



WHITE PAPER

Multiple Server Instances using ColdFusion MX 7 Enterprise Edition

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Contents

- Introducing Multiple Server Instances in ColdFusion MX 7 Enterprise Edition.....1**
- The Difference Between Single Server and Multiple Server Instances..... 1
- The Benefits of Multiple Server Instances2**
- High Availability 2
- Enhanced Security..... 3
- Optimized Applications 4
- Clustering..... 4
- Conclusion.....5**

Introducing Multiple Server Instances in ColdFusion MX 7 Enterprise Edition

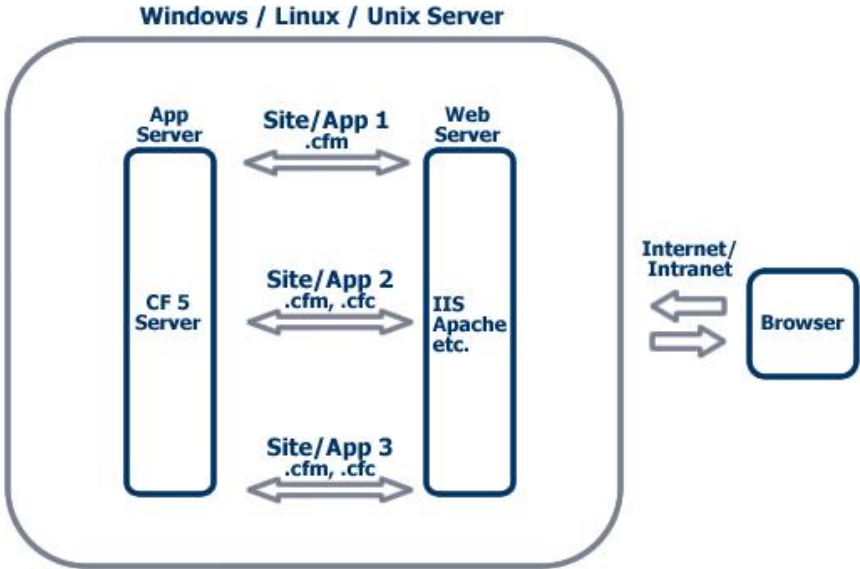
The J2EE configuration of Macromedia ColdFusion MX 7 Enterprise Edition enables you to run multiple ColdFusion server instances on a single physical server using either the bundled Macromedia JRun J2EE application server or a third-party J2EE server such as IBM WebSphere or BEA WebLogic. The result is an environment of highly available, secure, and performance optimized applications, which, in the past, would have required multiple copies of ColdFusion running on separate physical servers—but without the additional hardware and software expense.

The Difference Between Single Server and Multiple Server Instances

In earlier versions of ColdFusion, ColdFusion could only be installed once per server. All applications on that machine executed within a single server process (see Figure 1). This meant that all applications shared global settings (mail servers, caching settings, debugging settings, security sandboxes, and so on), and that a problem with one application could “bring down” all of the others (if, for example, the server became unresponsive and needed to be restarted).

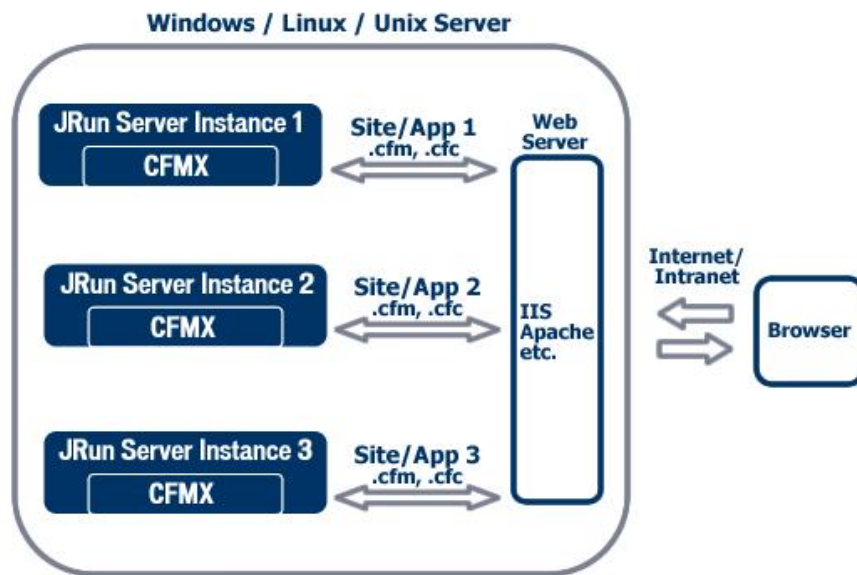
The only solution to this potential problem was to run each application on a separate machine, so each application could be fully customized and tuned and would not impact other servers in case of application failures. For a corporate intranet where one would want, for example, the human resources application isolated from the business reporting application, the expense of having multiple servers each with its own ColdFusion license may have been undesirable, and the additional administrative efforts required would have been significantly higher.

Figure 1: A single instance of the ColdFusion server handled all sites or applications in earlier versions.



Using ColdFusion MX 7 Enterprise Edition, a single physical server can be configured to act as though it were many. ColdFusion is installed on a J2EE server instance running within its own Java Virtual Machine (JVM). As its name implies, a virtual machine is a self-contained operating environment that behaves as if it were a separate computer while actually sharing resources with other virtual machines on the same server. As a result, a customer may install another J2EE server instance on another, completely separate JVM, and install ColdFusion there as well. These two ColdFusion servers now operate in complete isolation of each other—just as though they were on separate physical servers (see Figure 2).

Figure 2: ColdFusion MX 7 Enterprise Edition allows multiple instances of ColdFusion to serve individual applications in isolation on a single physical server.



The Benefits of Multiple Server Instances

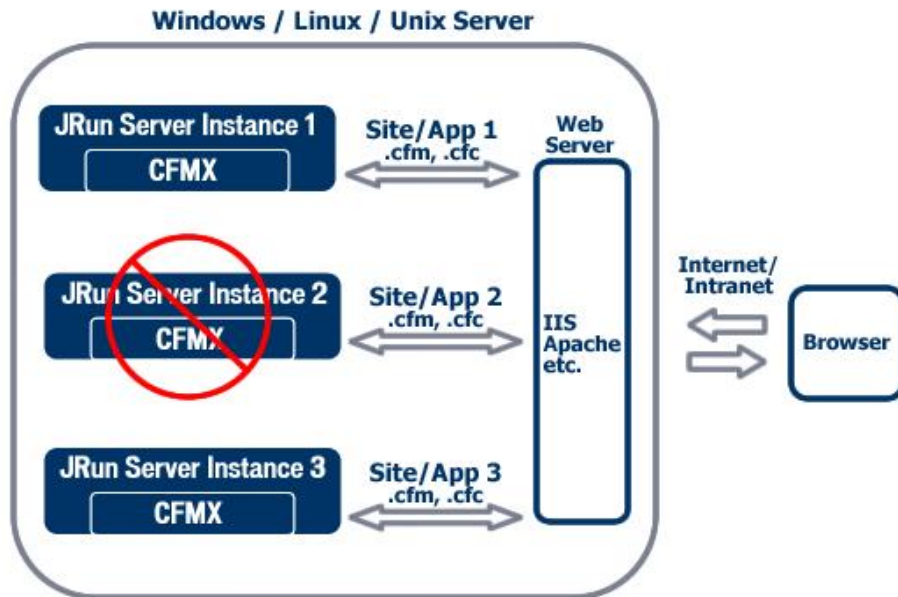
ColdFusion MX 7 Enterprise Edition deployed in multiple server instances is the most economical way to deliver highly available, secure, and performance optimized applications. It allows a single server to provide many of the benefits that, in past versions, required the added cost and maintenance challenges of running multiple physical servers.

High Availability

As referenced earlier, all applications running on a single ColdFusion server instance have the potential to impact one another. An improperly coded application, renegade CFX tag, JVM bug, or excessive load in one application or site could cause all of the other sites on the same machine to perform poorly, or worse -- fail. Or, if a server has to be restarted, all applications in a single-server instance configuration will be unavailable while the server restarts.

With ColdFusion MX 7 Enterprise Edition deployed in multiple server instances, these issues are mitigated. Each application is effectively treated as if it were running on its own server. Each instance and application can therefore be stopped, started, upgraded, and managed entirely independently of any other application (see Figure 3).

Figure 3: If, in instance 2 below, an improperly coded application causes ColdFusion to perform poorly or even fail, or if the server needs to be restarted for any reason, the applications running in instances 1 and 3 will not be impacted.



Enhanced Security

For those hosting applications for multiple departments or clients on the same server with previous versions of ColdFusion, granting developers access to the ColdFusion Administrator may have been a security risk if one developer inadvertently changed a setting that would impact someone else's application. With ColdFusion MX 7 Enterprise Edition deployed with multiple server instances, each site or application can have its own instance, and therefore its own ColdFusion Administrator. The owner of each ColdFusion instance can safely make changes within the Administrator that will not affect other instances. This allows resources such as custom tags, ColdFusion components, Java classes, and data sources to be safely isolated on a per-application basis.

Applications isolated within their own instance also guarantee the security of shared scopes such as server, application, and session scopes. Developers can use these shared scopes without concern that another application on the same server may overwrite an important value.

Finally, within each instance, ColdFusion developers can take advantage of the powerful sandbox security features of ColdFusion MX 7. This gives developers precise control over resource use in applications with directory-based access control for tags, functions, data sources, and IP addresses.

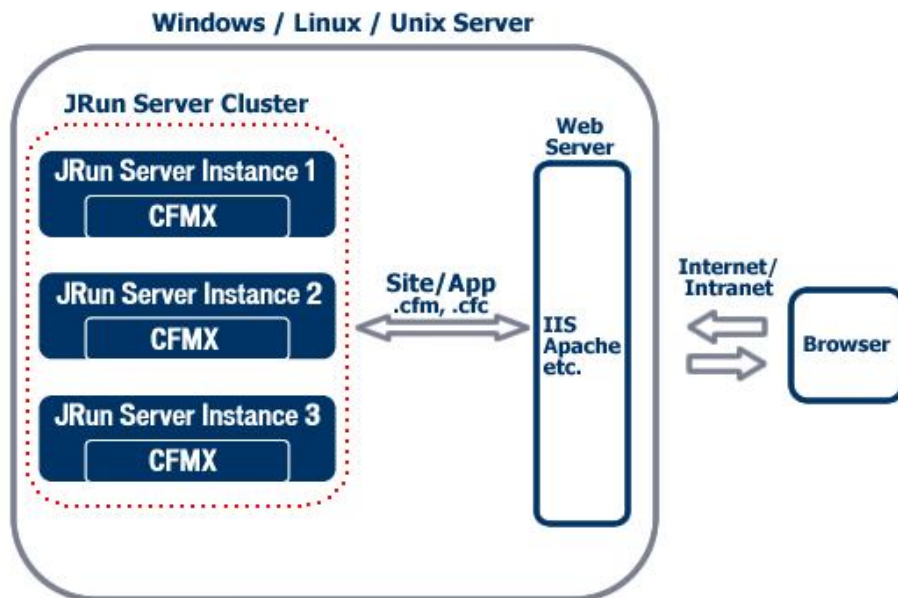
Optimized Applications

Different applications have different needs. Some may have heavy database transaction loads, others may integrate Java objects, and still others may make extensive use of Verity collections. Since each server instance of ColdFusion MX 7 has its own ColdFusion Administrator and its own ColdFusion settings, applications can be fine-tuned to be optimized for their unique needs. Settings such as simultaneous requests, mappings, data sources, verity collections, debugging, JVM heap size, and classpaths can be set as needed for each individual server instance.

Clustering

In earlier versions of ColdFusion, you could increase a site's ability to maintain availability, reliability, and performance by creating a cluster of multiple physical servers to eliminate any single machine as a single point of failure. This was possible using either hardware- or software-based load-balancing solutions. With most J2EE servers, (including Macromedia JRun included with ColdFusion MX 7 Enterprise Edition), you can cluster instances on the same physical server (see Figure 4). In other words, you can have multiple copies of the same ColdFusion application, each running in a separate ColdFusion instance on the same machine, and cluster them so that you have the benefits of application failover without the cost of purchasing and maintaining multiple machines. Further, you can now use the new browser-based Instance Manager in the ColdFusion Administrator to create these instances and cluster them together in three simple steps.

Figure 4: A cluster of ColdFusion instances on one single physical server provides the failover benefits of server clusters without the cost of more hardware.



ColdFusion also enables developers to cluster the session variable scope. In ColdFusion 5 and earlier it was quite difficult to use sessions and clustering at the same time. ColdFusion MX 7 Enterprise Edition in the J2EE configuration leverages Java sessions, which can be clustered (on some J2EE servers). As such, ColdFusion session variables can be shared across ColdFusion instances on the same physical server. Of course, depending on your site demands, you can continue to use clusters of multiple physical servers, and still take advantage of Java sessions.

Conclusion

ColdFusion MX 7 Enterprise Edition adds the ability to configure ColdFusion in multi-instance environment enabling a single server to provide many of the benefits that, in past versions, required the cost and maintenance challenges of running multiple physical servers. It delivers high availability, enhanced security, fine-grained application optimization, individualized application administration and clustering by using either the bundled Macromedia JRun J2EE server or another third-party J2EE server such as IBM WebSphere, or BEA WebLogic. These features combined with the highly productive ColdFusion scripting language and extensive suite of built-in application services make ColdFusion MX 7 Enterprise Edition the best solution for rapidly building and deploying powerful web applications and web services.