

## Inside Citrix chapter five – The one with the FMA and its foundation

The FlexCast Management Architecture is a Microsoft .NET-based architecture built upon the WCF (Windows Communication Foundation) framework. It is a framework used specifically for building service-orientated applications like XenDesktop / FMA, consisting of a deployment model based on Controllers running multiple highly available (stateless) services. WCF is also referred to as a Microsoft software development platform. As per Microsoft:

WCF is a runtime and a set of APIs (Application Program Interfaces) for creating systems that send messages between services and clients. The same infrastructure and APIs are used to create applications that communicate with other applications on the same computer system or on a system that resides in another company and is accessed over the Internet.

### Microsoft's .NET

One of the main reasons why we refer to the FMA as being a .NET-based architecture is because it is built and based on WCF. In fact, the WCF framework itself is built using the Microsoft .NET framework: confusing, right? Let me break it down a little further.

The Microsoft .NET framework is a software framework developed by Microsoft during the late-1990s. The first Beta of .NET was released in late-2000. In simple terms it provides language interoperability across multiple programming languages within a single platform. It does this by including a large Class Library, known as the Framework Class Library (FCL), which holds a collection of reusable classes, interfaces and value types used for writing / programming applications.

Applications which are written for, or use, the Microsoft .NET framework are executed in a software environment known as the Common Language Runtime, or CLR in short. The CLR is the virtual machine component of the .NET Framework and it manages the execution of applications written using the .NET Framework (regardless of the programming language used). Also known as .NET programs.

When an application is executed a process called just-in-time compilation kicks in and converts the compiled code (used for programming / coding the application) into machine instructions, which will then be executed by the CPU residing in the virtual machine (CLR) mentioned earlier. Next to all this the CLR provides additional services in the form of garbage collection, memory management, type safety and a few more.

In short, the .NET Framework can be used to develop/code .NET-based applications using (at least) the following languages: Visual Basic, Visual C#, Visual F# and Visual C++. These can be either GUI (Graphical User Interface) or command-line-based applications as well as ASP.NET, web forms and XML Web services. And last but not least, we have Microsoft Visual Studio, which is the Graphical User Interface from where all coding and programming can be done.

## Virtual Studio + .NET + WCF equals?

But wait, there's more. Visual Studio uses a Microsoft software development platform as its base. In the case of the FMA, we've already established that it is built upon WCF, which is also one of Microsoft's software development platforms.

Let's take one step back and résumé, shall we? First we have the .NET Framework, which can be used to develop or program .NET-based applications. WCF is built using, and based on, the .NET Framework, while Visual Studio uses WCF as its base development platform from where the FMA or XenDesktop is created. Let's visualize.



### Foundation overview

I am aware that this all may sound a bit abstract but hopefully it does give you a basic understanding of how it all fits together and how XenDesktop, or the FMA, was born just a couple of years ago.

## Key takeaways

- The FlexCast Management Architecture is a Microsoft dot-net-based architecture built upon the WCF (Windows Communication Foundation) framework.
- The WCF framework itself is built using the Microsoft .NET framework.
- Dot-net-based applications are executed in a software environment known as the Common Language Runtime, or CLR.
- The .NET Framework supports the following programming languages: Visual Basic, Visual C#, Visual F# and Visual C++.
- Citrix offers several SDKs and APIs, plus some additional tools and services to help you build and integrate custom-developed monitoring and management solutions.
- Citrix has its own Citrix Developer Visual Studio Extension free for you to download.
- Google for ‘Citrix developer overview’ and you are good to go.