IBM Network Computing Framework and the Open Blueprint Structure

Summary

The Open Blueprint is IBM's industry-leading software structure for distributed computing. It extends today's client/server base with the technologies that enable network computing. Based on industry standards for interfaces, protocols, and technologies, the Open Blueprint enables heterogeneous platforms to work together to form the base upon which to build integrated solutions.

Integrated business solutions are built using a variety of tools and techniques.¸ As a solution is designed, various styles or views of computing are considered for the solution's delivery. The Open Blueprint structure provides the underlying architectural reference model that organizes and identifies the candidate solution components and enables their integration into the solution delivery platforms.

The IBM Network Computing Framework (NCF) is one such style or view of computing. It selects from the Open Blueprint reference model the components needed to build a network computing solution, associates these components with specific technologies, and identifies products that provide the component function.¸ NCF is prescriptive in that it makes specific technology and product choices.

Building on the rich base of industry-standard functions and interfaces described in the Open Blueprint structure, the IBM Network Computing Framework enables the rapid deployment of network computing solutions.

IBM Network Computing Framework and the Open Blueprint Structure

Open Blueprint Overview

The Open Blueprint structure is a functional model of the distributed, networked environment. It serves as a reference framework that defines the services required by applications in a heterogeneous, network environment.

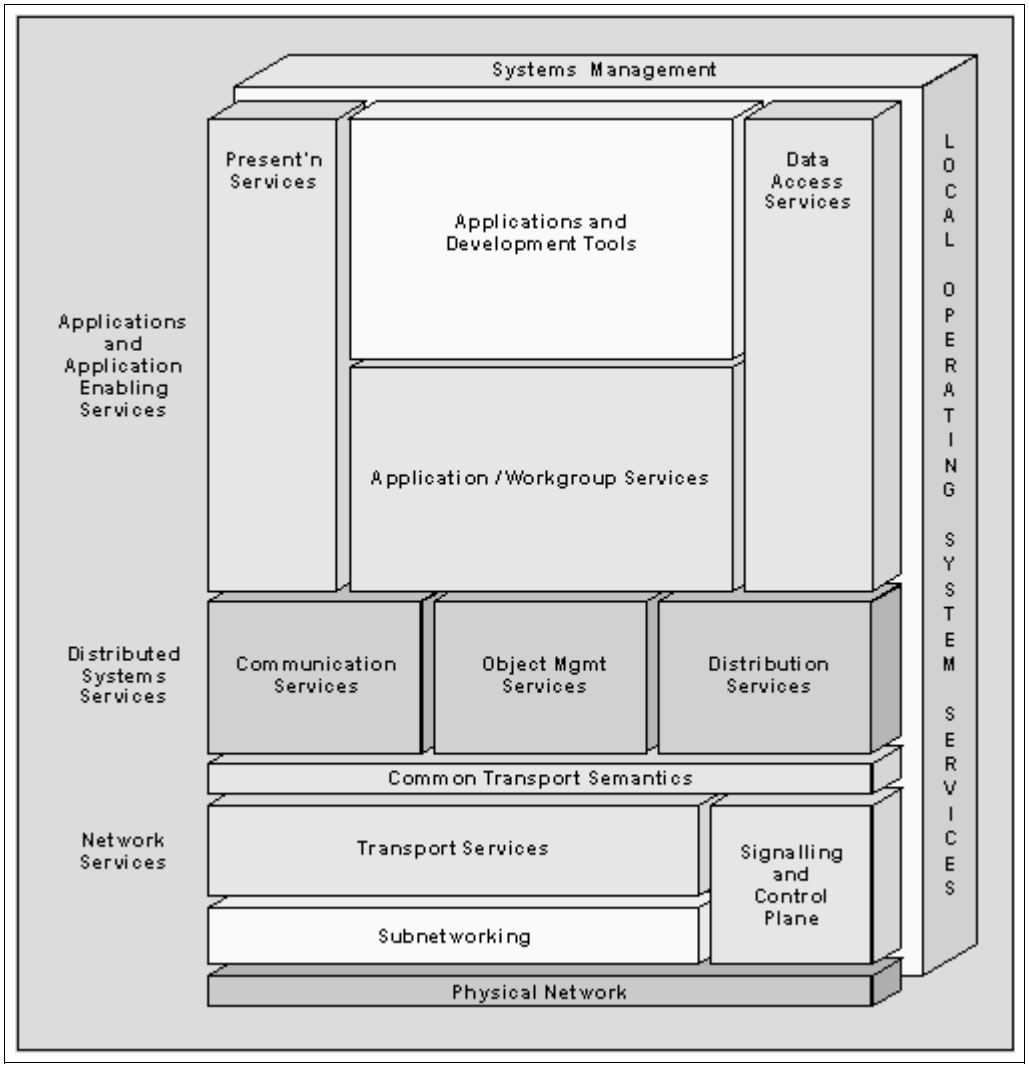

Figure 1:¸ The Open Blueprint Structure

The Open Blueprint structure enables interconnected systems to cooperate in support of business solutions. Services on each system manage resources cooperatively across the network. Each node in the network is structured using the Open Blueprint reference model. The equivalent services on each platform work together to provide seamless, network-wide support for distributed, client/server, or networked applications. The Open Blueprint provides software

principles and guidelines, defines the desired functions, and specifies important boundaries, interfaces, protocols, and technical attributes.

Introduction to Computing Styles

The blocks in the Open Blueprint diagram (Figure 1) contain multiple components. These components can be combined in different ways to address varying requirements or constraints. At its most generic, the Open Blueprint is a reference model that defines the lowest, most granular level of ingredients which will comprise the solution platforms and defines the basic rules and relationships among these ingredients.

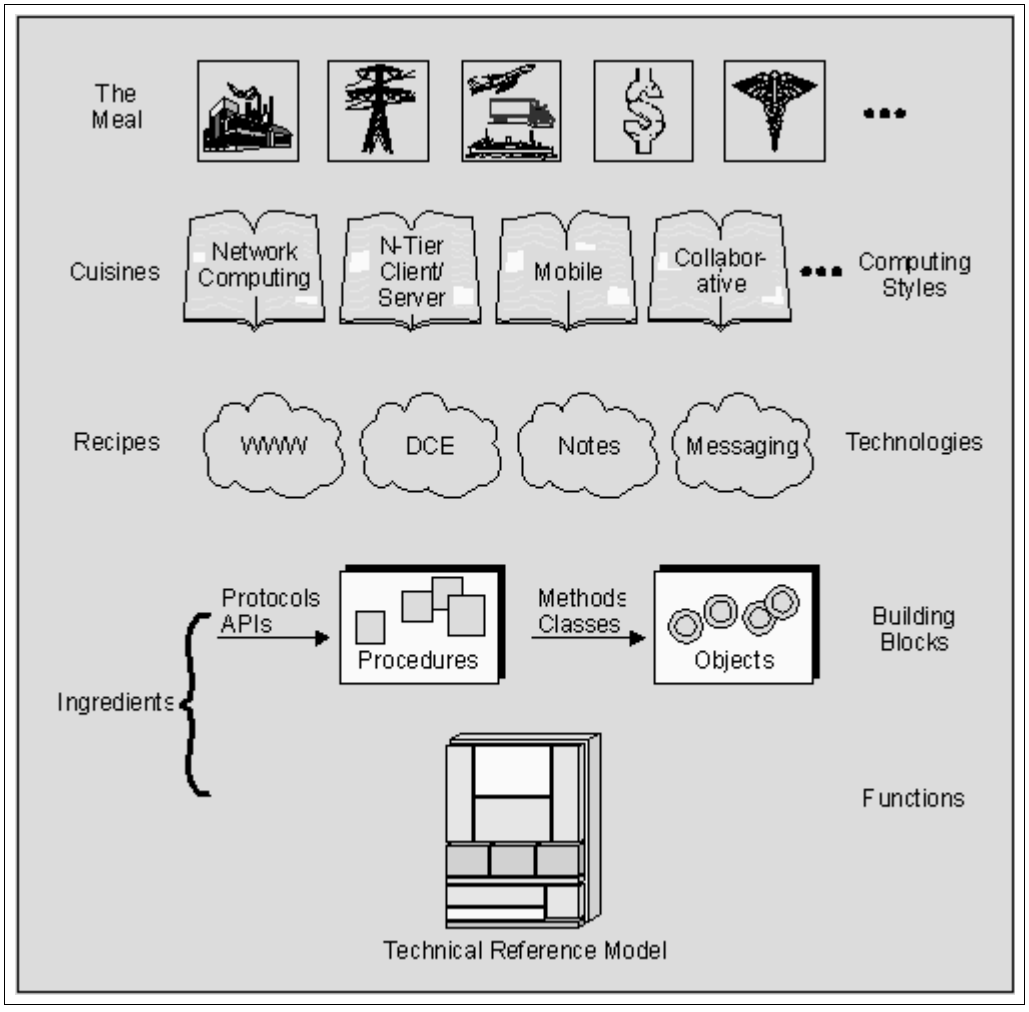

Figure 2:¸ Open Blueprint Building Blocks

These ingredients can provide either procedural or object-oriented interfaces and can coexist and work with each other. They are basic building blocks that can be combined in different ways to form recipes.

These recipes represent various subsets of the Open Blueprint structure that can help organizations plan for and choose technologies and products. Examples of these recipes include basic Worldwide Web support through a Web Browser and HTTP Server or Collaboration support through Lotus Domino function.

Just as a group of related recipes form a particular cuisine, the infrastructure building blocks can be combined into various computing styles or views, for example n-tier client/server or network computing.¸ These computing style cuisines are implemented by products that form the base upon which to build various business solutions.

The IBM Network Computing Framework is an implementation of one of these cuisines.

IBM Network Computing Framework Overview

The IBM Network Computing Framework (NCF) is designed to help developers create new kinds of e-business applications. But before launching into the framework itself, it's important to cover the range of solutions that can be built with it. Businesses' first forays into network computing are typically in three primary areas:

1. Content-Management Solutions: Better ways to leverage information (often the most valuable company asset)

2. Collaboration Solutions (often called groupware): Better ways to get teams to work together

3. Commerce Solutions: Better ways of working with customers, suppliers, and partners

Development teams often draw on a combination of these three areas to create applications for users.

This new model of network computing provides a much faster way to develop applications (new systems can be up and running in months, rather than the years it can take with more traditional approaches). What's challenging is that these types of solutions are often expanded (because they *can* be expanded) to meet additional needs as time goes on.¸ This calls for a new development model — one that's both more flexible to adapt to changes in these systems) and more efficient (so all coding efforts are reusable and adaptable).

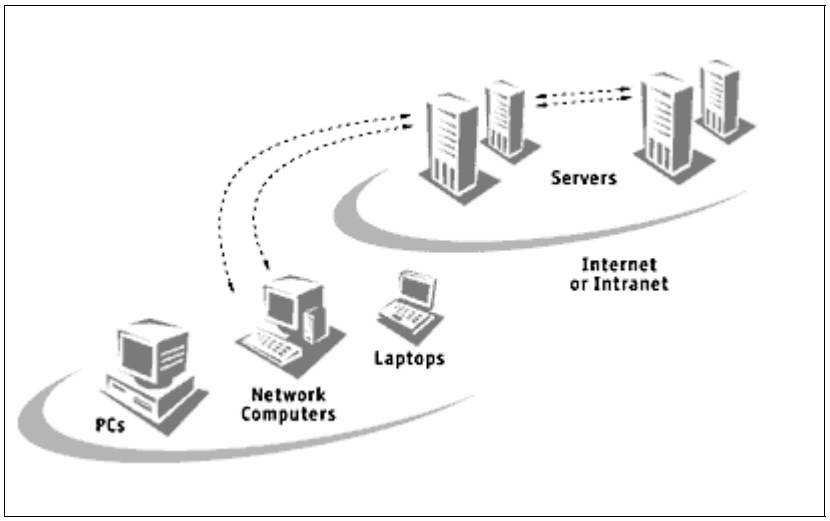

Figure 3:¸ IBM Network Computing Framework (NCF) Model

The NCF contains six key elements:

1. An infrastructure and a set of servers whose capabilities can be accessed using standard protocols such as POP3, LDAP, and so on and a standard component interface, JavaBeans.

2. A set of clients that exploit components that can be delivered just in time to provide a rich user interaction with the server.

3. Tools that can create and exploit JavaBean components to build robust network computing applications. As a result, any tool can produce a component to access any service.

4. Support for open protocols, such as HTTP and IIOP, that link JavaBean components.

5. A built-in set of groupware solutions that provide mail, discussions, chat rooms, and group scheduling, and a foundation for an industry of partner-built solutions and customizable applications for e-business.

6. A set of connector services that provide access to existing applications, data, and transactions.

Open Blueprint Structure Support for NCF

Network computing is a form of distributed computing that is based on open, industry standards where applications and data reside in an interconnected network.¸ Open Blueprint components, called resource managers, are distributed throughout the network to provide the network computing infrastructure.¸ The NCF has selected the appropriate resource managers for inclusion as its technical components.¸The remainder of this section maps the IBM NCF technical components to their corresponding resource managers in the Open Blueprint.

IBM Network Computing Framework and the Open Blueprint Structure

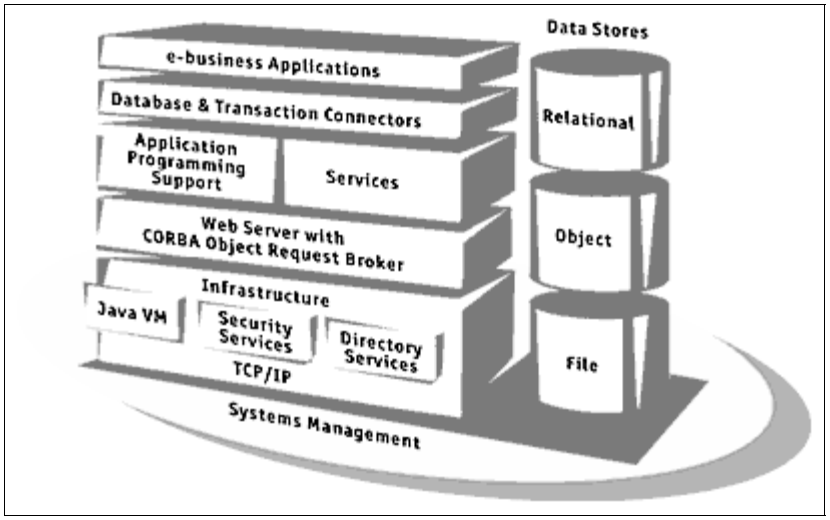

Figure 4:¸ IBM Network Computing Framework (NCF) Structure

Within the Open Blueprint structure, resource manager servers can be physically distributed across private and public network boundaries. This distribution enables access to services and information from outside the enterprise and permits an enterprise to provide services and information to business partners and customers. TCP/IP Network Services support Internet, intranet, and extranet capabilities in a secure fashion using Secure Sockets Layer (SSL) support.

The base network computing infrastructure is supplied by the Virtual Machine resource manager that supports Java, Security resource managers that support public key technology, and the Directory resource manager that supports LDAP.

The prototypical NCF application is a web browser request for an HTML page where that HTML page is created dynamically. The Web Browser resource manager provides client access; the HTTP resource manager (the NCF Web Server) provides client to middle tier communication.¸ At the web server, either the Domino Collaboration resource manager or the application logic developed as JavaBeans or both is executed to provide the required content. The NCF application may also require connection to data and transaction services provided by the Transaction Monitor and Database resource managers that access mission critical applications and data on mid-tier and enterprise servers.¸ The Object Request Broker is used to support access to objects between client applets and server objects and among servers using CORBA 2.0 and IIOP.

Open Blueprint resource managers such as Mail and Collaboration provide access to a rich set of application services across the network in support of NCF.¸ The File resource manager provides support for the Distributed File System (DFS).¸ Many other Open Blueprint resource managers support access to and from their resources throughout the network.

Conclusion

The IBM Network Computing Framework is derived from the Open Blueprint structure and is consistent with it. The NCF selects particular components from the Open Blueprint reference model to support network computing and identifies the technologies and products upon which to build networked solutions.

As the industry moves forward, IBM will continue to enhance both the Open Blueprint reference model and the IBM Network Computing Framework to address new business challenges, to exploit new technologies, and to embrace new standards. This is an overwhelmingly exciting time in our industry. The IT industry has not seen a revolution like this in more than 30 years. As more and more of the world's businesses come to the Net, IBM will be there to work with our customers to build innovative solutions which exploit network computing to satisfy business needs.

For More Information

For additional information on the Open Blueprint, visit web site:
http://www.software.ibm.com/openblue

For additional information on the IBM Network Computing Framework, visit web site:
http://www.software.ibm.com/ebusiness