Load Balancing and Clustering in EPiServer

Abstract

This white paper describes the main differences between load balancing and clustering, and details EPiServer's possibilities of existing in a clustered infrastructure.

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Introduction

Load balancing is often required when building solutions that handle large volumes of client requests or that have high demands on security and redundancy. EPiServer fully supports load balancing, for session handling, cache and common files. For more technically detailed information about EPiServer, see EPiServer Operator's Guide. See Microsoft's Web site for information about clustering in the Windows environment.

Note A standard EPiServer installation is normally enough from a performance point of view. Load balancing is only required when the Web site experiences very heavy traffic.

Clustering and Load Balancing

There is some confusion surrounding the concepts clustering and load balancing. This chapter concentrates on defining the differences between the two technologies.

Clustering

Clustering is an alternative when it is important to minimize downtime and high redundancy in a solution, and is preferably used in business-critical applications, such as databases and e-mail servers.

Reliability is high in a clustered solution; at least one server handles the incoming requests for the clients and fetches its data from a common disk, which is accessible from the other servers in the cluster. If the active server fails for some reason, another server in the cluster takes over the requests without it greatly affecting the end users. This process is called failover.

A server cluster is a collection of physically independent servers with one collective storage area. Clustered servers are physically connected to each other with cables, and are logically connected with the cluster software. The clusters do not need to have identical hardware or configuration.

Clients sending requests to the cluster see the cluster as one unit, where it is not possible to differentiate between the different nodes.

Figure 1 Clustering services secure availability by letting one of the servers take over from another server at failover.
Load Balancing
Load balancing or Network Load Balancing (NLB), which distributes incoming traffic through a network of connected servers, should be seen as a complement to clustering.

Load balancing balances the load of incoming network traffic and distributes the requests to the servers that best can handle them. Load balancing is mainly used for scalability and performance reasons. If you want to scale the solution, new servers can be added to the cluster as required.

In a load-balanced environment, you set up at least 2 servers that handle incoming requests from the clients.

![Diagram of load balancing](image)

*Figure 2 The load balancing distributes incoming requests to a group of servers.*

Combine Clustering and Load Balancing
Large scalable system solutions can be built using both clustering and load balancing, by balancing the loads in a so-called Web server farm and building a cluster of the mission-critical systems, e.g. the database. This results in high availability for the database and high scalability for Web servers.
Configuration of the Environment

Configuration and dimensions of a cluster for EPiServer is unique for every customer. Some of the factors that can affect this are, for example, expected workload, required reply times, and calculated time for unplanned downtime. These areas are not covered in this document. Further information about this can be found on Microsoft's home page for clustering services, http://www.microsoft.com/windows2000/technologies/clustering/default.asp.

It is important to note that SQL servers can only support clustering and cannot be load-balanced. You should, therefore, plan for upgradeable hardware, if you expect the workload on the database to be high.

EPiServer in a Clustered Environment

When building a load-balanced EPiServer solution, the Web servers and database must be stored separately, as SQL Server cannot be load-balanced. Refer to EPiServer Operator's Guide for information on how to configure EPiServer to support load balancing, with reference to caching and file management.

Files

To avoid different file setups, set up the Web site so that the Web servers read files, documents, etc. from a common file server, which also serves as an upload area for editors.
Cache

As soon as the cache is changed on one of the servers in the cluster, the other servers in the cluster must also be notified of the change and update their own cache. For this reason, each server in the cluster must know about the other servers. These notifications occur via Web service requests between Web services in the cluster.


Schedules

In order to avoid collision between the scheduling services on the nodes in the load-balanced cluster, the list with command jobs is checked in the common database. This means that "first come, first served" applies for the different processes. It is also possible to let the scheduler exist on only one node, but then the objects must be identical on the different nodes.

Access Rights and Authorities

For access rights to work correctly and for all the nodes in the cluster to have access to the common file area, it is necessary to let the ASPNET account run under a user account with access rights to the common file area, so-called impersonation. This is achieved by changing the following in web.config:

```
<identity impersonate="true" userName="domain\user" password="pass"/>
```

With this line included, all the anonymous users will be run under the stated account, which will then have access rights to the common file area.

Conclusion

EPiServer works well in a Windows environment with Clustering Services from Microsoft, from both a performance and scalability point of view. The best results are achieved after careful preparation with the organization, so that the load-balanced environment is configured to best meet the expected workload and security requirements.
Experience tells us that a standard EPiServer installation is, in most cases, enough to handle heavy user workload. Clustering and load balancing can be used as a complement, when customers have high demands on performance and redundancy.