

DESIGN OF DISTRIBUTED SYSTEM APPLICATION ON SOA, WPF, WF AND WCF LIKE NEW TECHNOLOGIES: A SURVEY

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Abstract:

In this paper, a Survey of Latest Technologies used in the Software companies based on the latest Service Oriented Architecture (SOA) ,Windows Presentation Foundation (WPF), Windows communication foundation (WCF), Windows Workflow Foundation(WF) technologies, which can satisfy the demand on any request , WPF provide Graphical Window view ,SOA provide Architecture , WF provide Object orient Workflow and WCF provide the communication layer which work like Middleware like RPC,RMI CORBA. The server side services are designed as based on template architecture which could change database in configuration file. To satisfy the demand on performance, the requests are transmitted by message service. The client can realize demand request communication with the service application by using the TCP protocol. The implementation of the new technology system also validates better expansibility, and works efficiency and compatibility than traditional system based on previous technology in the enterprise.

Keywords- SOA, WPF, WF, WCF; Middleware Distributed;

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AJ. INTRODUCTION:

Now day IT company grown in very rapidly by extending present technologies, upgrading present technologies and adding new technology. So change is main factor in growth of any company but it must factor in IT companies as compare to other company. But at the time of change the technologies totally remove or wastage some which is presently used technologies are not economically acceptable. So instead of change that technology which is used in old technologies these are used in new technology with extendibility that technology system implements based on WCF, WPF and SOA. We know any software development need the acceptable software Architecture, User friendly User Interface View and Service which required by user.

Above three requirements are fulfill by first SOA, second by WPF and third by WCF. Now we see in details the; what is SOA, WPF and WCF?

I. Service Oriented Architecture (SOA)

While the Internet's human-facing side is undergoing the Web 2.0 revolution, the machine facing side is likewise experiencing a major transformation from an application based to a service-oriented architecture both within and across enterprise boundaries. Why is the enterprise software industry all abuzz about SOA? Enterprises have traditionally purchased new applications from a software vendor, perhaps customizing them to meet specific requirements, or developed them from scratch.

Both approaches are costly in their own way and often lead to applications that are difficult to change as the organization's needs evolve. The SOA approach does away with such monolithic applications. Instead, as Figure 1a shows, an application is structured as a set of services orchestrated by business processes. A new application is built by recomposing the enterprise's services, including those drawn from several existing applications. If a new composite application requires some new services, the developer will develop and incorporate them, but it will reuse existing services as much as possible to meet the new application's service needs. Developers can wrap legacy APIs with service interfaces and reuse them as well. They can develop new nuggets of functionality incrementally and then make them available as new services. Some of the needed services can even reside elsewhere on the Internet, hosted by

software as service (SaaS) vendors. Later, as the business evolves, developers can modify corresponding processes while reusing the underlying services. The SOA approach lets enterprises repurpose software assets, thereby achieving a better return on their IT investments. It also enables a more fluid evolution of applications, making quick responses to new business needs possible. Emerging SOA tools support these objectives by making it easy to create new applications and services by composing and recomposing existing services, particularly at the business-process level.

1) From Services to Data Services

Those of us who grew up in the “preaSOAic” era will quickly notice that something is missing from Figure

1a: a data model associated with the application. To use a simple analogy, services provide operations that are akin to verbs the business actions available to application developers. Missing are the nouns the data entities. By focusing only on business processes and services, the basic SOA model misses what the actions are about. In addition, business processes often need access to information. How should data fit into the SOA puzzle? How can “data thinking” reduce the degree of knowledge and amount of work required to develop compositional SOA applications like the business process depicted in Figure 1a (1) ?

Enter data services. Applications have always been “about” data in some sense, and once upon a time an application’s data model was central to the design process. The SOA world has recently begun to realize that SOA applications are ultimately still just applications. Data services are thus an important class of services that warrant explicit consideration in designing, building, and maintaining SOA applications.

2) SOA standards

Those familiar with SOA know that there’s no shortage of Web services standards. Beyond foundational standards such as XML, XML Schema, SOAP, and WSDL, groups like the World Wide Web

Consortium (W3C) and the Organization for the Advancement of Structured Information Standards

(OASIS) are actively developing standards in the WS-* and related standards families that address topics including security, reliable messaging, service orchestration, and transactions. In addition, an informal group of industry leaders known as the Open SOA Collaboration (www.osoa.org) is working on another SOA-related standard, Service Component Architecture (SCA), that deals with the Wiring and configuration aspects of service composition and provides a service description framework that extends well beyond Web services.

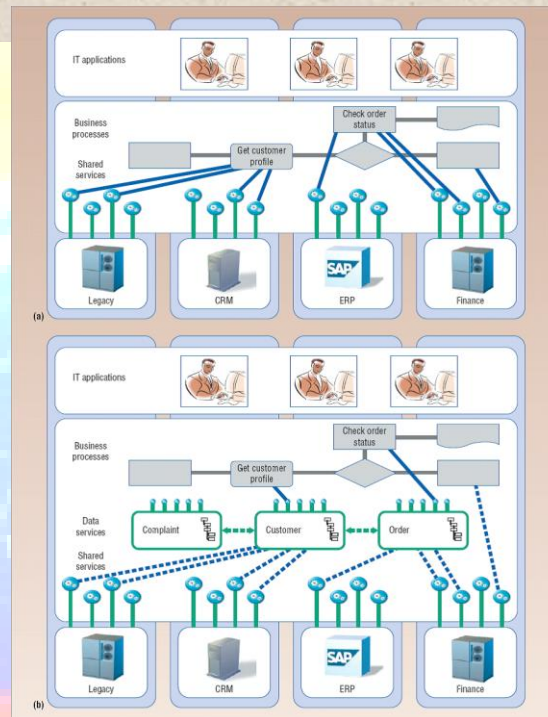


Fig. 1. Service oriented architecture. (a) Applications are supported by business processes that are themselves compositions of reusable business services. (b) Data services enable business processes to access and manipulate a SOA application's business objects.

II. Windows Presentation Foundation (WPF):

Windows Presentation Foundation (WPF) is the graphical subsystem for all things related to the UI

Windows Presentation Foundation, also known as WPF, is the next-generation graphics platform on which both Windows and web-based applications can be built to run on Windows Vista, the latest evolutionary release of the Windows operating system. WPF provides the foundation for

introducing an elegant and high fidelity User Experience (UX) by juxtaposition of user interface, application logic, documents, and media content.

WPF provides a number of different application models you can choose from to meet your needs.

Traditional standalone windows applications are supported but now provide two distinct navigation models: menu-based and navigation-based. Browser based applications are also supported. Standalone XAML files can be published to a web server or launched directly from the file system. Additionally, a new type of browser-based application is offered called the XAML Browser Application (XBAP), which is a compiled application that can be deployed in a browser environment similar to a .NET Smart-Client application. Regardless of the application model you choose, the WPF development platform does not change. You use the same CLR code base and XAML to create you application. Only your deployment model will differ depending on your target environment. In WPF, as with any other platform, state management is important. The WPF Application object provides a global-scope collection that you can use to store state data during the life of your application. For a scenario in which longer term persistence is desired, a new construct called isolated storage is available. Isolated storage allows browser-based applications to write and read files to and from the local disk. No direct file system access is provided. Rather, WPF manages this access for you so that security is kept intact. WPF applications are typically made up of a collection of pages. Users navigate between these pages to retrieve content and access functionality provided by the application. Navigation has traditionally been menu-driven in standalone Windows applications and link-driven in web applications. These methods are considered unstructured navigation models because pages are unaware of actions performed in other pages. This has, in part, been a result of the stateless environment of the web. WPF offers a new navigation model you can use to build your application. Navigation in WPF is called structured navigation. Structured navigation provides a mechanism in which pages can interact intelligently. A calling page can call a target page, be notified when the target page completes an action and, optionally, get a value in return. World-ready applications require localization in order to support the cultural constructs of your target locales. Support for multilingual text and cultural differences within elements, such as calendar dates and currencies, are provided in WPF. Planning your UI to support this can be challenging, but WPF provides content controls and best practices that will enable you to localize your

applications in a snap. In this way many features supported by each of these deployment models and which are best to use in relation to your application model. As mentioned above, the development code base does not change based on application model. Only your deployment method will change. Based on the target hosting environment, security considerations, and application management requirements, you will be able to pick the best deployment model for your scenario.

III. Windows Communication Foundation (WCF):

WCF is a programming platform and runtime system for building, configuring and deploying network-distributed services. It is the latest service oriented technology; Interoperability is the fundamental characteristics of WCF. It is unified programming model provided in .Net Framework 3.0. WCF is a combined feature of Web Service, Remoting, MSMQ and COM+. WCF provides a common platform for all .NET communication.

WCF, alongside Windows Workflow Foundation (WF) and WPF, is intended to become the primary framework for building the next wave of business applications for the Microsoft Windows operating system. WCF enables you to build powerful service-oriented systems, based on connected services and applications. You can use WCF to create new services, as well as augment and interoperate with the functionality available through many existing services created by using other technologies. When designing distributed applications in the past, you frequently had to choose a specific technology, such as Web services, COM+, Microsoft Message Queue, or .NET Framework Remoting.

The Purpose of Windows Communication Foundation (3):

By using Visual Studio, the .NET Framework, and WSE, you can quickly build Web services and client applications that can communicate and interoperate with Web services and client applications running on other operating systems. So why do we need WCF? Well, we already know, Web services are just one technology that you can use to create distributed applications for Windows. Others already include Enterprise Services and .NET Framework Remoting. Another example is Microsoft Message Queue (MSMQ). If you are building a distributed application for Windows, which technology should you use, and how difficult would it be to switch later if you need to? The purpose of WCF is to provide a unified programming model for

many of these technologies, enabling you to build applications that are as independent as possible from the underlying mechanism being used to connect services and applications together. It is actually very difficult, if not impossible, to completely divorce the programmatic structure of an application or service from its communications infrastructure, but WCF lets we come very close to achieving this aim much of the time. Additionally, using WCF enables us to maintain backwards compatibility with many of the preceding technologies. For example, a WCF client application can easily communicate with a Web service that you created by using WSE.

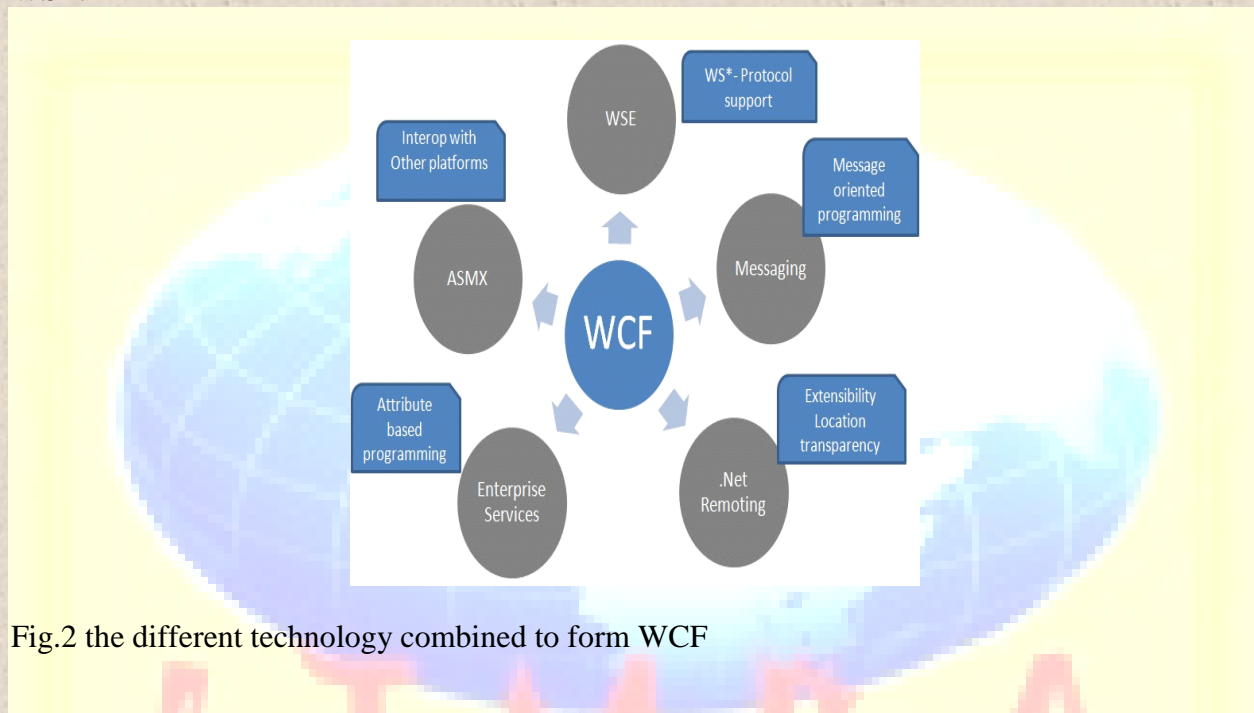


Fig.2 the different technology combined to form WCF

VI. Windows Workflow Foundation (WF):

workflow as the basic tasks, procedures, people and organizations, system informational input and output, policies and rules, and tools needed for each step in a business process.

When you execute tasks in the Workflow Foundation (WF) environment, something needs to oversee that execution and keep things straight. In WF, that something is an object known as WorkflowRuntime. WorkflowRuntime starts individual workflow tasks. WorkflowRuntime fires events for different situations that pop up while your tasks execute. And WorkflowRuntime keeps track of and uses pluggable services you can hook in to the execution environment. The overall WF architecture is shown in Figure 3. (6)

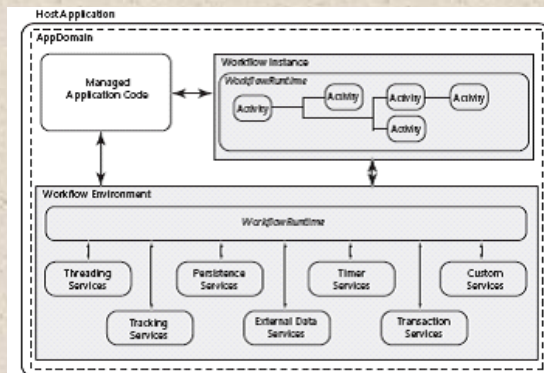


Fig.3. WF architecture

WF and your application execute concurrently. In fact, WF requires your application as a host. The host application might be a Windows Forms application, a console application, an ASP.NET Web application, or even a Windows service. The WF runtime and your application execute together in a .NET AppDomain, and there can be only one instance of WorkflowRuntime per AppDomain. Attempting to create a second instance of WorkflowRuntime in a single AppDomain results in an InvalidOperationException. You can build workflow applications “workflows” by creating logical groupings of activities. These logical groupings work to complete the workflow task you require. When you host the workflow runtime, you essentially hand the workflow your activities and tell it to execute them. This results in a workflow instance. The workflow instance is a currently executing workflow task, which is itself composed of logically grouped activities. And, as you recall from the first chapter, activities can execute code you provide as well as make decisions based on input data.

B) SOA, WPF, WF and WCF in Distributed Application:

WinFX (Windows Framework) is the new programming interface introduced in Windows “Vista”. It is the new set of managed code API that Microsoft releases with Vista. It is a unified, managed-code programming model that extends the .NET Framework 2.0 and enables you to build secure, next-generation, Windows-based applications. WinFX consists of three fundamental frameworks. They are

- Windows Presentation Foundation (**WPF**)

- Windows Communication Foundation (WCF) and
- Windows Workflow Foundation (WWF)

WPF is a new user interface subsystem and API based on XML, .NET and vector graphics.

WCF is service-oriented messaging system, which allows programs to interoperate locally or remotely similar to web services. It is the Messaging framework of WinFX.

WWF allows task automation and integrated transactions using workflows.

WinFX is intended to give programmers easier access to the functionality present in the Windows API.

Now we take another example of the **Direct to Home Television System (DTH)**; now days, many enterprises change their applications to distributed system in order to efficiently use the network resources and lower the cost of applications. Well Known Satellite Television, also known as DTH is the practice of making easily available of the any television program in any geologic location. Judging from the data stream, comprehensive DTH system contains only three types of data: text and images, Audio, Video (it can be Synchronized as Television Program). Based on loosely coupled, deployment and expansion of the consideration of the host server is divided into three procedures: audio, video and picture service. The audio service provides a sound description TV program. The picture service provides image data. The Video service provides the combination (Synchronised) of all required thing to video program. The AudioDataManager is responsible to remote business logic component extract data from the database. The picturedataProvider provide image data for program. The Videodatamanager provide the required data to that video. The DTH client chose the program or service like video on demand etc that request goes toward server throw the satellite ,then the client start seen the program with pay the money to service provide .

The step for the carries the all thing which required to DTH application system which is develop the system on the SOA in this the service getting communication is following way: first, DTH client chose the service like video on demand service which is available on set of box (client side) client program; second, the Set of Box Create message and send to Server throw Satellite. Third, after receiving that request message that is map to the required format to that server technology (.Net) communication layer middleware. Then processing on that client request by

service provider. After that sever application create the Replay message to that client request. Throw communication layer and Satellite to client. So, in this way now client can ready to enjoy the see the program. In DTH Application implement the service WCF is responsible to implement application with require way. In this way the system implement with new technologies like WPF, SOA and WCF.

C] Conclusion:

This paper briefly introduces the SOA, WPF, WF and WCF technologies, and describes how they are capable the developed the new application like the distributed DTH system and WinFX System with the help of above technologies. WCF is Microsoft's unified framework for building and running service-oriented applications using managed code. It enables developers to build secure, reliable, transacted solutions that integrate across platforms and interoperate with existing investments. In this way we can say that the Distributed application system based on SOA, WPF and WCF works well in using of the existing enterprise network and computer resources and available technologies, reducing the user's computer hardware requirements, scalability and compatibility. In addition, the client and host service program is a loosely coupled relationship. When demands change, the application system only needs to change the separated service program or client. In this way, we can avoid the problems which are caused by technology changes of the deployment and system structural adjustment.

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