



K2 blackpearl technology requirements

UNDERSTANDING THE REQUIRED AND SUPPORTING TECHNOLOGIES

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The main and supporting technologies of the K2 platform. Built upon Windows 2003 Server, NET 3.0 and SQL Server 2005, and integrated with Visual Studio 2005 and the 2007 Microsoft Office System.



INTRODUCTION

K2 provides the platform that enables developers and business users to assemble dynamic business applications from reusable items.

To meet the needs of multiple industries and situations, K2 is built on the Microsoft platform and gives customers and partners the ability to work together and build applications in a familiar environment.

This paper describes the required server and client applications of the K2 blackpearl software and optional or supporting technologies with which K2 blackpearl integrates.



Note: For the most up-to-date information regarding the technologies and software supported by K2, please see the Compatibility Matrix available at http://help.k2.com/en/blackpearlmatrix.aspx.

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THE K2 BLACKPEARL FUNCTIONAL ROLES

There are three main K2 blackpearl functional roles that are used in this article to outline the environmental requirements.



Note: For the most up-to-date information regarding the technologies and software supported by K2, please see the Compatibility Matrix available at <http://help.k2.com/en/blackpearlmatrix.aspx>.

OPERATORS

Operators install, run and monitor the health and performance of K2 blackpearl servers.

REQUIRED FOR OPERATORS

- > Microsoft Windows Server 2003 SP2
- > Microsoft SQL Server 2005 SP2 and Reporting Services
- > .NET 3.0
- > IIS / ASP.NET
- > Kerberos
- > Microsoft Data Transaction Coordinator
- > Messaging
- > Internet Explorer 6.0 or 7.0

RECOMMENDED FOR OPERATORS

- > K2.net 2003 SP4

OPTIONAL FOR OPERATORS

- > Microsoft Office SharePoint Server 2007 and Windows SharePoint Services v3
- > InfoPath Forms Services

DESIGNERS

Designers design, build and deploy dynamic business applications to K2 blackpearl servers.

REQUIRED FOR DESIGNERS

- > Microsoft Windows XP SP2 or Microsoft Windows Vista
- > .NET 3.0
- > Internet Explorer 6.0 or 7.0

RECOMMENDED FOR DESIGNERS

- > Microsoft Visual Studio 2005 SP1
- > K2.net 2003 SP4

OPTIONAL FOR DESIGNERS

- > Microsoft Office Visio 2007
- > Microsoft Office Word, Excel and PowerPoint 2007
- > Microsoft Office InfoPath 2007

USERS

Users leverage dynamic business applications on K2 blackpearl servers

REQUIRED FOR USERS

- > Microsoft Windows XP SP2 or Microsoft Windows Vista
- > Internet Explorer 6.0 or 7.0

OPTIONAL FOR USERS

- > Microsoft Office Word, Excel and PowerPoint 2007
- > Microsoft Office InfoPath 2007

For a visual overview of K2 blackpearl technology requirements, see the [requirement diagrams](#).

MICROSOFT WINDOWS SERVER 2003 SP2

REQUIRED FOR OPERATORS

The K2 blackpearl Server and other server components require Windows Server 2003 with Service Pack 2 or greater. K2 blackpearl will also support Windows Server 2008 shortly after its release.

IIS / ASP.NET

REQUIRED FOR OPERATORS

The K2 blackpearl Web services and Workspace Web site run from a standard, dedicated Internet Information Services (IIS) Web site. Furthermore, the extension of SharePoint is accomplished through the SharePoint Central Administration site, including integration with the Business Data Catalog (BDC) and the activation of the K2 Web Designer for SharePoint.

KERBEROS

REQUIRED FOR OPERATORS

The K2 blackpearl Server environment requires Kerberos authentication and authorization for a distributed network topology where multiple pieces of the K2 blackpearl Server system are installed on different servers. Kerberos is also required if system headers route network traffic to different sites on one or more servers. For more information about configuring Kerberos, see the whitepaper *Security and Authentication with K2 Servers: Security Rights and Step-by-Step Instructions for Configuring Kerberos for K2 blackpearl*.

MICROSOFT DATA TRANSACTION COORDINATOR

REQUIRED FOR OPERATORS

K2 blackpearl is a modular application that can be distributed into independent components. Transactions allow modular execution of component operations to provide failover and fault handling between K2 components. The failure of one component does not corrupt the operation of other components.

To support distributed transaction management between the K2 Host Server and the SQL databases, for instance, Microsoft Data Transaction Coordinator (MSDTC) must be enabled. When working in an environment where the K2 Host Server is located on a different server than the K2 databases, Network DTC must also be enabled on both servers.

For more information on activating network DTC, see [How to enable network DTC access in Windows Server 2003](#) (KB817064). For more information on how to configure MSDTC in a clustered environment, see [How to configure Microsoft Distributed Transaction Coordinator on a Windows Server 2003 cluster](#) (KB301600).

MICROSOFT SQL SERVER 2005 SP2 AND REPORTING SERVICES

REQUIRED FOR OPERATORS

K2 blackpearl installs operational databases and builds upon the Reporting Services of Microsoft SQL Server 2005 SP2 or greater. The .NET Framework Data Provider for K2 SmartObjects allows custom applications to query SmartObject and workflow data from the K2 blackpearl Server. Report design is supported in the K2 blackpearl Workspace through an AJAX-based designer and in the K2 Designer for Visual Studio. Additionally, any RDL-compatible designer can be used to access K2 blackpearl data, workflow data and SmartObject information to build reports. K2 blackpearl allows importing from and exporting to RDL.

K2 blackpearl provides reporting tools that give everyone the power to create and execute reports based upon corporate information and appropriate level of security. Accessible information may include application or process information that exists within K2 blackpearl applications and information made accessible through the platform's ability to connect with other line-of-business systems. Through dynamic associations, users are shown the objects they request and associated object information.

MICROSOFT WINDOWS XP SP2 OR MICROSOFT WINDOWS VISTA

REQUIRED FOR DESIGNERS, USERS

The K2 Designer for Visual Studio and the K2 Designer for Visio can be installed on Windows XP with SP2 and on Windows Vista. These design environments require that the .NET Framework 3.0 be installed for Windows XP (it is built into Windows Vista).



Note: The design tools and their associated requirements can be installed on Windows Server 2003, though installing these on a server running K2 blackpearl should only be done for development and testing purposes.

.NET 3.0 TECHNOLOGIES

REQUIRED FOR OPERATORS, DESIGNERS

The .NET Framework 3.0 includes a set of managed-code application programming interfaces (APIs) that is an integral part of Windows Vista and Windows Server 2008 operating systems. It is also available for Windows XP SP2 and Windows Server 2003 as a download. The .NET Framework 3.0 includes version 2.0 of the common language runtime, so it is not necessary to install .NET Framework 2.0 before installing 3.0.

.NET Framework 3.0 consists of three major components:

- > Windows Presentation Foundation (WPF) is a user interface subsystem and API based on XML and vector graphics, which uses 3D graphics hardware and Direct3D technologies for an enhanced user interface.
- > Windows Communication Foundation (WCF) is a service-oriented messaging system which allows programs to interoperate locally or remotely, similar to Web services.
- > Windows Workflow Foundation (WF) allows for building of task automation and integrated transactions using workflows.

WINDOWS PRESENTATION FOUNDATION

Windows Presentation Foundation (WPF) offers technologies that allow K2 blackpearl to solve many of the challenging technical hurdles and provide multiple design canvases, specifically the construction of visual design canvasses, better use of the available on-screen real estate, and the ability to use highly visual artifacts to contextualize process-related objects for the non-developer community. For K2 blackpearl developers, an improved development experience is accomplished through a rich set of wizards and full integration with Visual Studio 2005.

WINDOWS COMMUNICATION FOUNDATION

Windows Communication Foundation (WCF), when coupled with K2 blackpearl, provides capabilities that enable a new concept referred to as the Object Publishing Layer (OPL). This technology exposes all K2 blackpearl process artifacts in a service-orientated manner.

In order to develop and participate in a K2.net 2003 process using existing APIs, training and understanding of K2.net and its API was required. In addition, a user needed to understand the process definition and the business objective that particular process was designed to meet.

In K2 blackpearl, the OPL surfaces a process and its client events as full descriptive business objects using Windows Communication Foundation contracts and transport layers. The consumer of the service sees a reference that can be included in a project and a proxy object that represents the logical business object of the process and its available states.



Note: K2 blackpearl OPL will be available in a later release. For the latest information go to www.k2.com.

WINDOWS WORKFLOW FOUNDATION

Windows Workflow Foundation (WF) is not a server or an application. It is the framework used to build an application or a server with workflow capabilities. Windows WF is an in-process engine that runs inside a host process. The host process is responsible for providing a set of services to WF. A wide variety of host processes are available on the Windows platform including console applications, Windows applications, Web applications, Web services applications, SharePoint Server and NT Service applications. Effectively, any executable process can host Windows WF.

K2 blackpearl makes extensive use of the WF API and is capable of hosting both managed (.NET-based) components as well as WF schedules. Out-of-the-box K2 blackpearl events generate WF schedules and provide the ability to communicate with WF schedules generated from other server products such as Microsoft Office SharePoint Server 2007. Adherence to this common infrastructure and platform technology brings many benefits to the K2 blackpearl platform including support for pre-built WF activities and better management of underlying workflow logic. K2 blackpearl provides the tooling that allows business users to create WF-based workflows, extending its usefulness beyond the professional developer.

MESSAGING

REQUIRED FOR OPERATORS

SMTP services are used by K2 blackpearl to send e-mail notifications. Any compatible mail server is supported, such as Windows SMTP, Exchange Server, or third-party SMTP servers that can be installed on Windows Server 2003 SP2 or greater.

A message queuing service is required for the K2 blackpearl Event Bus Server (K2 blackpearl supports Microsoft Message queuing out of the box). The Event Bus Server is used to watch events and send notifications on certain conditions and thresholds, providing a mechanism for reporting business activity and gathering key performance indicators (KPIs) based on current conditions in the business environment.



Note: K2 blackpearl Event Bus features will be limited to notification features at RTM. Additional Event Bus features will be available in the future. For the latest information go to www.k2.com.

INTERNET EXPLORER 6.0 OR 7.0

REQUIRED FOR OPERATORS, DESIGNERS, USERS

Internet Explorer 6.0 or 7.0 for Windows with the latest updates and service packs, if applicable, is required for designing and running reports, browsing the task list in K2 blackpearl Workspace or SharePoint, configuring events and notifications, and managing K2 blackpearl servers.

MICROSOFT VISUAL STUDIO 2005 SP1

RECOMMENDED FOR DESIGNERS

The K2 Designer for Visual Studio is a licensed extension of the Microsoft Visual Studio 2005 environment. Service Pack 1 or greater of Visual Studio 2005 is required. The next release of VS, code-named "Orcas," will also be supported shortly after release. Integrated project management and debugging, multiple design views, a full-featured toolbox, and the K2 Object Browser are some of the main elements of K2 Designer hosted inside the industry-standard development environment.

K2.NET 2003 SP4

RECOMMENDED FOR OPERATORS, DESIGNERS

In hybrid process design, K2.net 2003 templates can be used in the same process as K2 blackpearl components. Hybrid process design is supported, and in some cases, it is the only way in which some processes can function. The following K2.net 2003 integration points are supported through hybrid process design.

- > BizTalk
- > Exchange
- > Web Service and Assembly
- > Data manipulation
- > Exchange Meeting
- > SQL data
- > Document Properties Reader

To install prior version templates in a K2 blackpearl environment, see the K2 blackpearl documentation.



Note: Additional hybrid process design and database migration from K2.net 2003 to blackpearl will be available. For the latest information go to www.k2.com.

MICROSOFT OFFICE TECHNOLOGIES

The Office servers and clients that are listed here are optional components with which K2 blackpearl can integrate. Specific components of the 2007 Office system are optional for different roles, as described in the following sections.

MICROSOFT OFFICE SHAREPOINT SERVER 2007 AND WINDOWS SHAREPOINT SERVICES V3

OPTIONAL FOR OPERATORS

Integration with MOSS 2007 and WSS v3 provides site and user management, content management, and data reporting from within the familiar SharePoint user interface. K2 blackpearl provides custom wizards and templates for different types of sites, such as Publishing sites and Records Centers. Document management is not limited to a single site. Documents can be moved to entirely different sites on different servers, if the process requires it. The K2 blackpearl SharePoint integration also includes security and rights management, SmartObject-data

viewing through the Business Data Catalog (BDC), and the rendering of K2 blackpearl InfoPath forms in a browser by InfoPath Forms Services.

The following integration features require Microsoft Office SharePoint Server 2007:

- > SmartObject and process data search
- > Business Data Catalog*
- > InfoPath Forms Services*
- > Publishing sites and pages
- > Records Management



Note: The starred (*) features are only available in the Enterprise edition of MOSS 2007. InfoPath Forms Services integration, which provides browser-enabled InfoPath forms for user interaction, requires Microsoft Office Forms Server 2007 or the Enterprise edition of MOSS 2007.

The remaining integration features will work with any edition of SharePoint, including Windows SharePoint Server v3:

- > K2 Web Designer for SharePoint
- > Workflow integration
- > Site management
- > User management
- > List and library management
- > Events
- > Document manipulation

INFOPATH FORMS SERVICES

OPTIONAL FOR OPERATORS

InfoPath Forms Services (IPFS), included as part of Microsoft Office SharePoint Server 2007 Enterprise edition or Microsoft Office Forms Server 2007, is required to render InfoPath forms in the browser. IPFS is also required to display custom InfoPath-based workflow forms in Office applications.



Note: A corresponding version of Office 2007 is also required to enable this functionality. The Pro Plus, Enterprise and Ultimate versions include the ability to show custom InfoPath-based workflow forms, the Message Bar, and the Workflows menu item in Word, Excel, PowerPoint and InfoPath.

MICROSOFT OFFICE VISIO 2007

OPTIONAL FOR DESIGNERS

The K2 blackpearl add-in for Visio 2007 allows Visio diagrams to be extended with workflow design capabilities. Through the use of layers instead of stencils, this approach broadens the appeal of designing K2 blackpearl processes from existing Visio diagrams, and eliminates the need to create new diagrams for a single purpose. Processes designed in Visio can be opened later in the K2 Designer for Visual Studio for more advanced functionality. The ability to share a dynamic business application among multiple people of varying skills and preferences is one of the key K2 blackpearl investments.

MICROSOFT OFFICE INFOPATH 2007

OPTIONAL FOR DESIGNERS, USERS

K2 blackpearl employs InfoPath forms for human-based workflow processes. In addition, gathering information with custom InfoPath forms is simplified by allowing the designer to abstract the workflow-specific options from the form template. Through Web service data connections, K2 blackpearl will update the user actions in a form template based on the step in the workflow process. This allows the workflow processes to change without the need to modify and redeploy the form template.

MICROSOFT OFFICE WORD, EXCEL AND POWERPOINT 2007

OPTIONAL FOR DESIGNERS, USERS

The applications of the 2007 Microsoft Office System, Word, Excel, PowerPoint and InfoPath, are capable of displaying workflow notifications in the Message Bar. This allows a user to open a document that is part of a workflow and perform actions within the application. Furthermore, if the workflow forms are based on InfoPath, these applications can display the form above the current document. If the workflow uses ASP.NET forms, users are taken to the site or the form is displayed in a workflow dialog box.

REQUIREMENTS DIAGRAMS

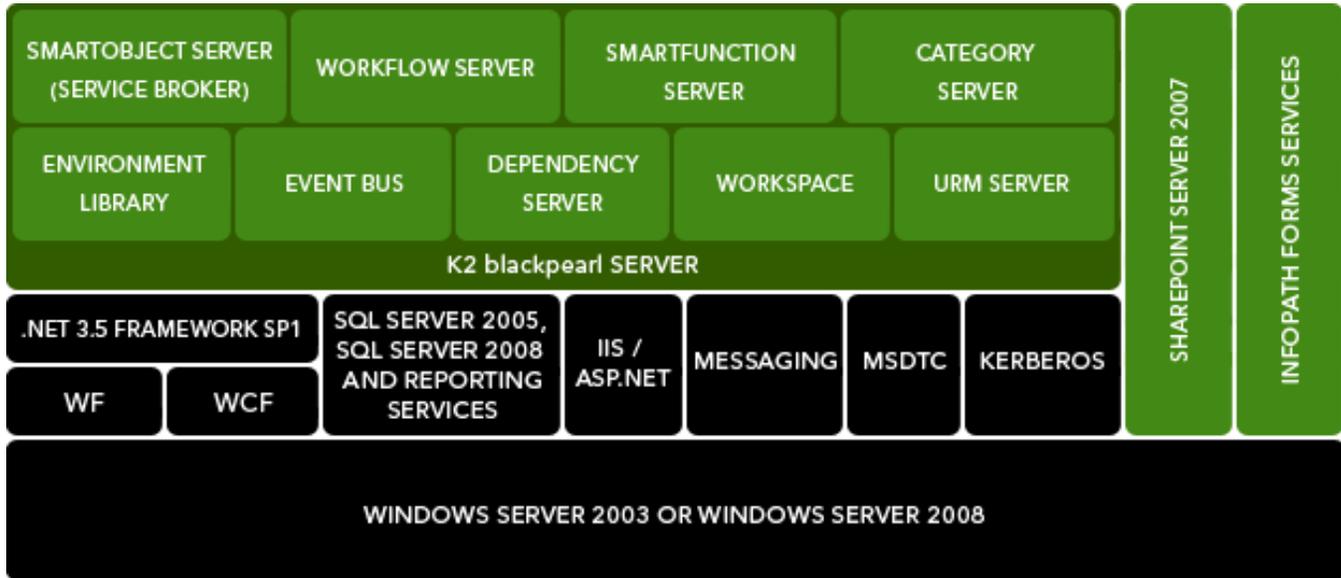


FIGURE 1: REQUIREMENTS FOR OPERATORS (BLACK), THE K2 BLACKPEARL-HOSTED SERVERS (GREEN, HORIZONTAL), AND OPTIONAL SERVER COMPONENTS FOR INTEGRATION (GREEN, VERTICAL)

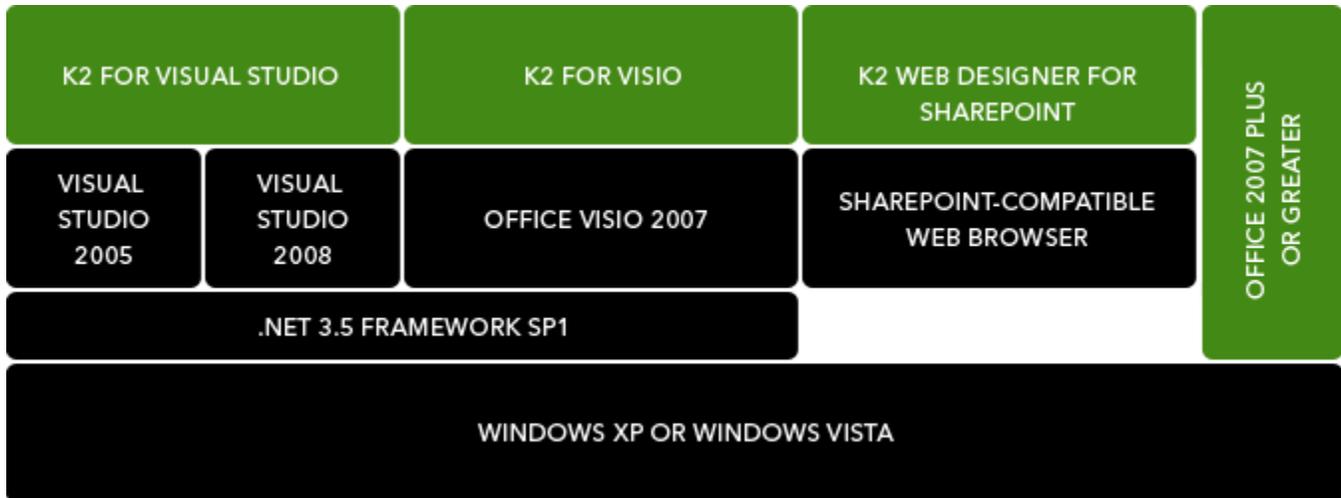


FIGURE 2: REQUIREMENTS FOR DESIGNERS (BLACK), THE K2 BLACKPEARL DESIGN ENVIRONMENTS (GREEN, HORIZONTAL), AND THE OPTIONAL COMPONENTS (GREEN, VERTICAL)