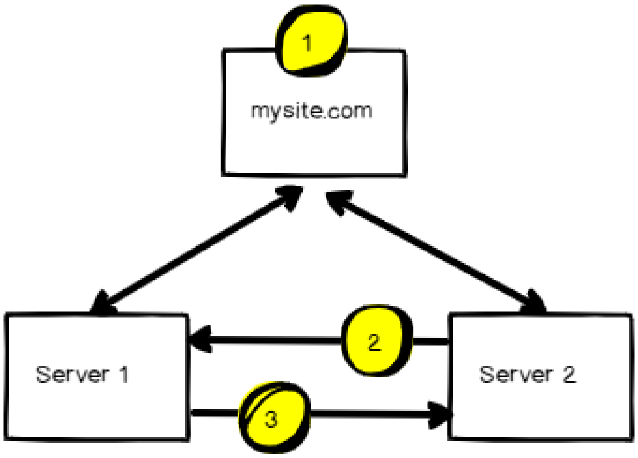
Individual Server Access

Given that the DNN Platform requires direct server-to-server communication it must be possible for the application to communicate directly between each node of the environment. Consider the following diagram.



1 Indicates the load balancer that will be utilized for serving requests to the user. This can be a software or hardware load balancer. The key consideration is that it will be responsible for taking requests for your website and distributing them to the individual servers in the farm. There is NO need for Sticky Sessions or similar to be enabled for default DNN Platform functionality to be enabled.

Pathways **2 and 3** indicate the individual server access that is required. These communications are the cache expiration notices that are sent between the servers. This can be done using DNS names such as “site1.mysite.com” or based on the actual IP address of the server. The only consideration is that you MUST configure a binding within IIS for the communication to get to the DNN Process.

NOTE: You do NOT need to have this IP address or URL set as a portal alias within the application, however, it can be helpful for per-server diagnostics.

If you do not have an ability to facilitate this configuration you will not have a stable solution.

File Synchronization or Network Share

Day-to-day operations within the DNN Platform result in changes to not only the SQL Server database but additionally files are uploaded and changed on a regular basis within the portal installation. Given this configuration you must either utilize a mounted network drive, or implement some sort of file synchronization between servers using tools such a Windows built-in DFS solution or other third-party solutions.

During the configuration steps outlined below we will document directories that can be excluded from this synchronization or those configuration values that need to be changed.

Hosting Environment Configuration

Now that we understand the high level requirements for load balanced deployments of DNN Platform and how the platform will interact we can proceed with the setup of the hosting environment itself, focusing on the steps necessary to prepare the SQL Server as well as the IIS Servers.

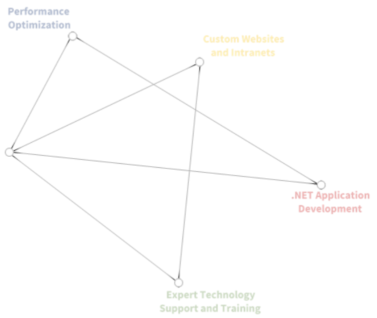
SQL Server Configuration

By default, load-balanced configurations of DNN Platform do not require any additional steps to be completed at the database level. DNN Platform will work perfectly fine with ANY form of high-availability configuration supported by SQL Server. It is suggested that when adding redundancy to the front-end services at a minimum a two-server cluster be added for SQL Server in the backend for additional redundancy.

Database & User Creation

DNN Platform requires a Single SQL Server database for operations and a single SQL Server user account to be utilized in the connection string. The choice of Active Directory or SQL Server based user accounts is at your discretion, simply ensure that the created user account has DBO permissions to allow DNN to support installation, update, removal of extensions and otherwise.

> *Limiting SQL Server Permissions from DBO is possible, however, can have unintended consequence as there are multiple user interaction and even backend processes that do more advanced SQL operations that might fail if the user account is not granted DBO permissions. Items such as Module Installation or Upgrade and DNN Platform upgrades are at the most risk.*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Web Server Configuration

There are multiple components to the Web Server configuration and your individual policies and procedures will need to be applied to these elements. Ensuring proper Folder Permissions within your IIS Installation is beyond the scope of this document however careful consideration should be taken.

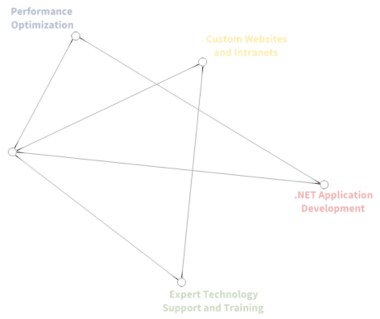
Application & Application Pool Setup

Each server in the web-farm should have the same configuration with regards to the application as well as the application pool within IIS. The following are high-level requirements that should be met, regardless of if you are utilizing a network share or replication process.

- Application Bindings
    - Minimum bindings should include the unique server address discussed before and the website address
- Application Pool Configuration
    - .NET 4.7.2 and later must be installed, this is enabled using the .NET 4.0 selection on the application pool
    - Integrated Pipeline Mode
    - 32 Bit Applications should be disabled
    - Idle Timeout – We suggest updating this value from the default 20 minutes to a larger value
    - (This requires the ASP.NET & .NET 4.7.2 Feature to be installed into already done so)
- Default Documents
    - We recommend only having default.aspx as a default document for the best security possible.
- Service Account
    - The service account utilized should have FULL Control over the website content directory. Additional care and consideration should be taken to ensure that the user account does not have permissions outside of the application directory.

IIS Logging Configuration

While configuration is being completed here, we do suggest that IIS Logs be retained with a minimum retention period of 30 days for support/audit and other validation processes.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DNN Installation

With the Web Server created & configured as well as a blank SQL Server database we are ready to start the installation process for DNN Platform. The steps below will outline the OPTIMAL process for doing an initial setup in a web-farm environment ensuring and working multi-server from the beginning. If taking an existing installation and migrating to a load-balanced environment you can adapt these steps to your particular situation.

Prepare DNN Installation Files

For best results it is necessary to complete adjustments to the web.config file included with DNN Platform prior to starting the install sequence. After downloading the Install.zip from GitHub unzip it to your destination (Local or Network Share) and open the web.config for editing.

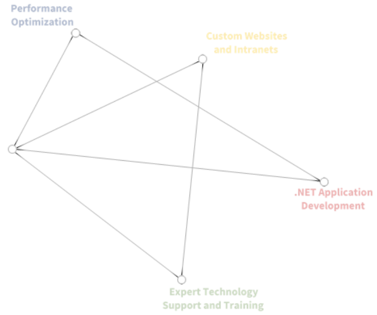
Once open at the very bottom of the document you will see a section for <compositeFiles> with a section that is commented out with a note that for “Web Farm Configurations” you need to swap the values. Follow the instructions in the configuration file to adjust for web farm support. This step is necessary to ensure that once the Client Resource Management functionality is enabled you will have proper support.

Skipping this step will not cause immediate issues. However, if you don’t make this change and subsequently enable “Composite Files” after installation, you can get unexpected errors and will have an environment that will require multiple restarts to clear the cache of invalid items.

Install DNN Using the Wizard

Once you have updated the web.config you can install DNN utilizing the installation wizard as you would with any other version of DNN including the definition of host users, template, etc.

Once the installation is complete do not attempt to add pages or make other changes that will leverage the caching sub-system as you will not yet be fully configured.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Enabling Web Farm Caching Provider

Once the installation is complete ensure that traffic has visited the website to all servers within your environment. Doing this will result in each server spinning up and entries being written to the WebServers table within the database. Once this is complete you can complete the setup of the Web Farm Caching Provider and continue with DNN configuration.

Validate WebServer URLs

After visiting the site from all servers execute the following SQL Statement against the DNN database

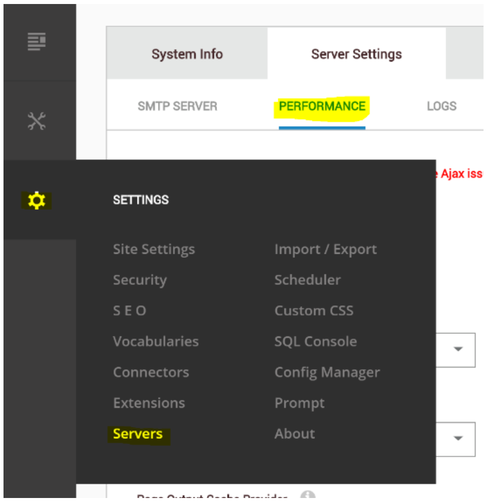
```
SELECT ServerId, ServerName, LastActivityDate, Enabled, Url
FROM WebServers
```

This will provide a listing of all servers in your environment, validate the information in the **Url** column. This should contain a unique value for each server within the environment and requests to that URL form other servers in the farm should return content.

> *You can test this configuration on the server by visiting [URL]/Keepalive.aspx, if you see the current date/time the URL value is properly resolving to the server in the farm.*

Enable Web Farm Caching Provider

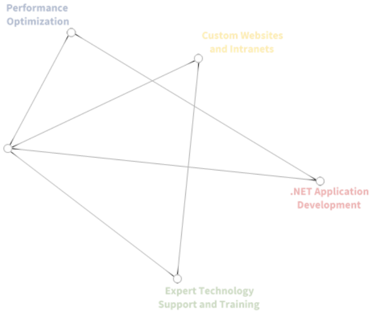
Once you are sure that the servers are listed and configured properly, you can enable the proper caching provider.



This setting can be found from “Settings” -> “Servers” -> “Performance” within the Persona Bar when logged in as a Super User account.

The drop-down for “Caching Provider” should be changed from the default “FileBasedCachingProvider” to “SimpleWebFarmCachingProvider.”

Once changed select the “Save” option at the bottom of the screen. Then, to ensure that this setting has been picked up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by all servers within the farm, click the 'Restart Application" option from the upper right to ensure that DNN forces an application restart.

From this point forward basic content management functionality should be working properly.

Validate "Admin Logs" as Empty

Once the application has restarted you will want to review the "Manage" -> "Admin Logs" section of the website to ensure that you are not seeing any recurring errors. The types of errors most commonly visible are communication issues between the individual servers and otherwise.

Restriction of Scheduled Tasks

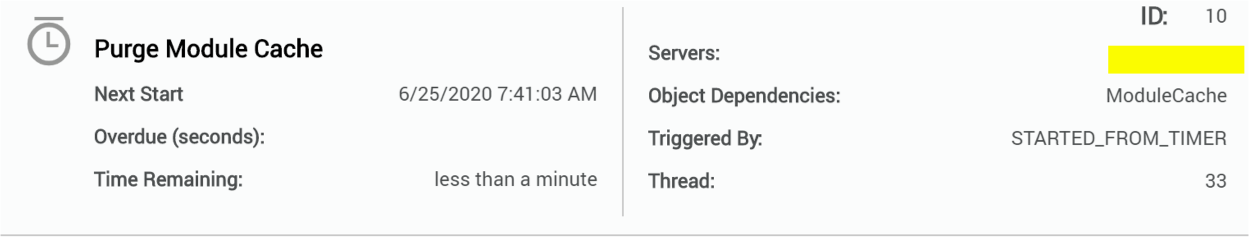
The final steps of configuration are to configure scheduled tasks to ensure that they are executed in a manner that is appropriate for their purpose.

Determining Configuration Need

By default, all scheduled tasks will execute once per configured time period, per server. This is acceptable for those tasks that are doing items that need to be completed on each server. For example, the scheduled tasked used to purge the Event Log Buffer for writing event log information should be executed on all servers to avoid missing any critical log entries. However, items such as website search index that operate over the entire application should be executed on a single server to avoid race conditions.

Management of "Run on Servers"

Within the Scheduler, accessed via "Settings" -> " Scheduler" you will see a running history of executed jobs.



Purge Module Cache

Next Start	6/25/2020 7:41:03 AM
Overdue (seconds):	
Time Remaining:	less than a minute

ID:	10
Servers:	[redacted]
Object Dependencies:	ModuleCache
Triggered By:	STARTED_FROM_TIMER
Thread:	33

As you can see the “Servers” section is blank for all of the default items. You can change these values from the “Scheduler” tab on this page by editing each individual item.

Changes to Default DNN Tasks

The following tasks within the default DNN Installation should be adjusted to execute on a single server.

- Messaging Dispatch
- Purge Deleted Users
- Purge Schedule History
- Search Site Crawler
- Send Log Notifications

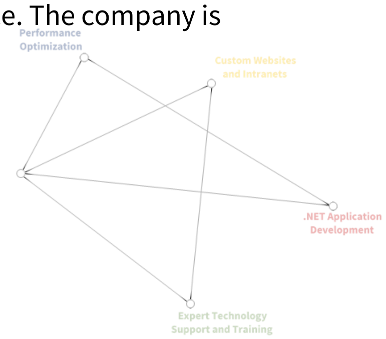
Some individuals like to execute all of these tasks on a single server, others like to share the load. There is no right or wrong answer to this configuration. The key is to restrict these tasks to a single server only. When editing the item simply place the NAME of the desired server in the value for “Servers”. You can obtain the values from the previously mentioned query.

Summary

Although slightly undocumented and limited with regards to server configuration, you can quickly setup a DNN Platform environment on a multi-server environment by following these simple steps. We anticipate continued enhancements to DNN Platform in the future to improve the support for multi-server configurations. As an open-source project much growth is driven by community involvement.

About IowaComputerGurus Inc.

IowaComputerGurus Inc., a Microsoft Certified Partner organization specializes in developing custom solutions using the Microsoft .NET development stack and leading Content Management Systems. Based in Ankeny, Iowa, they provide services to customers all over the world and base their business on providing quality, affordable technology solutions with the best customer service. The company is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led by Mitchel Sellers, a Microsoft MVP, AP.Net Insider, Microsoft Certified Professional, DNN MVP, and published technology author.

Contacting IowaComputerGurus

IowaComputerGurus, Inc.
PO Box 737
Ankeny, Iowa 50021

Phone: (515) 270-7063
Fax: (515) 866-591-3679
Email: support@iowacomputergurus.com
Website: http://www.iowacomputergurus.com

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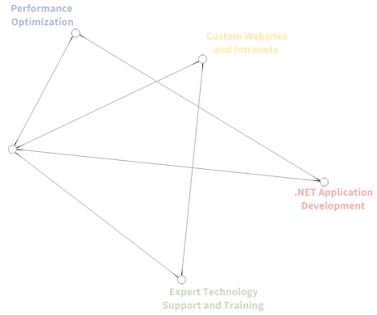
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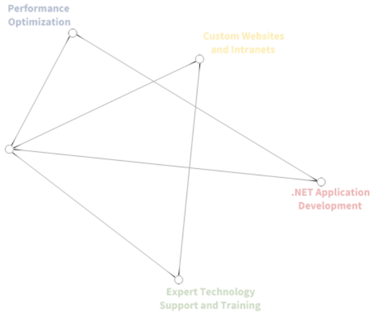
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