



Blackboard

Blackboard Academic Suite™

Release Notes

(Release 7)
Blackboard Learning System™
Blackboard Community System™
Blackboard Learning System - Basic Edition
Blackboard Content System™

Release Notes (170020en_US)

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INTRODUCTION

About the Release Notes

The Release Notes provide Administrators with the information needed for a successful installation. This includes information on running the Updater, product and browser compatibility, new feature descriptions, and fixed and known issues.

What is in the Release Notes?

The Release Notes contain the following sections:

- [New Features and Enhancements](#) – Describes new features in this release, as well as, additional important enhancements that have been made to the system. This section also includes information about how to enable or disable these features.
- [Compatibility Matrixes](#) – Explains dependencies between the new application and existing Blackboard applications in the field. Also, includes information on which server configurations are supported with this release and which end user browsers and operating systems are supported.
- *Blackboard Academic Suite*[™] [Updater instructions](#) – Describes general information about the *Blackboard Academic Suite* Updater and explains steps for running the Updater.
- [Reference materials](#) – Lists and describes reference manuals available for this release.
- Resolved Issues from previous releases and Known Issues in the current release can be found in separate reports. Please check Behind the BlackboardSM for more information.

NEW FEATURES AND ENHANCEMENTS

Overview

Blackboard Academic Suite (Release 7) introduces a number of architectural changes to the application. This work completes the internationalization of the application through the support of multibyte characters and creates new installers and updaters. This release also includes a number of new features and enhancements to the *Blackboard Academic Suite*.

With the support of multibyte languages, Blackboard provides an upgrade path for clients using *Blackboard Learning System* ML to move to *Blackboard Academic Suite* (Release 7). This process uses a tool designed to batch convert user and course data.

This section reviews the new features in Release 7, explains their default availability upon installation, and specifies Blackboard license requirements.

New features and enhancements fall into the following categories:

- [Internationalization](#)
- [Installers and Updaters](#)
- [Language Packs](#)
- [Quick Tutorials](#)
- [Blackboard Backpack](#)
- [Blackboard Community System](#)
- [Store, Retrieve, and Copy Course Content](#)
- [Email](#)
- [Blackboard Content System](#)
- [Virtual Installations](#)
- [Release 7 Changes](#)

INTERNATIONALIZATION

Multibyte character support

Multibyte support involves behind-the-scenes changes to the database and files throughout the system. These changes happen automatically during the update process. Clients in countries around the world can now use the *Blackboard Academic Suite* in their native languages. Multibyte characters support languages that use characters other than the Western European characters supported by the ISO-8859 standard supported in Release 6.3. For example, Japanese and Chinese language packs are available with Release 7. Multibyte support allows all clients to teach language programs and incorporate content from multibyte languages selectively throughout the *Blackboard Academic Suite*.

Additional Information

The following are some additional notes about multi byte support in the *Blackboard Academic Suite*:

- Character mapping is not exact because there are different (and sometimes competing) character encoding standards. For example, Windows applications use a proprietary character set called CP1252. Users might include these characters in their Blackboard data, for example by cutting and pasting from a Microsoft Word document into a Blackboard text field. Therefore when the system is updated to *Blackboard Academic Suite* (Release 7), the database will be scanned for characters that would not be mapped correctly in the new multibyte database, and if found, these characters will automatically be remapped. Please note that CP1252 characters that appear in Assessments are handled differently and will only appear correctly if they are HTML escaped.
- Sorting is handled differently by UNIX systems and Windows systems. In UNIX, characters that are not A-Z sort after A-Z (for example., ándre will be after Z). In Windows, similar characters sort together (for example, ándre will be with the other A's). In both UNIX and Windows, multibyte characters sort to the bottom of the list. Multibyte characters that were entered in the system prior to *Blackboard Academic Suite* (Release 7) (before these characters were supported) sort to the top of the list, before A-Z, because in prior releases multibyte characters were “translated” to a non-multibyte strings.
- Search fields throughout the *Blackboard Academic Suite* handle multibyte characters in *Blackboard Academic Suite* (Release 7). However, multibyte characters that were entered in the system prior to *Blackboard Academic Suite* (Release 7) cannot be searched for in *Blackboard Academic Suite* (Release 7). A search for these characters in a prior release worked because the page encoding and the database encoding both “translated” the characters into a non-multibyte string. But in *Blackboard Academic Suite* (Release 7), multibyte is correctly handled as multibyte and therefore the “translated” character stored in the database will not come up as a search match with the multibyte character that is entered in the search field.
- File names for files stored in the *Blackboard Academic Suite* can contain multibyte characters. In some extreme cases, the file name will be too large for the system to store, in which case the file name will be converted to a shorter string for behind-the-scenes storage. This change is invisible to the user, who will always see the correct, full-length file name. However, in these cases Administrators will not see the correct file name if they directly access the file server. This occurs only on file names over approximately 100 characters—the size varies depending on how many multibyte characters the file name includes.

Default Availability: This feature is transparent to users. For those who already use multibyte characters and files, they will be able to seamlessly use multibyte data in the *Blackboard Academic Suite*. For those who do not use multibyte, the system will appear to be no different than it was in earlier releases.

Product Requirements: Multibyte characters are supported throughout the *Blackboard Academic Suite*.

Blackboard Learning System ML to Blackboard Academic Suite (Release 7) Conversion Tool

The Conversion Tool is designed exclusively for *Blackboard Learning System ML* clients as an easy method to batch convert user and course data from their current system to *Blackboard Academic Suite (Release 7)*. This tool is only used when the client is ready to populate a new *Blackboard Academic Suite (Release 7)* installation with data from their existing *Blackboard Learning System ML*.

Default Availability: The Conversion Tool is available as a separate download from Blackboard .

Product Requirements: The Conversion Tool is used to transfer Course and User data from the *Blackboard Learning System ML*. The Conversion Tool requires a separate server as both systems must be running during the conversion process.

Glossary and Gradebook File Downloads

Exported Glossary and Gradebook files are now encoded using Unicode to allow for multibyte characters. This requires that the default file type for download is now a tab-delimited .xls file that can be opened and edited directly in Microsoft Excel. Files may also be downloaded as a comma-delimited .csv file. Please keep in mind that .csv files must be imported into Microsoft Excel or another appropriate application before editing.

Batch File Uploads

Batch files are delimited flat files containing user, course, or enrollment data that conform to IMS standards. To accept multibyte information, files must be in Unicode format. All Unicode formatted files must include the Byte Order Mark (BOM). If a BOM is not specified, the system reads it as ISO-8859-1.

The supported formats are as follows:

- UTF-8
- UTF-16LE
- UTF-16BE
- ISO-8859-1

ASCII is also still a supported format.

INSTALLERS AND UPDATERS

Installer and Updater

Prior to *Blackboard Academic Suite* (Release 7), each Release, Application Pack, Service Pack and Hotfix had to be downloaded and installed sequentially in order for an administrator to install or update the *Blackboard Learning System*. The *Blackboard Content System* was installed and updated separately, on top of the *Blackboard Learning System*.

With the new installer and updater, a single package will bring a client up to the latest version of the *Blackboard Academic Suite*. Additionally, the entire *Blackboard Academic Suite* (*Blackboard Learning System*, *Blackboard Community System*, and *Blackboard Content System*) is installed or updated as a single package depending on what products are licensed. For example, if the *Blackboard Content System* is the only product licensed, the install and update processes will be the same as if all three separate products were licensed.

Existing *Blackboard Content System* clients and those clients with a Developer Edition license will be the only clients that require a new license before updating to *Blackboard Learning System* (Release 7). Previously, two license key files were required. Now, one license key file will be provided containing all of the information for updating the *Blackboard Content System*. Please contact your Blackboard Account Manager for a new license key file.

LicenseReplace Tool

The LicenseReplace tool has been deprecated with *Blackboard Academic Suite* (Release 7). Any user with *Blackboard Academic Suite* (Release 6.3) who is updating to a newer version will not need to use this tool. The Updater will allow the user to provide a new license at any time—before upgrading or during the lifecycle of the current version. If the new license indicates an upgrade (for example, more products were acquired), then the Updater will change the application to allow access to that product in the *Blackboard Academic Suite*. For example, if a user is running the *Blackboard Learning System* and then purchases the *Blackboard Community System* and *Blackboard Content System*, they will simply provide the new license to the Updater, and continue with the update.

LANGUAGE PACKS

Manage Language Packs (Formerly named Locales)

Locales have been renamed Language Packs. In *Blackboard Academic Suite* (Release 7) the availability of Language Packs is managed through the Manage Language Packs page; in prior releases this was managed through the Manage Locales page. Administrators may copy, remove, import, and export Language Packs from the Manage Language Packs page. This allows Administrators to work with multiple Language Packs on the system at once.

Release 7.0 includes the following Language Packs:

- de_DE (German)
- en_US (American English)
- es_ES (Spanish)
- fr_FR (French)
- it_IT (Italian)
- jp_JP (Japanese)
- nl_NL (Dutch)
- zh_CN (Chinese, simplified)

Product Requirements: Clients with *Blackboard Learning System*—Basic Edition are limited to using the United States English Language Pack and one other Language Pack. There are no limits to the number of Language Packs with the *Blackboard Learning System*, *Blackboard Community System*, or the *Blackboard Content System*.

Language Pack Editor

The Language Pack Editor provides clients with the functionality necessary to create new Language Packs or modify existing Language Packs. Clients can now share and customize Language Packs to meet their individual, national, international, and consortium needs. Administrators may copy or import an existing Language Pack and use the Language Pack Editor to modify the existing text bundles and text strings. Once the new Language Pack is created it may be used on the system and shared with other Blackboard clients.

Translators also have the option of using Image Editors and other Text Editors (aside from the Language Pack Editor) to create and modify Language Packs.



NOTE: Please note that the eight Blackboard supported Language Packs may be copied and imported; they may not be modified.

Default Availability: The Language Pack Editor is available by default to System Administrators. Follow these steps to make the Language Pack Editor unavailable:

- 1 Select **Manage Tools** on the Administrator Panel.
- 2 Click **Modify** next to **Language Pack Editor**.
- 3 Click **No** and select **Submit**.

Product Requirements: The Language Pack Editor is available to clients with the *Blackboard Learning System*. It is not available with the *Blackboard Learning System*—Basic Edition.

QUICK TUTORIALS

Embedded Quick Tutorials

Quick Tutorials consist of a set of modules and links that direct Blackboard users to a series of self-guided multimedia tutorials. The following three modules have been added to the *Blackboard Academic Suite*:

- Quick Tutorials – Key Capabilities
- Quick Tutorials Catalog
- Quick Tutorials – New Product Enhancements

Links to Quick Tutorials appear on the Control Panel and the Administrator Panel and as a module for users. Make the module unavailable to turn off access to Quick Tutorials through a tab. Administrators and Instructors may still access the tutorials through the Admin Panel and the Control Panel.

Default Availability: All three modules appear by default on the My Institution page. Administrators may disable these modules from **Manage Modules** on the Administrator Panel or place them on a different tab.

Product Requirements: Embedded Quick Tutorials are supported throughout the *Blackboard Academic Suite*.

BLACKBOARD BACKPACK

Blackboard Backpack

Blackboard Backpack™ is a software application that enables users to synchronize their Blackboard materials for offline use. Using this powerful learning tool, Students can access their learning materials from anywhere at anytime, without having to have an Internet connection.

The following items are synchronized from Courses and Organizations:

- Course and Organization Content
- Announcements
- Calendar items
- Tasks



NOTE: Content stored in the *Blackboard Content System* is not synchronized.

Users access this software through Download buttons and links in the *Blackboard Academic Suite*. Administrators can control the availability of the Download buttons and links, as well as the availability of the tool itself. Backpack includes Download Controls so Administrators can create settings for synchronization.

Default Availability: The ability to use the Blackboard Backpack tool is available by default. Blackboard Backpack options and Download Controls may be modified through **Blackboard Backpack** on the Administrator Panel.

Product Requirements: The Blackboard Backpack is available at an additional cost to all clients with the *Blackboard Learning System*. The Blackboard Backpack client application works with Microsoft Windows XP.

BLACKBOARD COMMUNITY SYSTEM

Changes to the Community System

A number of enhancements have been made to the *Blackboard Community System* to create an improved and more consistent user experience.

- Users may now upload images and other types of files to HTML modules through the Visual Text Box Editor. Please note that files uploaded to HTML modules are not exported with the module, so such a module will have broken links when imported.
- The Courses, Community, and Services tabs are now module tabs. This allows users to have more control over the content and layout of these tabs.
- A number of new modules were created. These include a Discussion Board, a Course Catalog module, and an Organization Catalog module. These new modules may be placed on other tabs and will appear in the Manage Modules page.
- The My Courses module now includes Instructor names for each course, and allows Administrators to enable or disable the display of any of the information in the My Courses module by default. It is also possible to enable the display of unavailable courses in which students are enrolled.
- Guest access to the Courses Tab is toggled on and off from the Tab Properties page. In past releases, Guest Access to the Courses Tab was enabled from the Manage Tools page on the Administrator Panel.
- Administrator pages for allowing users to create Courses, Organizations, and Discussion Boards (on the Community tab) have been replaced with three new modules; the Course Creation module, the Organization Creation Module, and the Discussion Board Creation Module. These modules are not available by default; Administrators may make them available through **Manage Modules** on the Administrator Panel.

STORE, RETRIEVE, AND COPY COURSE CONTENT

Changes to Import, Export, Archive and Restore

In *Blackboard Academic Suite* (Release 7) the import, export, archive and restore processes are asynchronous. This means that users do not have to wait in the browser window while the operation takes place. This is more efficient for users because the operations are queued and managed in the background. When one of these tasks is executed, the system completes it in the background and sends the user an email upon completion. The new process for Export and Archive matches the process for Course Copy.

The new Export / Archive Manager, available on both the Administrator Panel and the Control Panel for individual courses and organizations, makes it easier for users to manage these operations. This page lists all of the packages that have been created for the course, including detailed logs for the package processes. The user can export and archive the course multiple times and keep multiple backups of the course. The user may also remove packages that are no longer needed.

Course Copy changes for Course Cartridges

The Copy Course Materials into a New Course and Copy Course Materials into an Existing Course features now include an option to include protected Course Cartridge content. Instructors and Administrators can choose whether or not they would like to include cartridge content in the copy operation. If this option is selected, the content may be accessed in the copied course by users with a valid Student Access Key.

When copying course materials into an existing course, the system will check to confirm that both courses contain the same Course Cartridge. If they do, the selected course sections will be copied including any protected Course Cartridge content. If the courses contain different Course Cartridges, only non-Cartridge materials will be copied and the user will be given a message stating there was a Course Cartridge conflict.

EMAIL

Changes to Send Email

A number of enhancements have been made to the Send Email feature:

- Email logs, not included in the *Blackboard Academic Suite* (Release 6.2 and Release 6.3), returns in Release (7). The log, available through the Logs feature on the Admin Panel, will save a record of all successful and failed emails sent by the system.
- Improvements have been made to the handling of users and attachments in emails. In email forms where users may select email recipients from a list of users, options to select multiple users are now available. An improved file selector is now used on all email forms where attachments may be added from outside of the *Blackboard Content System*. The new field allows users to attach multiple files to an email without redirecting the user to another page.
- The Email tool is applied consistently using the same interface and options throughout the application. The only difference between implementations of the Email tool across the system is the recipients the sender can target. Email tool performance is testing faster than previous releases and the Email tool includes more robust error reporting.
- A new property enables JIS encoding for clients using the Japanese Language Pack. Administrators can specify the type of encoding that should be used by Blackboard email: UTF-8 or JIS. The encoding method specified will then be used by any email sent from a location where Japanese is the dominant locale. For example, if the System Administrator specifies that JIS encoding should be used for Japanese emails, then all emails sent from a course where Japanese is the forced language pack will be encoded with JIS, even if all other parts of Blackboard are using a different language pack for which UTF-8 encoding would be used.
- The Email log has moved to `/blackboard/logs/bb-email-log.txt`.

BLACKBOARD CONTENT SYSTEM

Changes to Sharing Files and Portfolios

The lifetimes for Passes and Portfolios shared with external users is user-definable in Release 7. Previously, the lifetime option was a dropdown list of options, such as 1 day, 1 week, or 10 years. Now, the user may specify the lifetime by entering the desired number of hours, days, weeks, months, or years. An additional option has been added called No Expiration. If this option is selected, the Pass will be active until it is removed from the system.

A File Information page has also been added for Read Only Passes that is similar to the File Information page for Read/Write Passes. Users also have the option of directing recipients of Read Passes to a File Information page. This File Information page includes:

- the file name
- file location path
- a link to open the file
- a link to Comments (if Comments are shared)

Default Availability: The default for a Pass or a Portfolio Shared with external users is No Expiration.

Product Requirements: These features are available in the *Blackboard Content System*.

push-cs-config-updates

The push-cs-config-updates command line tool has been wrapped into the PushConfigUpdates command found in the blackboard/tools/admin directory.

VIRTUAL INSTALLATIONS

Changes to Virtual Installations

Virtual Installations have been modified so the Root Administrator may configure the database connection pool size to improve scalability. The Root Administrator may now set minimum and maximum database connection pool sizes for each Virtual Installation.

Default Availability: The Manage Root Installation link only appears on the Administrator Panel if the user is logged in as the Root Administrator and the system was installed with a license key permitting Virtual Installations.

- 1 Select **Manage Root Installation** on the Administrator Panel.
- 2 Select **Manage Virtual Installations**.
- 3 Select **Modify Virtual Installations**.

Product Requirements: Virtual Installations are only available with *Blackboard Learning System*. Virtual Installations are not available with *Blackboard Learning System –Basic Edition*.

BLACKBOARD ACADEMIC SUITE RELEASE 7 CHANGES

Overview

Blackboard Academic Suite (Release 7) includes a number of minor changes to the *Blackboard Academic Suite*.

List of Changes

- The Resource Center has been removed from the Blackboard Learning Center.
- Passport Authentication is no longer supported.
- Netscape 4.7 is no longer a supported end-user browser.

COMPATIBILITY MATRIXES

Overview

This section of the document includes information on the following:

- [Server Compatibility Matrix](#) – Explains which server configurations are supported with this release. For example, the required versions of databases and operating systems are included here.
- [End User Compatibility Matrix](#) – Reviews which end-user browsers and operating systems are supported with this release.

SERVER COMPATIBILITY MATRIX

Server Compatibility

Server software must meet certain requirements before installing the *Blackboard Academic Suite™* (Release 7). The following are important to keep in mind when setting up the server software:

- The database is run on a separate server when using two or more servers. Thus, appropriate client tools for the database must be installed on the Web/Application server or servers when using a configuration with two or more servers.
- Certified configurations are fully tested and supported.
- Compatible configurations are partially tested but should function properly.



NOTE: Clients running the *Blackboard Academic Suite* on a Windows Operating System, must install the .NET framework if they plan on using .NET Building Blocks.

Certified Server Configurations

WINDOWS	SUN SOLARIS	RED HAT LINUX
Microsoft® Windows® 2003 Server	Sun® Solaris™ 9	Red Hat® Linux® Advanced Server 3.0*
<ul style="list-style-type: none"> • Microsoft® SQL Server 2000 Enterprise Edition (SP3a) or Microsoft® SQL Server 2000 Standard Edition (SP3a) • Microsoft® Internet Information Server (IIS) 6 (not included with Blackboard) • Java 2 Platform, Standard Edition Version 5.0 	<ul style="list-style-type: none"> • Oracle 10g (Release 1) • Java 2 Platform, Standard Edition Version 5.0 	<ul style="list-style-type: none"> • Oracle 10g (Release 1) • Java 2 Platform, Standard Edition Version 5.0

* Please see the *Setup Guide* for information on setting up Red Hat Linux Advanced Server 3.0 with the *Blackboard Academic Suite*.



NOTE: UNIX systems running *Blackboard Learning System – Basic* must use Small-Scale Oracle 9i.

Compatible Server Configurations

SUN SOLARIS	SUN SOLARIS	SUN SOLARIS
Sun® Solaris™ 10	Sun® Solaris™ 10	Sun® Solaris™ 9
<ul style="list-style-type: none"> • Oracle 10g (Release 1) • Java 2 Platform, Standard Edition 5.0 	<ul style="list-style-type: none"> • Oracle 9i version 9.2.0.6 • Java 2 Platform, Standard Edition 5.0 	<ul style="list-style-type: none"> • Oracle 9i version 9.2.0.6 • Java 2 Platform, Standard Edition 5.0

RED HAT LINUX	RED HAT LINUX
Red Hat® Linux® Advanced Server 3.0	Red Hat® Linux® Advanced Server 2.1
<ul style="list-style-type: none"> • Oracle 9i version 9.2.0.6* • Java 2 Platform, Standard Edition 5.0 	<ul style="list-style-type: none"> • Oracle 9i version 9.2.0.6* • Java 2 Platform, Standard Edition 5.0

- Non-English applications, both operating systems and databases (such as a Chinese-language version of Oracle), are considered compatible with *Blackboard Academic Suite* (Release 7). These systems have not undergone official Blackboard Product Development testing.
- The Blackboard Academic Suite (Release 7) products ship with Apache HTTP Server Version 1.3.33 (UNIX operating systems only).
- The Blackboard Academic Suite (Release 7) products ship with Perl 5.6.1 / Perl Ex 2.3.1

*Oracle patch 3006854 must be installed before installing Oracle 9i on Red Hat Linux ES 3.0. The patch is available from Oracle.

END USER CONFIGURATION MATRIX

End User Configuration Guidelines

End users must use a certified or compatible operating system and browser configuration with the *Blackboard Academic Suite*.

		WINDOWS® OPERATING SYSTEMS		MAC® OPERATING SYSTEMS****	
		2000**	XP	10.2	10.3
MICROSOFT® INTERNET EXPLORER® WEB BROWSERS	5.2	N/A	N/A	C	C
	5.5	N/A	N/A	N/A	N/A
	6.0	C	✓	N/A	N/A
NETSCAPE® AND MOZILLA® WEB BROWSERS	NS 4.78	N/A	N/A	N/A	N/A
	NS 7.1***	C	C	C	C
	Firefox 1.0.x***	C	✓	C	✓
APPLE® SAFARI® WEB BROWSERS	1.0	N/A	N/A	C	N/A
	1.1	N/A	N/A	N/A	C
	1.2	N/A	N/A	N/A	✓

KEY	
✓	Certified – fully tested and supported
C	Compatible – key application areas tested
N/A	Not tested – specified Browser is not supported for the Operating System

* All configurations marked as Compatible and have undergone a limited engineering analysis to test areas of the *Blackboard Academic Suite* that may have browser issues. Additional information on known browser issues may be found in the Knowledge Base.

** Microsoft Windows 2000 supported configurations are considered compatible when run on Windows 95, Windows 98, and Windows ME.

*** Gecko is the shared rendering engine at the heart of the Firefox 1.0, Netscape 7.1 and Mozilla 1.5 browsers, which are all considered compatible browsers. Only Firefox has undergone testing that qualifies it as Certified.

**** The Safari Web browser and the Gecko browsers for Mac do not currently fully support the Live Connect technology used by some features in the *Blackboard Learning System*. The Equation Editor, Collaboration tool and SCORM Content type may experience issues when these browsers are used. See the Knowledge Base articles 181-2429, 181-2428, 181-2431, 181-2432 for detailed information.

***** The Visual Text Box Editor is only available to users with Microsoft Internet Explorer.

SUPPORTED PATHS FOR IMPORTING AND RESTORING COURSES

Supported Paths for Blackboard Academic Suite Release 7

The table below identifies the supported paths for importing or restoring a course that was exported or archived from an earlier version. Certified paths are fully tested and supported by Blackboard. Compatible paths are not fully tested but should function correctly based on past performance.

SOURCE*	SUPPORT
Academic Suite Release 7	Certified
Academic Suite Release 6	Certified
Blackboard ML	Certified
Blackboard 5.5**	Certified
Blackboard 5.0**	Compatible
CourseInfo 4	Not Supported

*Paths for Importing and Restoring courses are not backward compatible. Courses may be Imported or Restored to a newer version, but courses from a newer version may not be Imported or Restored to an earlier version.

**Blackboard 5 and Blackboard 5.5 did not include an Archive and Restore function. Courses from these releases may be imported but courses cannot be restored with user data and interactions intact.

BLACKBOARD ACADEMIC SUITE (RELEASE 7) UPDATE INSTRUCTIONS FOR WINDOWS

Overview

The Release 7 Updater has been completely redesigned for easy and reliable updates from Release 7 forward. The Release 7 update requires a database conversion to work with multibyte characters. This conversion will require the process to take more downtime than most updates. Please read through database conversion and Updater instructions carefully before planning and executing the process.



NOTE: The Updater must be run against Release 6.3.1.424 or higher. Please install the latest 6.3 service packs before attempting to update.

Topics

This section on updating the Blackboard Academic Suite on a Windows platform includes the following topics:

TOPIC	DESCRIPTION
Database Changes from Release 6.3 to Release 7	The Update from Release 6.3 to Release 7 includes a major update to the database to support multibyte characters.
Planning the Conversion	The database conversion requires careful planning and time management.
Best Practices	Ensure that the data on the system is backed up and easy to restore.
Conversion Worksheet	The Conversion Worksheet is a helpful planning tool during the database conversion process.
Pre-Update Change Report	The Pre-Update Change Report details the changes that will be made during the update. It also verifies that the system is ready to accept the update.
Preparing the Database for Update, SQL Server	Several steps must be completed to prep the database prior to running the Updater.
Run the Release 6.3 to Release 7 Updater	Instructions for running the Updater. Be sure to prepare the database before running the Updater.
Update Windows File Sharing from DFS to UNC	Release 7 supports UNC shares for accessing content files stored on a separate server. The file sharing must be changed to UNC before using Release 7.
IIS 5.0 Compatibility Mode No Longer Supported	Release 6.3 required that IIS 6.0 be run in IIS 5.0 Compatibility Mode. Release 7 requires IIS 6.0 and does not support IIS 5.0 Compatibility Mode.

DATABASE CHANGES FROM RELEASE 6.3 TO RELEASE 7

Overview

The *Blackboard Academic Suite* (Release 7) supports multibyte characters so that users can work in any language and administrators can create Language Packs to support any language. As a result, databases undergo architectural changes to support multibyte characters. These architectural changes make up the database conversion.

Change the Datatype of Database Columns

The Release 7 Updater changes the datatype of any database column that may need to store multibyte characters. Typically, these are columns that store labels, text, and other information entered by the user. The Updater does not change the datatype of any column that does not need to be changed.

Changing only those database columns that may store multi-byte characters ensures that the database growth associated with supporting multi-byte characters is as limited as possible. It is still prudent to expect the Release 7.0 database to require twice as much space as the Release 6.3 database.

National Character Set

Release 7 requires that Microsoft SQL Server use the UCS-2 character set and that Oracle use the AL16UTF16 database for the national character sets. UCS-2 is the standard national character set for Microsoft SQL Server so those systems running on Windows do not need to update the national character set. Oracle users must change the national character set from UTF-8 to AL16UTF16 before running the update.

Multibyte Passwords

Release 7 includes support for encrypting multibyte passwords.

File Storage

Multibyte file names may be too long to be handled by the server operating system. The database will store the file name as it is entered by the user. The file name will be converted to work with the operating system and stored on the file server. Within the interface, this will be invisible to users. As an administrator, know that the file names on the file server are may not appear with the same file name that appears to users in the user interface. The file names are read by the database and matched to the file name that the user entered when uploading the file.

PLANNING THE CONVERSION

Sizing the Conversion

The conversion modifies 22 percent of all available columns in the Blackboard schema. Many of these columns store the bulk of the data in the Blackboard schema. It is recommended that clients allocate up to 2 times the amount of database data and index file storage than the present state of the data before the conversion. The Updater tool will stop if the calculated space expectations noted in the undate-log.txt file are not available. Databases configured for auto-extension must be configured with the appropriate amount of allocated space. The Updater will also require temporary space. Not all of this space will be used, but should be made available. As part of the conversion, the Blackboard Updater performs a database data file size check to ensure accurate storage needs are available prior to executing.



NOTE: Please note that the Updater requires database storage to be allocated before running. Databases configured for auto-extension will need to accommodate fixed available and free storage in advance.

Most of the conversion takes place at the database layer. Some file system changes take place, but for the most part, file system storage needs for the application and file system content will remain consistent. Nonetheless, clients should anticipate a minor change in the size of the file system.

Planning for Operational Downtime

It is important to understand that the conversion process will require operational downtime, or time when the application is unavailable to users. This downtime varies based on how much data is contained within the database and whether the bulk of the data exists in the columns to be converted. The sections below include suggestions for reducing the overall amount of operational downtime. Many of these suggestions involve minimizing the size of the database by removing unnecessary data and/or archiving data using Blackboard's internal tool sets.

Below is a short summary of how much downtime should be expected given the size of database content. The expected down times for the deployment of Microsoft SQL Server and Oracle are provided. The overall size column refers to both Data and Index space. Transaction, rollback or undo space is not included. The estimates in the table below are based on Blackboard internal testing and testing by our Beta partners.

Overall Size	Expected Down time (Windows)	Expected Down Time (UNIX)
Less than 5 GB	Under 1 Hour	Under 1 Hour
5GB to 10GB	Under 2 Hours	Under 5 Hours
10GB to 25GB	Under 10 Hours	Under 15 Hours
25 to 50GB	24 Hours	36 Hours
50 to 150GB	36 to 60 Hours	48 to 72 Hours

The difference in time between a Windows conversion and a UNIX conversion is due to extra operations tied to data validation that are built into SQL Server but are required for data integrity on Oracle. Less than 1 percent of all Blackboard deployments are greater than 100GB of database storage. Most deployments (greater than 93 percent based on client sampling) fall in the 5 to 25GB range, subsequently requiring less than a day of operational downtime. Plan for the time above and factor in additional time for system maintenance and testing in accordance with operational best practices at the institution.

Conversion Logging

The database column conversion is logged in multiple locations. The first location is in the blackboard/logs/install directory. The second location is in the bb7-installer-log.txt file. These two log files are useful for administrators to review for troubleshooting and to keep as an archive of the upgrade. The

database column conversion is also stored in the database schema. The conversion portion of the Updater is stored in the database in case something happens to the Updater and it does not complete. If the Updater does not complete, review the bb7-installer-log.txt for information on why the Updater did not complete. The Updater is designed so that it can be restarted and will resume from the point where it encountered an error.

Planning for the Unexpected

The Updater has been designed to handle failures and pick-up where it last left off. As an administrator, always plan for the unexpected. The best way to plan for the unexpected is to plan for the conversion.

Develop a Project Plan

Start by developing a project plan tasked out with major milestones and expected dates of execution and completion. Try to factor in some extra time and resources as preventative management.

Create a Back-Up and Recovery Plan

Develop a back-up and recovery plan in case you need to return back to your last working Blackboard configuration. Back-up the database, content, installation files and license files. It is always a good idea to have the installer on-hand if you need to reinstall and restore your content and database files. It is a good idea to practice the back-up and recovery operations on a test server. Practice restoring the back-up of the 6.3 environment before running the conversion (update).

Test the Conversion in Advance

Although the hardware in the development/test environment may be different from the production environment, it is a good idea to practice the conversion as much as possible. Test the conversion more than once to ensure that everything is working as expected. Use this time to estimate how much downtime will be needed when the production system needs to be updated. Blackboard recommends testing the conversion on a copy of the production database.

BEST PRACTICES

Back-Up and Recovery

Creating a back-up is always a recommended best practice before manipulating data. Before running a conversion (test or production), make a full back-up of the database and file system content, and verify that the system can be restored successfully. Successfully going through the back-up and recovery process a few times will assist with capacity planning and unexpected failures for any reason.

Blackboard recommends shutting down or disabling any automated processes so that they do not conflict with the conversion effort.

Archive, Remove, Convert, then Restore

The more data stored in the system, the more conversion time required. This conversion might be an opportunity to clean up the data on the system. There is a good chance that much of the data within the application is unused or outdated.

Work with the appropriate people at your institution to determine a plan that includes archiving data, removing it, and then running the conversion against important data only. After the conversion is successful and before making the system available, restore any relevant archived data while the system is running. As always, before removing the data, verify that a back-up exists.

Purge the Activity Accumulator

The statistics maintained in the `ACTIVITY_ACCUMULATOR` table grows at an astounding rate based on instrumentation programmed by professors into their courses and content items, as well as statically defined within the Blackboard code for key transactional operations. Many Blackboard deployments use the data in this table for reporting purposes. While the data is valuable, it is often perceived as disposable. The conversion of this data can be time consuming and in many cases offers an opportunity to speed up the conversion effort by eliminating it via a delete operation. There are two representations of this table for the *Blackboard Learning System* implementations found in the `BB_BB60` schema and the `BB_BB60_STATS` schema. Both can be deleted using a simple ***truncate table ACTIVITY_ACCUMULATOR*** statement in the database. As always, before you remove the data, verify that a back-up exists. Also, be aware that this will reset the Organization Statistics reporting to 0.

CONVERSION WORKSHEET

Below is a sample conversion worksheet that steps through the planning, testing and execution process of the 7 upgrade. This is not a comprehensive list, but rather a list of activities that should occur before making the upgraded Blackboard product available to users.

Step	Conversion Task	Owner	Important Dates	Notes/Dependencies
1	Download and read the Release Notes for Upgrading from 6.3 to 7.			
2	Request the Blackboard 7 Updater Binary and License File			
3	Plan for 7 Update			
4	Schedule Operational Downtime for production conversion			
5	Develop a Back-Up and Recovery Plan (if none exists)			
6	Practice Back-Up and Recovery against a test server			
7	Identify data for archival purposes			
8	Back-up production data			
9	Archive and Remove data			
10	Purge Activity Accumulator Data			
11	Run the 7 Updater Reporting Tool (Option #2 of the Updater)			
12	Notify all users and related parties about downtime			
13	Disable access to the application			
14	Disable database back-up processes and automated tasks.			
15	Change the database character set			
16	Add database and/or file system storage if needed			
17	Run the conversion using Option #1 of the Updater.			
18	Follow along with the conversion from the installation console or the log file(s).			
19	After the conversion completes, verify the application starts and all configuration settings remain the same.			
20	Check the log files for any issues.			
21	Check the state of the database and file system to ensure enough storage is available once the system is enabled.			
22	Restore archived data if needed.			
23	Run through any functional or technical tests before deployments.			
24	Verify all automated processes and/or any other administrative operational responsibilities are enabled and working, such as back-ups and maintenance tasks.			
25	Enable Blackboard and notify users.			

PRE-UPDATE CHANGE REPORT

Overview

The Pre-Update Change Report reviews the currently installed system to ensure that it meets the requirements for the update. It then reports its findings and a list of all the file changes that will occur when the Updater is run.

Running the Pre-Update Change Report is an important step before running the Updater.

Run the Pre-Update Change Report, Windows

Follow these steps to run the Pre-Update Change Report.

- 1 Click on the Updater file to launch it or open a command-line prompt and navigate to the directory that holds the Updater.
- 2 Run the following command to launch the Updater:

```
C:\bb_updater>java -jar <updater_file>
```

To launch the Updater and use the command-line interface, run the following command (the following steps assume that the GUI Updater is used):

```
C:\bb_updater>java -jar <updater_file> -text
```

- 3 A welcome message will appear with a reminder to read the release notes and the installations instructions completely before updating. Click **Next** to continue.
- 4 The first Updater page asks where the Blackboard Installation Directory is found. Click **Next** to accept the defaults or enter new values and then click **Next**. If The *Blackboard Academic Suite* is not found in the directory provided, the Updater will attempt to install at the given location.
- 5 The next prompt presents several options. The options are **Update**, **Provide new License file**, **Pre-Update Change Report**, **Uninstall Blackboard Academic Suite**, and **Uninstall appserver**. Select **Pre-Update Change Report** and click **Next**.
- 6 The update-report.log file will appear in the Updater directory. This file includes important information on what changes will occur when the Updater is run.

PREPARING THE DATABASE FOR UPDATE, SQL SERVER

Overview

Clients must prepare the database before running the Updater. The database must use the appropriate character set and have enough available space to handle the larger database.

Preparing a Microsoft SQL Server Database

Complete the following tasks to prepare a SQL Server database before updating to Release 7.

STEP	DESCRIPTION
Plan downtime	The update process will require several hours.
Backup the database	Backup the database and test the restore procedure to ensure that the Release 6.3 database can be restored without errors. If the database conversion fails the database may be left in an unusable state. This step is critical!
Change the Recovery Model to SIMPLE	The Recovery Model must be set to SIMPLE. This will speed up the Update process by disabling the need for a large transaction history.
Run the Pre-Update Change Report	Run the Updater and use the Pre-Update Change Report option. This will check the database and report how much disk space and transaction space is required.
Add disk space for the data file	The data file must be allowed to grow enough to handle the changes to the database.
Add enough transaction space for the update	The update requires a large transaction space to convert single byte data to multibyte.
Run the Pre-Update Change Report again	Run the Pre-Update Change Report again to make sure that the appropriate changes were made and the database is ready for the conversion.

Plan Downtime

Please see the Planning the Conversion and Conversion Worksheet for more information.

Backup the Database

Clients should already have a good process for backing up and restoring the database in place. If not, please use the *Blackboard Academic Suite* Operations Workbook and Microsoft's SQL Server documentation to develop and execute a backup and recovery plan. Make sure that a complete backup is done, and the restore tested, before running the Updater.

Change the Recovery Model

Most clients will be using the FULL Recovery Model. This mode creates a full transaction history that would grow to unmanageable size during the update. Follow these steps to check the Recovery Model and change it to SIMPLE.

- 1 Open the **SQL Server Enterprise Manager**.
- 2 Select **Tools>SQL Query Analyzer**.
- 3 Run the following query to check the Recovery Model for each database. Remember to include the *Blackboard Content System* databases if the *Blackboard Content System* is installed. Also, remember to include the databases for any additional licensed Virtual Installations.

```
Select databasepropertyex('bb_bb60', 'recovery');
Select databasepropertyex('BB_BB60_STATS', 'recovery');
Select databasepropertyex('bbadmin', 'recovery');
```

Blackboard Content System databases:

```
Select databasepropertyex('cms', 'recovery');
Select databasepropertyex('cms_files_users', 'recovery');
Select databasepropertyex('cms_files_courses', 'recovery');
Select databasepropertyex('cms_files_orgs', 'recovery');
Select databasepropertyex('cms_files_inst', 'recovery');
Select databasepropertyex('cms_files_library', 'recovery');
```

- 4 If the recovered values are not SIMPLE, run the following command to change the Recovery Model. Again, include the *Blackboard Content System* databases if the *Blackboard Content System* is installed. Also, remember to include the databases for any additional licensed Virtual Installations.

```
Use Master;
go
alter database bb_bb60 set recovery SIMPLE;
alter database BB_BB60_STATS set recovery SIMPLE;
alter database bbadmin set recovery SIMPLE;
go
```

Blackboard Content System databases:

```
Use Master;
go
alter database cms set recovery SIMPLE;
alter database cms_files_users set recovery SIMPLE;
alter database cms_files_courses set recovery SIMPLE;
alter database cms_files_orgs set recovery SIMPLE;
alter database cms_files_inst set recovery SIMPLE;
alter database cms_files_library set recovery SIMPLE;
go
```

- 5 After the Updater has run completely, backup the databases and then change the Recovery Model back to FULL.

Run the Pre-Update Change Report

The Pre-Update Change Report will test the current release to see if it is ready for conversion. The check will verify the database storage space and transaction space.

Confirm Database Storage Space

The Pre-Update Change Report will verify the available disk storage space to ensure it is adequate to support the new database. If the space allotted is not enough, the Pre-Update Change Report will display the amount of space required.

The Pre-Update Change Report outputs `CURRENT_FREE_SPACE` and `REQUIRED_FREE_SPACE`. These values are expressed in bytes and use scientific notation. For example, 6.243E4 is 62430 bytes. Subtract the `CURRENT_FREE_SPACE` from the `REQUIRED_FREE_SPACE` to determine the amount of space needed.

To add space for the database, follow these steps:

- 1 Open **SQL Server Enterprise Manager**.
- 2 Right-click on the database `bb_bb60` and select **Properties**.
- 3 Select **Data Files**.
- 4 Enter the new value in the **Space Allocated (MB)** field.
- 5 Repeat the process for the `BB_BB60_STATS` and `bbadmin` directories. If the *Blackboard Content System* is installed, repeat the process for the CMS database. Also, remember to increase the space allocated to databases for any additional licensed Virtual Installations.

Confirm Database Transaction Space

The Pre-Update Change Report will verify the available transaction log space for each database to ensure it can support both the old and new data in the transaction log. Since the database server needs to keep both old and new data during the update, the conversion requires substantial transaction space. If the space allotted is not enough, the Pre-Update Change Report will display the amount of space required. To add transaction log space, follow these steps:

- 1 Open **SQL Server Enterprise Manager**.
- 2 Right-click on the database `bb_bb60`.
- 3 Select **Transaction Logs**.
- 4 Enter the new value in the **Space Allocated (MB)** field.
- 5 Repeat the process for the `BB_BB60_STATS` and `bbadmin` directories. If the *Blackboard Content System* is installed, repeat the process for the CMS database. Also, remember to increase the transaction space allocated to databases for any additional licensed Virtual Installations.

Run the Pre-Update Change Report Again

Run the Pre-Update Change Report again. Make sure that it reports that the database is ready for updating.

RUN THE RELEASE 6.3 TO RELEASE 7 UPDATER

Overview

Make sure that the database preparation steps have been completed before running the Updater. After the Updater has converted the database it will install the application updates. If the Updater is stopped or fails after the database has been converted the database cannot be returned to its original state. It is critical that a full backup be completed and the restore process confirmed before preparing the database and running the Updater.

Please remember to run the Pre-Update Change Report before running the Updater.



NOTE: The Updater must be run against Release 6.3.1.424 or higher. Please install the latest 6.3 service packs before attempting to update.

Run the Updater on a Load-Balanced System

The Updater must be run on each Web/app server and the Collaboration server on a load-balanced system. The method is similar to the Installer—the Updater is run on each Web/App server in sequential order and then run on the Collaboration server (if the Collaboration server resides on a separate server). After running the Updater the first time, choose the Update an App Server for all other Web/app servers and the Collaboration server. This option will update the application files without making any of the database changes.

When running the Updater on a Windows Load-Balanced environment, run the Updater against the mapped DFS drive, usually L:\blackboard. Do not run the Updater against the actual location, usually C:\Apps\blackboard.

Run the Updater on Windows

Follow these steps to run the Updater on Windows.

- 1 Click on the Updater file to launch it or open a command-line prompt and navigate to the directory that holds the Updater.
- 2 Run the following command to launch the Updater:

```
C:\bb_updater>java -jar <updater_file>
```

To launch the Updater and use the command-line interface, run the following command (the following steps assume that the GUI Updater is used):

```
C:\bb_updater>java -jar <updater_file> -text
```

- 3 A welcome message will appear with a reminder to read the release notes and the installations instructions completely before updating. Click **Next** to continue.
- 4 The first Updater page asks where the /blackboard is found and where the blackboard/content directory is found. Click **Next** to accept the defaults or enter new values and then click **Next**. Load-Balanced users should use the mapped DFS drive, usually L:\blackboard, as the location of the /blackboard directory. If The *Blackboard Academic Suite* is not found in the directory provided, the Updater will attempt to install at the given location.
- 5 The next prompt presents several options. The options are **Update**, **Provide new License file**, **Uninstall Blackboard Academic Suite**, and **Uninstall appserver**. Type **1** and hit **ENTER** to select **Update**.

- 6 A message will appear that displays the changes that will be made when the Updater is run. Hit **ENTER** to start the update. If the Updater was launched from the command line, do not close the command line window or any of the other windows that pop-up during the update.

Troubleshooting the Updater

The Updater logs are an important source of information when troubleshooting issues that arise during an update. The Updater writes the following logs:

```
\blackboard\logs\bb7-installer-log.txt
```

If the installer log file does not identify the problem, the update tool log most likely contains the cause of any installation errors:

```
\blackboard\logs\update-tools\update-tool-log.txt
```

Also check:

```
\blackboard\logs\install\  
\blackboard\logs\install\db-install-errors-log-bb_bb60.txt  
\blackboard\logs\install\db-install-errors-log-bb_bbadmin.txt  
\blackboard\logs\install\db-install-info-log-bb_bb60.txt  
\blackboard\logs\install\db-install-info-log-bb_bbadmin.txt
```

UPDATE WINDOWS FILE SHARING FROM DFS TO UNC

Overview

Release 7 supports UNC mapping to setup a file server to store content files. Since Release 6 supported DFS shares, current Release 6 users must update their file sharing if a separate file server is used to store content files. In particular, clients running on a Windows load-balanced configuration will need to make this change.

UNC mapping is much simpler than DFS and this change will result in a system that is easier to manage and scale. The *Blackboard Academic Suite* now accepts the storage of content files in a separate location than the application files as part of the initial installation.

Another change is the number of shared directories. Release 7 stores all content under the blackboard/content directory. In Release 6, content was split across the blackboard/content directory, the blackboard/docs/vi directory, and, prior to Application Pack 3, the blackboard/server directory. The Updater will copy the contents of the blackboard/docs/vi directory to the contents/vi directory.

Install Service Pack 1 for Windows 2003 After Update

Service Pack 1 for Windows 2003 is required with Release 7. In earlier releases, Service Pack 1 for Windows 2003 was not supported with load-balanced environments because Service Pack 1 is not compatible with DFS. After changing from DFS to UNC, please install Service Pack 1 for Windows 2003.

Change from DFS to UNC

Follow these steps to change the file sharing from DFS to UNC:

- 1 Run the Release 7 Updater on all Web/app servers. Please remember to run the Updater using the mapped DFS drive, usually L:\blackboard, as the location of the /blackboard directory.

- 2 Stop Services on the Web/app servers.

```
L:\blackboard\tools\admin\ServiceController.bat services.stop
```

The next steps disable IIS 5.0 Isolation mode.

- 3 Right click on **My Computer** and select **Manage**.
- 4 Expand **Services and Applications**. Then expand **Internet Information Services**.
- 5 Expand **Web Sites**.
- 6 Right click on **Default Web Site** and select **Stop**.
- 7 Right click on **Web sites** and select **Properties**. The Web Sites Properties window will appear.
- 8 Select the **Service** tab.
- 9 Click **Run WWW service in IIS 5.0 isolation mode**. The box should now be unchecked. This will disable IIS 5.0 Isolation Mode.
- 10 Click **OK**. A prompt will appear to restart IIS so the changes will take effect.
- 11 Edit the L:\blackboard\config\bb-config.properties file. Change the following properties to read as shown:

```
bbconfig.basedir=C:/Apps/blackboard
bbconfig.base.shared.dir=//FILESERVER/bb_content
bbconfig.basedir.win=C:\\Apps\\blackboard
bbconfig.base.shared.dir.win=\\\\FILESERVER\\bb_content
```

If the *Blackboard Content System* is installed, change these values as well:

```
bbconfig.cs.external.data.courses=//FILESERVER/bb_content/storage/courses
bbconfig.cs.external.data.inst=//FILESERVER/bb_content/storage/inst
bbconfig.cs.external.data.library=//FILESERVER/bb_content/storage/library
bbconfig.cs.external.data.orgs=//FILESERVER/bb_content/storage/orgs
bbconfig.cs.external.data.users=//FILESERVER/bb_content/storage/users
```

- 12 Delete the bb_docs_vi DFS link. Open Start > Programs > Administrative Tools > Distributed File System. Open [\\SERVER\Apps](#) and right-click on blackboard\docs\vi and select **Delete Link**.

- 13 Run the PushConfigUpdates.bat tool.

```
L:\blackboard\tools\admin\PushConfigUpdates.bat
```

- 14 This will change the base directory in IIS to point to the new base directory location at C:\Apps\blackboard. Any SSL certificate installed with the original Web site will need to be reinstalled.

The next steps remove the DFS share.

- 15 Log on to the first Web/app server and open Start>Programs>Administrative Tools>Distributed File System.

- 16 Expand the Distributed File System. Right-click [\\SERVER\Apps](#) and select Delete Root.

- 17 Disconnect the L:\ drive.

- 18 Disable the [\\Server\Apps](#) share.

- 19 Edit the C:\WINDOWS\system32\autoexnt.bat file and remove the L:\ drive mapping statement.

```
rem net start "Distributed File System"
rem net start use /DELETE L:
rem net use L: \\FILESERVER\Apps /PERSISTENT:NO /USER: DOMAIN_USER
PASSWORD
```

- 20 Reboot the server and repeat the process for each Web/app server. Once this process is complete, the Web/app servers will use UNC to map to the content directory. The other two directories that were a part of the Distributed File System in Release 6 are no longer needed. The vi directory is moved under the content directory and the system directory is no longer used.

Final notes:

Make sure that the Blackboard services are configured to run as the domain user in bb-config.properties, as follows:

```
bbconfig.appserver.service.account.win=*DOMAIN_USER*
bbconfig.appserver.service.password.win=*PASSWORD*
bbconfig.appserver.service.starttype.win=DEMAND_START
bbconfig.collabserver.service.account.win=*DOMAIN_USER*
bbconfig.collabserver.service.password.win=*PASSWORD*
bbconfig.collabserver.service.starttype.win=DEMAND_START
```

Make sure that the IIS DefaultAppPool identity is the domain user. Set the identity to the domain user under **IIS Manager > Application Pools > DefaultAppPool > Properties > Identity**. The domain user is an account created in the operating system to administer services related to the Blackboard Academic Suite. Please see the Blackboard Academic Suite Setup Guide for more information about creating a domain user.

Blackboard Content System File Shares

In most cases, the *Blackboard Content System* files are stored under the *Blackboard Academic Suite* content directory. If these files were stored on a separate file server and not under the blackboard/content directory, make sure to remove the DFS shares and setup the drive mapping using the same process described above. The locations of the *Blackboard Content System* directories are stored at the bottom of the bbconfig.properties file.

IIS 5.0 COMPATIBILITY MODE NO LONGER SUPPORTED

Overview

Release 6 required that IIS 6.0 run in IIS 5.0 compatibility mode. Release 7 no longer requires IIS 5.0 compatibility mode and must be run as IIS 6.0. After running the Updater, change the IIS compatibility mode before making Release 7 available to users.

The steps below are intended for institutions running on one or two servers. Instructions for disabling IIS Compatibility Mode for load-balanced systems are included as part of the instructions for changing from DFS shares to UNC shares.

Change Compatibility Mode

Follow these steps to disable IIS 5.0 Compatibility Mode.

- 1 Login to the Web/app server as the domain user used to start and stop Blackboard services.
- 2 Right click on **My Computer** and select **Manage**.
- 3 Expand **Services and Applications**. Then expand **Internet Information Services**.
- 4 Expand **Web Sites**.
- 5 Right click on **Default Web Site** and select **Stop**.
- 6 Right click on **Web sites** and select **Properties**. The Web Sites Properties window will appear.
- 7 Select the **Service** tab.
- 8 Click **Run WWW service in IIS 5.0 isolation mode**. The box should now be unchecked. This will disable IIS 5.0 Isolation Mode.
- 9 Click **OK**. A prompt will appear to restart IIS so the changes will take effect.

BLACKBOARD ACADEMIC SUITE (RELEASE 7) UPDATE INSTRUCTIONS FOR UNIX

Overview

The Release 7 Updater has been completely redesigned for easy and reliable updates from Release 7 forward. The Release 7 update requires a database conversion to work with multibyte characters. This conversion will require the process to take more downtime than most updates. Please read through database conversion and Updater instructions carefully before planning and executing the process.



NOTE: The Updater must be run against Release 6.3.1.424 or higher. Please install the latest 6.3 service packs before attempting to update.

Topics

TOPIC	DESCRIPTION
Database Changes from Release 6.3 to Release 7	The Update from Release 6.3 to Release 7 includes a major update to the database to support multibyte characters.
Planning the Conversion	The database conversion requires careful planning and time management.
Best Practices	Ensure that the data on the system is backed up and easy to restore.
Conversion Worksheet	The Conversion Worksheet is a helpful planning tool during the database conversion process.
Pre-Update Change Report	The Pre-Update Change Report details the changes that will be made during the update. It also verifies that the system is ready to accept the update.
Preparing the Database for Update, Oracle	Several steps must be completed to prep the database prior to running the Updater.
Update the Oracle Character Set to AL16UTF16, Blackboard Content System	The <i>Blackboard Content System</i> databases, when running on Oracle, require some additional preparation before running the Updater.
Run the Release 6.3 to Release 7 Updater	Instructions for running the Updater. Be sure to prepare the database before running the Updater.

DATABASE CHANGES FROM RELEASE 6.3 TO RELEASE 7

Overview

The *Blackboard Academic Suite* (Release 7) supports multibyte characters so that users can work in any language and administrators can create Language Packs to support any language. As a result, databases undergo architectural changes to support multibyte characters. These architectural changes make up the database conversion.

Change the Datatype of Database Columns

The Release 7 Updater changes the datatype of any database column that may need to store multibyte characters. Typically, these are columns that store labels, text, and other information entered by the user. The Updater does not change the datatype of any column that does not need to be changed.

Changing only those database columns that may store multi-byte characters ensures that the database growth associated with supporting multi-byte characters is as limited as possible. It is still prudent to expect the Release 7.0 database to require twice as much space as the Release 6.3 database.

Change the National Character Set

Release 7 requires that Microsoft SQL Server use the UCS-2 character set and that Oracle use the AL16UTF16 database for the national character sets. Oracle users must change the national character set from UTF-8 to AL16UTF16 before running the update.

Primary Conversion Formats (Oracle)

- CLOB → NCLOB
- CLOB → BLOB
- CLOB → NVARCHAR2
- VARCHAR2 → NCLOB
- VARCHAR2 → NVARCHAR2

Multibyte Passwords

Release 7 includes support for encrypting multibyte passwords.

File Storage

Multibyte file names may be too long to be handled by the server operating system. The database will store the file name as it is entered by the user. The file name will be converted to work with the operating system and stored on the file server. Within the interface, this will be invisible to users. As an administrator, know that the file names on the file server are may not appear with the same file name that appears to users in the user interface. The file names are read by the database and matched to the file name that the user entered when uploading the file.

Invalid Characters

The Oracle database will be scanned during the update for characters that are not valid in the current database character set. In most cases, the invalid characters are recognized and corrected automatically. Some characters may not be converted correctly. In particular, those few characters in the MacRoman character set that do not have a corresponding value in the Microsoft CP 1252 character set may not be converted exactly. In these cases, the characters will be matched as closely as possible to a valid character. Characters that cannot be matched will appear as question marks in the system following the conversion. Oracle users must change the national character set from UTF-8 to AL16UTF16 before running the update.

PLANNING THE CONVERSION

Sizing the Conversion

The conversion modifies 22 percent of all available columns in the Blackboard schema. Many of these columns store the bulk of the data in the Blackboard schema. It is recommended that clients allocate up to two times the amount of database data and index file storage than the present state of the data before the conversion. The Updater tool will stop if the calculated space expectations noted in the undate-log.txt file are not available. Databases configured for auto-extension must be configured with the appropriate amount of allocated space. The Updater will also require temporary space. Rollback space (Oracle) is not supported by the Updater. Oracle environments must be configured to use UNDO tablespace. Not all of this space will be used, but should be made available. As part of the conversion, the Blackboard Updater performs a database data file size check to ensure accurate storage needs are available prior to executing.



NOTE: Please note that the Updater requires database storage to be allocated before running. Databases configured for auto-extension will need to accommodate fixed available and free storage in advance.

Most of the conversion takes place at the database layer. Some file system changes take place, but for the most part, file system storage needs for the application and file system content will remain consistent. Nonetheless, clients should anticipate a minor change in the size of the file system.

Planning for Operational Downtime

It is important to understand that the conversion process will require operational downtime, or time when the application is unavailable to users. This downtime varies based on how much data is contained within the database and whether the bulk of the data exists in the columns to be converted. The sections below include suggestions for reducing the overall amount of operational downtime. Many of these suggestions involve minimizing the size of the database by removing unnecessary data and/or archiving data using Blackboard's internal tool sets.

Below is a short summary of how much downtime should be expected given the size of database content. The expected down times for the deployment of Microsoft SQL Server and Oracle are provided. The overall size column refers to both Data and Index space. Transaction, rollback or undo space is not included. The estimates in the table below are based on Blackboard internal testing and testing by our Beta partners.

Overall Size	Expected Down time (Windows)	Expected Down Time (UNIX)
Less than 5 GB	Under 1 Hour	Under 1 Hour
5GB to 10GB	Under 2 Hours	Under 5 Hours
10GB to 25GB	Under 10 Hours	Under 15 Hours
25 to 50GB	24 Hours	36 Hours
50 to 150GB	36 to 60 Hours	48 to 72 Hours

The difference in time between a Windows conversion for a Unix conversion is due to extra operations tied to data validation that are built into SQL Server but are required for data integrity on Oracle. Less than 1 percent of all Blackboard deployments are greater than 100GB of database storage. Most deployments (greater than 93 percent based on client sampling) fall in the 5 to 25GB range, subsequently requiring less than a day of operational downtime. Plan for the time above and factor in additional time for system maintenance and testing in accordance with operational best practices at the institution.

Conversion Logging

The database column conversion is logged in multiple locations. The first location is in the blackboard/logs/install directory. The second location is in the bb7-installer-log.txt file. These two log files are useful for administrators to review for troubleshooting and to keep as an archive of the upgrade. The database column conversion is also stored in the database schema. The conversion portion of the Updater is stored in the database in case something happens to the Updater and it does not complete. If the Updater does not complete, review the bb7-installer-log.txt for information on why the Updater did not complete. The Updater is designed so that it can be restarted and will resume from the point where it encountered an error.

Planning for the Unexpected

The Updater has been designed to handle failures and pick-up where it last left off. As an administrator, always plan for the unexpected. The best way to plan for the unexpected is to plan for the conversion.

Develop a Project Plan

Start by developing a project plan tasked out with major milestones and expected dates of execution and completion. Try to factor in some extra time and resources as preventative management.

Create a Back-Up and Recovery Plan

Develop a back-up and recovery plan in case you need to return back to your last working Blackboard configuration. Back-up the database, content, installation files and license files. It is always a good idea to have the installer on-hand if you need to reinstall and restore your content and database files. It is a good idea to practice the back-up and recovery operations on a test server. Practice restoring the back-up of the 6.3 environment before running the conversion (update).

Test the Conversion in Advance

Although the hardware in the development/test environment may be different from the production environment, it is a good idea to practice the conversion as much as possible. Test the conversion more than once to ensure that everything is working as expected. Use this time to estimate how much downtime will be needed when the production system needs to be updated. Blackboard recommends testing the conversion on a copy of the production database.

BEST PRACTICES

Back-Up and Recovery

Creating a back-up is always a recommended best practice before manipulating data. Before running a conversion (test or production), make a full back-up of the database and file system content, and verify that the system can be restored successfully. Successfully going through the back-up and recovery process a few times will assist with capacity planning and unexpected failures for any reason.

Blackboard recommends shutting down or disabling any automated processes so that they do not conflict with the conversion effort.

Archive, Remove, Convert, then Restore

The more data stored in the system, the more conversion time required. This conversion might be an opportunity to clean up the data on the system. There is a good chance that much of the data within the application is unused or outdated.

Work with the appropriate people at your institution to determine a plan that includes archiving data, removing it, and then running the conversion against important data only. After the conversion is successful and before making the system available, restore any relevant archived data while the system is running. As always, before removing the data, verify that a back-up exists.

Purge the Activity Accumulator

The statistics maintained in the `ACTIVITY_ACCUMULATOR` table grows at an astounding rate based on instrumentation programmed by professors into their courses and content items, as well as statically defined within the Blackboard code for key transactional operations. Many Blackboard deployments use the data in this table for reporting purposes. While the data is valuable, it is often perceived as disposable. The conversion of this data can be time consuming and in many cases offers an opportunity to speed up the conversion effort by eliminating it via a delete operation. There are two representations of this table for the *Blackboard Learning System* implementations found in the `BB_BB60` schema and the `BB_BB60_STATS` schema. Both can be deleted using a simple ***truncate table ACTIVITY_ACCUMULATOR*** statement in the database. As always, before you remove the data, verify that a back-up exists. Also, be aware that this will reset the Course Statistics reporting to 0.

High-Performance Conversions

As noted above, some UNIX conversions can take longer than Windows conversions due to a few extra operations that execute behind the scenes. In order to reduce the additional operational downtime that a UNIX client might experience, the Updater includes a special feature to handle parallel conversions of database columns. By default the Updater will invoke two processes to convert individual columns simultaneously. These processes are configurable up to 8. In order to take advantage of parallel processing, an environmental variable (`conversion_thread_count`) must be set in the environmental shell of the UNIX user launching the Updater. The setting is case sensitive. (Ex: `export conversion_thread_count=4`).

Blackboard recommends that this setting be used for larger UNIX installations only as it can have a negative impact on run-time execution on a poorly configured environment. If used, the setting should not exceed the count of processors available on the database server available to the Blackboard Oracle SID. Additionally, this setting should only be used by administrators knowledgeable about configuring a database server and storage environment capable of handling large volumes of synchronous writes. If as an administrator you are not confident that you fit this profile, consider running the conversion without these settings.

The following Oracle initialization parameters below were used in order to support synchronous write performance. The parameters were changed back to their original values after the Updater completed.

```
cpu_count = (Insert the number of logical CPUs available to the Blackboard
Oracle SID)
disk_asynch_io = FALSE
db_writer_processes = (Set this to cpu_count or cpu_count -1)
log_buffer = (Set this to 1 MB or 2 MB)
```

The Oracle changes above can improve the performance of the conversion. However, the greatest performance improvement will come from a high-performance disk sub-system that the Oracle data files reside. Ensure that the disk configuration is capable and optimized to handle synchronous writes.

CONVERSION WORKSHEET

Below is a sample conversion worksheet that steps through the planning, testing and execution process of the 7 upgrade. This is not a comprehensive list, but rather a list of activities that should occur before making the upgraded Blackboard product available to users.

Step	Conversion Task	Owner	Important Dates	Notes/Dependencies
1	Download and read the Release Notes for Upgrading from 6.3 to 7.			
2	Request the Blackboard 7 Updater Binary and License File			
3	Plan for 7 Update			
4	Schedule Operational Downtime for production conversion			
5	Develop a Back-Up and Recovery Plan (if none exists)			
6	Practice Back-Up and Recovery against a test server			
7	Identify data for archival purposes			
8	Back-up production data			
9	Archive and Remove data			
10	Purge Activity Accumulator Data			
11	Run the 7 Updater Reporting Tool (Option #2 of the Updater)			
12	Notify all users and related parties about downtime			
13	Disable access to the application			
14	Disable database back-up processes and automated tasks.			
15	Change the database character set			
16	Add database and/or file system storage if needed			
17	Run the conversion using Option #1 of the Updater.			
18	Follow along with the conversion from the installation console or the log file(s).			
19	After the conversion completes, verify the application starts and all configuration settings remain the same.			
20	Check the log files for any issues.			
21	Check the state of the database and file system to ensure enough storage is available once the system is enabled.			
22	Restore archived data if needed.			
23	Run through any functional or technical tests before deployments.			
24	Verify all automated processes and/or any other administrative operational responsibilities are enabled and working, such as back-ups and maintenance tasks.			
25	Enable Blackboard and notify users.			

PRE-UPDATE CHANGE REPORT

Overview

The Pre-Update Change Report reviews the currently installed system to ensure that it meets the requirements for the update. It then reports its findings and a list of all the file changes that will occur when the Updater is run.

Running the Pre-Update Change Report is an important step before running the Updater.

Run the Pre-Update Change Report, UNIX

Follow these steps to run the Pre-Update Change Report.

- 1 Navigate to the directory that holds the Updater.
- 2 Run the following command to launch the Updater:

```
/usr/local/bbupdater/java -jar <updater_file>
```
- 3 A welcome message will appear with a reminder to read the release notes and the installations instructions completely before updating. Click **Next** to continue.
- 4 The first Updater page asks where the Blackboard Installation Directory is found. Click **Next** to accept the defaults or enter new values and then click **Next**. If The *Blackboard Academic Suite* is not found in the directory provided, the Updater will attempt to install at the given location.
- 5 The next prompt presents several options. The options are **Update**, **Provide new License file**, **Pre-Update Change Report**, **Uninstall Blackboard Academic Suite**, and **Uninstall appserver**. Select **Pre-Update Change Report** and click **Next**.
- 6 The update-report.log file will appear in the Updater directory. This file includes important information on what changes will occur when the Updater is run.

PREPARING THE DATABASE FOR UPDATE, ORACLE

Overview

Clients must prepare the database before running the Updater. The database must use the appropriate character set and have enough available space to handle the larger database.

Preparing an Oracle Database

Complete the following tasks to prepare an Oracle database before updating to Release 7.

STEP	DESCRIPTION
Plan downtime	The update process will require several hours.
Backup the database	Backup the database and test the restore procedure to ensure that the Release 6.3 database can be restored without errors. If the database conversion fails the database may be left in an unusable state. This step is critical!
Change the character set to AL16UTF16	Release 6.3 used the UTF-8 character set, a subset of AL16UTF16 that does not support multibyte characters. Release 7 requires the AL16UTF16 character set.
Disable Archive Log Mode	The Archive Log mode will write a tremendous amount of information during the update. Disabling this log ensures that the update will run as smoothly as possible.
Set BLANK_TRIMMING to TRUE	The BLANK_TRIMMING variable must be set to true to ensure that multiple threads are able to handle large amounts of data during the conversion.
Run the Pre-Update Change Report	Run the Updater and use the Pre-Update Change Report option. This will check the database and report how much disk space and transaction space is required.
Confirm enough disk space for the data file	The data file must be allowed to grow enough to handle the changes to the database.
Confirm enough UNDO space for the update	The update requires a large UNDO space to convert single byte data to multibyte.
Run the Pre-Update Change Report again	Run the Pre-Update Change Report again to make sure that the appropriate changes were made and the database is ready for the conversion.

Plan Downtime

Please see the Planning the Conversion and Conversion Worksheet for more information.

Backup the Database

Clients should already have a good process for backing up and restoring the database in place. If not, please use the *Blackboard Academic Suite* Operations Workbook and the Oracle documentation to develop and execute a backup and recovery plan. Make sure that a complete backup is done, and the restore tested, before running the Updater.

Configure AL16UTF16 Character Set

The Oracle character set must be changed from UTF8 to AL16UTF16 before running the Release 6.3 to Release 7 Updater. Since the *Blackboard Learning System* (Release 6.3) does not have UTF8 data, the national character set can be changed to AL16UTF16 safely with a few SQL commands.



Warning: Clients that are licensing the *Blackboard Content System* must go through some additional steps to protect the *Blackboard Content System* database from corruption during the conversion. Follow the specific instructions for changing the character set when the *Blackboard Content System* is installed.

The default national character set value for Oracle 9i and 10g is AL16UTF16 (also referred to as UTF16). Confirm that the character set is AL16UTF16 before installing the *Blackboard Academic Suite*. The National Character Set value can be determined by querying the v\$ table using the following SQL command:

```
$ sqlplus '/ as sysdba'
SQL> Select parameter, value
  2 from v$nls_parameters
  3 where parameter = 'NLS_NCHAR_CHARACTERSET'
```

PARAMETER	Value
NLS_NCHAR_CHARACTERSET	UTF8

Use these instructions if the *Blackboard Content System* is not licensed. Follow these steps to change the national character set from UTF8 to AL16UTF16.

- 1 Shutdown the database.
- 2 Perform a cold backup (services are turned off) of the database.
- 3 Login as sysdba and execute the following commands.

```
$ sqlplus '/ as sysdba'
SQL> SHUTDOWN IMMEDIATE;
SQL> STARTUP MOUNT EXCLUSIVE;
SQL> ALTER SYSTEM ENABLE RESTRICTED SESSION;
SQL> ALTER SYSTEM SET JOB_QUEUE_PROCESSES=0;
SQL> ALTER SYSTEM SET AQ_TM_PROCESSES=0;
SQL> ALTER DATABASE OPEN;
SQL> ALTER DATABASE NATIONAL CHARACTER SET INTERNAL_USE AL16UTF16;
SQL> SHUTDOWN IMMEDIATE;
SQL> STARTUP;
```

Disable Archive Log Mode

Most clients will be using the Archive Log Mode. This mode creates a full transaction history that would grow to unmanageable size during the update. Follow these steps to disable the Archive Log Mode.

- 1 Open a SQL prompt and run the following query to determine the Archive Log Mode.

```
Select log_mode from v$database;
```
- 2 If the log mode is ARCHIVELOG, run the following commands to change it to NOARCHIVELOG.

```
SHUTDOWN IMMEDIATE;  
STARTUP MOUNT EXCLUSIVE;  
ALTER DATABASE NOARCHIVELOG;  
ALTER DATABASE OPEN;
```
- 3 After the Updater has run completely, backup the databases and then change the mode back to ARCHIVELOG.

Set BLANK_TRIMMING Variable

Add the following command to the oracle.init file:

```
alter system set blank_trimming = TRUE SCOPE=spfile;
```

If the database does not use an SPFILE:

But instead uses an init.ora file, shutdown the database, add the following setting to the init.ora file, and then restart the database:

```
blank_trimming=TRUE
```

Run the Pre-Update Change Report

The Pre-Update Change Report will test the current release to see if it is ready for conversion. The report will verify the database storage space and transaction space.

The Pre-Update Change Report outputs CURRENT_FREE_SPACE and REQUIRED_FREE_SPACE. These values are expressed in bytes and use scientific notation. For example, 6.243E4 is 62430 bytes. Subtract the CURRENT_FREE_SPACE from the REQUIRED_FREE_SPACE to determine the amount of space needed.

Confirm Database Storage Space

The Updater will check the available database data files to ensure they are adequate to support the new database. It will report how much space is need in bytes. Plan for the database to double in size and require another 15 percent increase in size for overhead. If the space allotted is not enough, the Updater will display an alert and quit so that more space can be allocated. Remember to check the size of the following databases and users:

- BB_BB60
- BB_BB60_STATS
- BBADMIN
- All users and databases with the prefix CMS (if the *Blackboard Content System* is installed)

- Any database data files supporting additional licensed Virtual Installations.

To find all available Oracle tablespaces and associated data files, run the following command in SQL*PLUS:

```
Select tablespace_name, file_name from dba_data_files;
```

To add space or data files, follow the steps below. Blackboard recommends that files be uniform in size and 2GB to 8GB allocations.

- 1 Log in to Oracle as sys user.
- 2 Using SQL*Plus, execute the following command:

```
alter database datafile '/path_to_file/filename' resize Xm;
```

where X is the new size of the data file in MB.

Follow these steps to add a data file to the tablespace:

- 1 Log in to Oracle as sys user.
- 2 Using SQL*Plus, execute the following command:

```
alter tablespace TS_NAME add datafile '/path_to_file/filename' size Xm;
```

where X is the new size of the data file in MB.

Remember to add sufficient space for all of the database datafiles associated with the *Blackboard Academic Suite*.

Confirm Database Transaction Space

The database needs to keep both old and new data in the archive log. Since the database server needs to keep both old and new data during the update, the UNDO tablespace should be about three times the largest amount of data in the any column that will be converted to Unicode plus 15 percent overhead. Do not use rollback segments. If the space allotted is not enough, the Updater will quit and display an alert asking for more transaction space.

- 1 Run the following query to determine the amount of space in the UNDO tablespace.

```
Select sum(b.bytes) from dba_tablespaces a join dba_data_files b using
(tablespace_name) where contents='UNDO';
```

- 2 Find the name of the data files that belong to the UNDO tablespace by running the following query.

```
Select tablespace_name, b.file_name from dba_tablespaces a join
dba_data_files b using (tablespace_name) where contents='UNDO';
```

- 3 If an UNDO tablespace does not exist, execute the following commands to create one. The example below shows a data file that can grow to 200MB. Consider raising this value if the Release 6.3 database is particularly large. Remember, if this is not enough space the Updater will quit to allow you to add more space as needed.

```
Create UNDO TABLESPACE undotbs_01 DATAFILE '/path_to_file/filename' SIZE
200M REUSE AUTOEXTEND ON;
```

- 4 Run the following command to resize the data file where /path_to_file/ filename is the name of the data file including the path as return by the query above, and X is the required size in MBs.

```
alter database datafile '/path_to_file/filename' resize Xm;
```

- 5 Finally, take all rollback segments offline and drop them, where *RS_NAME* is the name of the rollback segment.

```
Alter rollback segment RS_NAME offline;
Drop public rollback segment RS_NAME;
--repeat of each rollback segment
alter system set undo_management = auto scope=spfile;
alter system set undo_tablespace = undotbs_01 scope=both;
```

If you use pfile instead of spfile, add the following parameters to the pfile.

```
undo_management = auto  
undo_tablespace = undotbs_01
```

Run the Pre-Update Change Report Again

Run the Pre-Update Change Report again. Make sure that it reports that the database is ready for updating.

UPDATE THE ORACLE CHARACTER SET TO AL16UTF16, *BLACKBOARD CONTENT SYSTEM*

Overview

The Oracle character set must be changed from UTF8 to AL16UTF16 before running the Release 6.3 to Release 7 Updater.



Warning: Clients that are licensing the *Blackboard Content System* must go through some additional steps to protect the *Blackboard Content System* database from corruption during the conversion. Follow the specific instructions for changing the character set when the *Blackboard Content System* is installed.

Confirm AL16UTF16 Character Set

The default national character set value for Oracle 9i and 10g is AL16UTF16 (also referred to as UTF16). Administrators using Oracle should confirm that the character set is AL16UTF16 before installing the *Blackboard Academic Suite*. The National Character Set value can be determined by querying the v\$ table using the following SQL command:

```
$ sqlplus '/' as sysdba'
SQL> Select parameter, value
  2  from v$nls_parameters
  3  where parameter = 'NLS_NCHAR_CHARACTERSET'
```

PARAMETER	Value
NLS_NCHAR_CHARACTERSET	UTF8

Changing the Character Set (Including the *Blackboard Content System*)

Before updating the Character Set the *Blackboard Content System* data must be exported and then imported after changing the National Character Set.

Follow these steps to change the National Character Set when the *Blackboard Content System* is installed.

- 1 Stop the database and restart it in restricted mode.

```
# sqlplus "/ as sysdba"
SQL*Plus: Release x.x.x.x - Production on XX XXX XX XX:XX:XX XXXX
Copyright © 1982, XXXX, Oracle Corporation. All rights reserved.
Connected to an idle instance.
```

```
SQL> startup restrict
ORACLE instance started.
```

```
Total System Global Area          XXXXXXXXXXX bytes
Fixed Size                          XXXXXXXXXXX bytes
Variable Size                       XXXXXXXXXXX bytes
Database Buffers                    XXXXXXXXXXX bytes
Redo Buffers                         XXXXXXXXXXX bytes
```

```
Database mounted.  
Database opened.  
SQL>
```

The startup restrict command will prevent most users from logging into the database server.

- 2 Run the following commands. These commands are necessary to ensure that the scripts do not include any non-SQL statements.

```
SQL> set echo off  
SQL> set feedback off  
SQL> set heading off  
SQL> set linesize 200
```

- 3 Create a script to recreate the existing *Blackboard Content System* tablespaces.

```
SQL> spool recreate_tablespaces.sql  
SQL> select 'create tablespace ' || tablespace_name || ' datafile extent  
management local segment space management auto;' from dba_tablespaces  
where tablespace_name like 'CMS%';  
SQL> spool off
```

- 4 Create a script to recreate existing *Blackboard Content System* database users.

```
SQL> spool recreate_users.sql  
SQL> select 'create user ' || username || ' identified by values ''' ||  
password || ''' default tablespace ' || default_tablespace || ' temporary  
tablespace ' || temporary_tablespace || ' quota unlimited on ' ||  
default_tablespace || ',' from dba_users  
where username like 'CMS%';  
SQL> spool off
```

- 5 Create a script to grant the existing roles to the *Blackboard Content System* database users.

```
SQL> spool regrant_role_privs.sql  
SQL> select 'grant ' || granted_role || ' to ' || grantee || ',' from  
dba_role_privs where grantee in (select username from dba_users  
where username like 'CMS%');  
SQL> spool off
```

- 6 Create a script to grant the existing system privileges to the *Blackboard Content System* database users.

```
SQL> spool regrant_sys_privs.sql  
SQL> select 'grant ' || privilege || ' to ' || grantee || ',' from  
dba_sys_privs where grantee in (select username from dba_users  
where username like 'CMS%');  
SQL> spool off
```

- 7 Create a script to drop the users.

```
SQL> spool drop_users.sql  
SQL> select 'drop user ' || username || ' cascade;' from dba_users  
where username like 'CMS%';  
SQL> spool off
```

- 8 Create a script to drop the tablespaces.

```
SQL> spool drop_tablespaces.sql  
SQL> select 'drop tablespace ' || tablespace_name || ' including  
contents;' from dba_tablespaces where tablespace_name like 'CMS%';  
SQL> spool off
```

- 9 After creating all the scripts, the SQL> spool lines must be removed from the script files. Open each script file in an editor and remove the lines in the file that begin with SQL>.

For example:

```
SQL> spool drop_tablespaces.sql
SQL> select 'drop tablespace ' || tablespace_name || ' including
contents;' from dba_tablespaces where tablespace_name like 'CMS%';
drop tablespace cms_data including contents;
drop tablespace cms_indx including contents;
...
SQL> spool off
```

- 10 Run the following commands again (this is a repeat of Step 2). These commands are necessary to ensure that the scripts do not include any non-SQL statements.

```
SQL> set echo off
SQL> set feedback off
SQL> set heading off
SQL> set linesize 200
```

- 11 To export the data use the Oracle exp command. Use the system account to connect to the database. This is the only account that will be able to connect to the database since it is running in restricted mode.

If the database is less than or equal to 2 GB in size, use the command below to export the data:

```
# exp system/password file=blackboard_data.dmp log=blackboard_data.log
owner=(CMS, CMS_FILES_ORGS, CMS_FILES_LIBRARY, CMS_FILES_COURSES,
CMS_FILES_INST, CMS_FILES_USERS) buffer=1000000
```

If the database is greater than 2 GB in size, divide the size of the database by two to determine the number of database export files that will be needed to store the data. For example, if the database is 6 GB, then three export files would be required. Use the command below to export the data, specifying the filenames that will be used for data storage:

```
# exp system/password file=(blackboard_data1.dmp, blackboard_data2.dmp,
...) filesize=2G log=blackboard_data.log owner=(user1 CMS,
CMS_FILES_ORGS, CMS_FILES_LIBRARY, CMS_FILES_COURSES, CMS_FILES_INST,
CMS_FILES_USERS) buffer=1000000
```

If enough filenames to store all of the data are not specified, Oracle will prompt for additional file names. The `filesize` option for the Oracle `exp` command is available in Oracle versions 8.1.5 and greater.

- 12 Execute the drop.

```
SQL> @drop_users.sql
SQL> @drop_tablespaces.sql
```

- 13 Change the national character set. Login to SQL*PLUS as sysdba and execute the following commands.

```
$ sqlplus '/ as sysdba'
SQL> SHUTDOWN IMMEDIATE;
SQL> STARTUP MOUNT EXCLUSIVE;
SQL> ALTER SYSTEM ENABLE RESTRICTED SESSION;
SQL> ALTER SYSTEM SET JOB_QUEUE_PROCESSES=0;
SQL> ALTER SYSTEM SET AQ_TM_PROCESSES=0;
SQL> ALTER DATABASE OPEN;
SQL> ALTER DATABASE NATIONAL CHARACTER SET INTERNAL_USE AL16UTF16;
SQL> select value from nls_database_parameters where
parameter='NLS_NCHAR_CHARACTERSET';
```

VALUE

AL16UTF16

- 14 The Oracle import utility will attempt to import data into the same tablespaces from which they were exported. Before the data can be imported, the `tablespaces` have to be created. Previously a spool file with the create tablespace statement for each of the tablespaces that existed in the Oracle 9i database was created. This file was saved as `recreate_tablespaces.sql`.

Before the tablespaces can be created, `db_create_file_dest` parameter must be set. This parameter tells Oracle where to create the data files. If you want to put the data files under `/usr/local/oracle/bbdata` directory, log into Oracle as `sysdba` and execute the following command.

```
# sqlplus "/ as sysdba"
SQL> alter system set
db_create_file_dest='/usr/local/oracle/bbdata' scope=both;
SQL> exit
```

- 15 Create tablespaces. The database must be running.

```
# sqlplus "/ as sysdba"
SQL*Plus: Release XX.X.X.X - Production on XX XXX XX XX:XX:XX XXXX
Copyright © 1982, 2004, Oracle Corporation. All rights reserved.
SQL> @recreate_tablespaces.sql
```

- 16 After the tablespaces are created, all previous Blackboard Oracle users can be recreated by using the script created in the previous step (Step 1).

```
SQL> @recreate_users.sql
```

Grant previous users them the same privileges that they had before the conversion.

```
SQL> @regrant_role_privs.sql
SQL> @regrant_sys_privs.sql
```

- 17 Use the Oracle import utility to import the previously created dump file `blackboard_data.dmp` into the database.

Must be run from the command line as Oracle:

```
$ imp system/password file = blackboard_data.dmp full=y buffer=2000000
```

After the data is imported into the database, the conversion of Oracle is complete. A cold backup should be taken of the new database installation.

RUN THE RELEASE 6.3 TO RELEASE 7 UPDATER

Overview

Make sure that the database preparation steps have been completed before running the Updater. After the Updater has converted the database it will install the application updates. If the Updater is stopped or fails after the database has been converted the database cannot be returned to its original state. It is critical that a full backup be completed and the restore process confirmed before preparing the database and running the Updater.

Please remember to run the Pre-Update Change Report before running the Updater.



NOTE: The Updater must be run against Release 6.3.1.424 or higher. Please install the latest 6.3 service packs before attempting to update.

Run the Updater on a Load-Balanced System

The Updater must be run on each Web/app server and the Collaboration server on a load-balanced system. The method is similar to the Installer—the Updater is run on each Web/App server in sequential order and then run on the Collaboration server (if the Collaboration server resides on a separate server). After running the Updater the first time, choose the Update an App Server for all other Web/app servers and the Collaboration server. This option will update the application files without making any of the database changes.

Run the Updater on UNIX

Follow these steps to run the Updater on UNIX.

- 1 Before running the Updater, open the `bb-config.properties` file and check the `bbconfig.smtpserver.hostname` value. A valid SMTP server must appear for the Updater to run correctly.
- 2 Open a command-line prompt and navigate to the directory that holds the Updater.
- 3 Run the following command to launch the Updater:

```
/usr/local/bbupdater/java -jar <updater_file>
```

If Xwindows or a similar GUI is running and the `DISPLAY` variable is properly configured, the Updater will launch in GUI mode (remember that the following steps assume that the command line Updater is used)

A welcome message will appear with a reminder to read the release notes and the installations instructions completely before updating. Hit **ENTER** to continue.

- 4 Instructions will appear for navigating through the Updater prompts. The Updater, in most cases, will provide a default value in brackets. Hit **ENTER** to accept the default and continue or enter a different value. Hit **ENTER** to continue after entering a new value.
- 5 The first Updater prompt asks for the directory where Blackboard will be found. Hit **ENTER** to accept the default or enter a new value and then hit **ENTER**. If The *Blackboard Academic Suite* is not found in the directory provided, the Updater will attempt to install at the given location.
- 6 The next prompt presents several options. The options are **Update**, **Provide new License file**, **Uninstall Blackboard Academic Suite**, and **Uninstall appserver**. Type **1** and hit **ENTER** to select **Update**.

- 7 A message will appear that displays the changes that will be made when the Updater is run. Hit **ENTER** to start the update. Do not close the command line window or any of the other windows that pop-up during the update.
- 8 After running the update, stop the Blackboard services and then stop the shutdown the Oracle database. Restart in the reverse order. Start the Oracle database first and then start the Blackboard services. Shutting down and restarting the Blackboard services and the Oracle database will prevent any potential problems with database caching after running the update.
- 9 After the Updater has finished, backup the databases and then change the mode back to ARCHIVELOG.

Troubleshooting the Updater

The Updater logs are an important source of information when troubleshooting issues that arise during an update. The Updater writes the following logs:

```
/blackboard/logs/bb7-installer-log.txt
```

If the installer log file does not identify the problem, the update tool log most likely contains the cause of any installation errors:

```
/blackboard/logs/update-tools/update-tool-log.txt
```

Also check:

```
/blackboard/logs/install/  
/blackboard/logs/install/db-install-errors-log-bb_bb60.txt  
/blackboard/logs/install/db-install-errors-log-bb_bbadmin.txt  
/blackboard/logs/install/db-install-info-log-bb_bb60.txt  
/blackboard/logs/install/db-install-info-log-bb_bbadmin.txt
```

Some testers reported that the Updater failed with the following errors:

ORA-01401: inserted value too large for column exception.

The error occurs when an attempting to change a column format to support multibyte characters. The issue is not related to the data in the column. Rather, the issue is caused by an incompatibility in the Dictionary space on systems that have been restored by replacing datafiles and control files.

To resolve the issue, attempt to run the Updater again. If the issue persists, repeat the steps for changing the character set to AL16UTF16.

EXP-00056: ORACLE error 904

This error appears in the export log when exporting, converting, and importing the Content System databases. This error only occurs if the CATEXP.sql file is not run during initial database setup, particularly when migrating to Oracle 9.2.0.7. To resolve the issue, start the database in migration mode and run the CATEXP.sql file from the `$ORACLE_HOME/rdbms/admin` directory.

UPDATE ECOMMERCE

Installation Process

The Enviserv or Optiserv middleware must be updated along with the Blackboard Community System if the eCommerce features are enabled. Enviserv and Optiserv are additional software that allow communication between the Blackboard Transaction System and the Blackboard Community System. Updating the Enviserv or Optiserv software requires the uninstallation of the old version and installation of the new version. Before doing so, make a backup of the existing installation so the system can be restored to its current state.

The process for connecting the Community System to the Transaction System depends upon the licensed version of the Transaction System. Use the table below to determine which process to follow:

TRANSACTION SYSTEM VERSION	PLEASE SEE . . .
Blackboard Transaction System—Universal Edition	Install Enviserv
Blackboard Transaction System—Windows Edition	Install Enviserv
Blackboard Transaction System—UNIX Edition	Install Optiserv on a UNIX Server (if the Blackboard Community System is running on a UNIX server)
	Install Optiserv on a Windows Server (if the Blackboard Community System is running on a Windows server)

e-Commerce Prerequisites

The following prerequisites must be met before connecting the Blackboard Community System to the Blackboard Transaction System.

- Blackboard Transaction System—Universal Edition; Blackboard Transaction System—Windows Edition, package 212 or higher; or Blackboard Transaction System—Unix Edition, Release 9.0 or higher.
- Blackboard Community System Release 7.0 or higher.
- SSL-Enabled on the Blackboard Community System.
- The version of Enviserv or Optiserv that matches the version of the Blackboard Community System. For example, if the Blackboard Community System is build 7.0.298, use Enviserv 7.0.298 or Optiserv 7.0.298.
- Installing Optiserv on the Blackboard Transaction System—UNIX Edition also requires a dedicated Lantronix device to enable communication via IP.

NOTE: For SSL to work with the MyAccounts module it must be enabled for all parts of the Blackboard Academic Suite. If SSL Choice is used, the MyAccounts module will not be secured under SSL. Also, it is not possible to make purchases in the eMarketplace without an SSL certificate.

Information on installing the Blackboard Academic Suite can be found in the Blackboard Academic Suite Setup Guide. Information on configuring SSL can be found in the Server Administration Guide. Please consult the Blackboard Transaction System documentation for information on installing the Blackboard Transaction System.

ENVI SERV INSTALLATION

The EnviServ server enables communication between the Blackboard Community System and the Blackboard Transaction System—Universal Edition or the Blackboard Transaction System—Windows Edition. The EnviServ middleware is installed on the Blackboard Transaction System server. Instructions for installing EnviServ appear below.

NOTE: The EnviServ version must match the version of the Blackboard Community System.

Enviserv Settings

The following settings are required when installing Enviserv. Gather the values for each setting before running the installer. This data can be found in the properties file: `C:\enviserv\blackboard\config\bb-config.properties`

SETTING	VALUE
Enviserv Directory	The directory where Enviserv will be installed. The default value is C:\Enviserv
J2SE Directory	The location of the Java 2 Platform, Standard Edition. Make sure that the full SDK is available on the server and matches the version required for the Blackboard Community System.
Enviserv Server Configuration	
Host Name	Enter the IP Address or DNS name for the server hosting Enviserv.
Port	Enter the port number that Enviserv will use to listen for requests from the Blackboard Community System. The default is Port 3784 (The port must match transaction system settings configuration of the Community System.)
Secret Key	The Key must be 16 characters long and can be any combination of alphanumeric characters. The same key will later be entered into the Blackboard Community System.
Windows Service Name	Enviserv runs as Bb-Enviserv within the Windows operating system.
Transaction System Configuration	
Host Name	Enter the IP Address or DNS name for the server hosting the Transaction System Database.
Port	1521
SID	Enter the Database SID used with Transaction System Database.
User	Enter the user name as envision.
Password	Enter a password for the user.

Install Enviserv on a Windows Server

Follow these steps to install the EnviServ server software.

1. Stop Enviserv.

```
C:\enviserv\blackboard\tools\admin\ServiceController.bat services.stop
```

2. Remove the NT service.

```
C:\enviserv\blackboard\tools\admin\RemoveServices.bat
```

3. Rename the C:\enviserv directory to C:\enviserv.orig.

4. Download bb_enviserv_windows_X_X_X_XXX.exe (Where the X's are the version number) to the Blackboard Transaction System server. Make sure that the Enviserv version number matches the version number of the Blackboard Community System.

5. Run the installer.

6. Confirm the license agreement and click **Next**.

7. Complete the fields in the installer using **Next** and **Back** to navigate between pages. Descriptions of the data that must be provided are included above in the Enviserv Settings table.

8. Click **Finish** after completing the installer.

9. Once the installation is finished, start the Bb-Enviserv service through the Windows operating system.

10. After installation is complete and the Bb-Enviserv service is running, test the system.

11. After verifying that Enviserv is operating properly, remove the C:\Enviserv.orig backup directory.

Enviserv Config File and Command Line Tools

After installing Enviserv, the properties file that stores user-defined settings is stored at:

```
C:\enviserv\blackboard\config\bb-config.properties
```

This file is useful when making updates to Enviserv. Keep a backup copy to easily reapply settings after an update. Keep in mind that the Enviserv version must be kept consistent with the Blackboard Community System version. Update Enviserv every time the Blackboard Community System is updated.

To start and stop Enviserv services, use the following tool:

```
C:\enviserv\blackboard\tools\admin\ServiceController.bat
```

To start services:

```
C:\enviserv\blackboard\tools\admin\ServiceController.bat services.start
```

To stop services:

```
C:\enviserv\blackboard\tools\admin\ServiceController.bat services.stop
```

As part of the uninstallation process, the service must be removed from the server. Use the following tool to remove the NT service:

```
C:\enviserv\blackboard\tools\admin\RemoveServices.bat
```

OPTISERV INSTALLATION FOR UNIX

The OptiServ middleware enables communication between the Blackboard Community System and the Blackboard Transaction System—UNIX Edition. The OptiServ middleware is installed on the Blackboard Community System Web/application server. Instructions for installing OptiServ on both Windows and UNIX operating systems are below.

NOTE: The OptiServ version must match the version of the Blackboard Community System.

Optiserv Settings

The following settings are required when installing Optiserv. Gather the values for each setting before running the installer. This data can be found in the properties file: `/usr/local/Optiserv/blackboard/config/bb-config.properties`

SETTING	VALUE
Optiserv Directory	The directory where Optiserv will be installed. The default value is <code>/usr/local/Optiserv</code>
J2SE Directory	The location of the Java 2 Platform, Standard Edition. Make sure that the full SDK is available on the server and matches the version required for the Blackboard Community System.
Optiserv Server Configuration	
Host Name	Enter the IP Address or DNS name for the server hosting Optiserv.
Port	Enter the port number that Optiserv will use to listen for requests from the Blackboard Community System. (This value must match port number that will be configured in the Optiserv settings section of Transaction system settings on the Community System, normally 6784.)
Secret Key	The Key must be 16 characters long and can be any combination of alphanumeric characters. The same key will later be entered into the Blackboard Community System.
Lantronix Server Configuration	
Host Name	The IP Address of the Lantronix Server.
Port	3001 (This value must be 3001).
Key	32 bit hexadecimal encryption key. (Must match 32 bit hex key configured on the Lantronix server.)
Tender Configuration	
Flag	00
Number	Tender number configured on the Transaction system for purchases.
Category	02

SETTING	VALUE
Privilege/Reader Configuration	
Privilege	Privilege number configured on the Transaction System for purchases (The tender number defined above points to this privilege).
Reader	Address of reader as defined in the Transaction System.

Install Optiserv on a UNIX Server

If the Blackboard Community System is running on a UNIX operating system, Follow these steps to install the OptiServ server software.

1. Stop Optiserv.

```
/usr/local/Optiserv/blackboard/tools/admin/ServiceController.sh
services.stop
```

2. Rename the `/usr/local/Optiserv` directory to `/usr/local/Optiserv.orig`.
3. Download the Optiserv installer to the Blackboard Community System Web/application server. Make sure that the .bin file includes the same version number as the Blackboard Community System (it should also match the operating system). For example, `bb_optiserv_linux_X_X_XXX_X.bin` (where `X_X_XXX_X` represents the version number).
4. Launch the installer.
5. Follow the on screen prompts to enter the information that the installer needs to complete. All of the values that must be provided are listed above in the Optiserv Settings table.
6. Enter the Destination Location. Use `/usr/local/optiserv` as the location.
7. Enter the Lantronix server IP, Port, and Key.
8. Enter the Blackboard Transaction System Tender information.
9. Enter the Privilege/Reader configuration.
10. Once the installation is finished, start the OptiServ service and test the system. After validation, remove the backup directory `/usr/local/Optiserv.orig`.

Optiserv Config File and Command Line Tools

After installing Optiserv, the properties file that stores user-defined settings is stored at:

```
/usr/local/Optiserv/blackboard/config/bb-config.properties
```

This file is useful when making updates to Optiserv. Keep a backup copy to easily reapply settings after an update. Keep in mind that the Optiserv version must be kept consistent with the Blackboard Community System version. Update Optiserv every time the Blackboard Community System is updated.

To start and stop Optiserv services, use the following tool:

```
/usr/local/Optiserv/blackboard/tools/admin/ServiceController.sh
```

To start services:

```
/usr/local/Optiserv/blackboard/tools/admin/ServiceController.sh services.start
```

To stop services:

```
/usr/local/Optiserv/blackboard/tools/admin/ServiceController.sh services.stop
```

OPTISERV INSTALLATION FOR WINDOWS

The OptiServ middleware enables communication between the Blackboard Community System and the Blackboard Transaction System—UNIX Edition. The OptiServ middleware is installed on the Blackboard Community System Web/application server. Instructions for installing OptiServ on Windows operating systems are below.

NOTE: The OptiServ version must match the version of the Blackboard Community System.

Optiserv Settings

The following settings are required when installing Optiserv. Gather the values for each setting before running the installer. This data can be found in the properties file: `C:\optiserv\blackboard\config\bb-config.properties`

SETTING	VALUE
Optiserv Directory	The directory where Optiserv will be installed. The default value is C:\Optiserv
J2SE Directory	The location of the Java 2 Platform, Standard Edition. Make sure that the full SDK is available on the server and matches the version required for the Blackboard Community System.
Optiserv Server Configuration	
Host Name	Enter the IP Address or DNS name for the server hosting Optiserv.
Port	Enter the port number that Optiserv will use to listen for requests from the Blackboard Community System. (This value must match port number that will be configured in the Optiserv settings section of Transaction system settings on the Community System, normally 6784.)
Secret Key	The Key must be 16 characters long and can be any combination of alphanumeric characters. The same key will later be entered into the Blackboard Community System.
Lantronix Server Configuration	
Host Name	The IP Address of the Lantronix Server.
Port	3001 (This value must be 3001).
Key	32 bit hexadecimal encryption key. (Must match 32 bit hex key configured on the Lantronix server.)
Tender Configuration	
Flag	00
Number	Tender number configured on the Transaction system for purchases.
Category	02

SETTING	VALUE
Privilege/Reader Configuration	
Privilege	Privilege number configured on the Transaction System for purchases (The tender number defined above points to this privilege).
Reader	Address of reader as defined in the Transaction System.

Install Optiserv on a Windows Server

If the Blackboard Community System is running on a Windows operating system, follow these steps to install the OptiServ middleware.

1. Stop Optiserv.

```
C:\Optiserv\blackboard\tools\admin\ServiceController.sh services.stop
```

2. Remove the NT service.

```
C:\optiserv\blackboard\tools\admin\RemoveServices.bat
```

- 3.

4. Rename the `C:\Optiserv` directory to `C:\Optiserv.orig`.

5. Download the Optiserv installer to the Blackboard Community System Web/application server. The Optiserv installer should be named `bb_optiserv_windows_X_X_XXX_X.exe` where `X_X_XXX_X` is the version number. Make sure that the version number of the Optiserv installer matches the version number of the Blackboard Community System.

6. Launch the installer.

7. Follow the on screen prompts to enter the information that the installer needs to complete. All of the values that must be provided are listed above in the Optiserv Settings table.

8. Enter the Destination Location. Use `C:\optiserv` as the location.

9. Enter the Lantronix server IP, Port, and Key.

10. Enter the Blackboard Transaction System Tender information.

11. Enter the Privilege/Reader configuration.

12. Once the installation is finished, start the OptiServ service and test the system. After validation, remove the backup directory `C:\Optiserv.orig`.

Optiserv Config File and Command Line Tools

After installing Optiserv, the properties file that stores user-defined settings is stored at:

```
C:\Optiserv\blackboard\config\bb-config.properties
```

This file is useful when making updates to Optiserv. Keep a backup copy to easily reapply settings after an update. Keep in mind that the Optiserv version must be kept consistent with the Blackboard Community System version. Update Optiserv every time the Blackboard Community System is updated.

To start and stop Optiserv services, use the following tool:

```
C:\Optiserv\blackboard\tools\admin\ServiceController.bat
```

To start services:

```
C:\Optiserv\blackboard\tools\admin\ServiceController.bat services.start
```

To stop services:

```
C:\Optipserv\blackboard\tools\admin\ServiceController.bat services.stop
```

REFERENCE MATERIALS

About Reference Materials

A full suite of reference materials is available with the Academic Suite. All materials are located in the Reference Center at <http://behind.blackboard.com>. These materials include:

MANUAL NAME	DESCRIPTION
Blackboard Academic Suite Hardware/Software Guide	
Hardware Sizing Guide	Helps Administrators plan their hardware needs for running the <i>Blackboard Academic Suite</i> .
Blackboard Academic Suite Installation Guide	
Setup Guide	Installing the <i>Blackboard Academic Suite</i> .
Blackboard Academic Suite Administrator Guides and Manuals	
System Administrator Manual	Reference manual detailing the tools and functions available through the Administrator Panel. This manual covers the entire <i>Blackboard Academic Suite</i> .
Server Administrator	Background information, specific instructions, and resources covering different types of end-user authentication, application architecture, Virtual Installations, and SSL.
Advanced Integration and Data Management Manual	Background information on integration and instructions for using integration tools included in the <i>Blackboard Academic Suite</i> .
Blackboard Academic Suite API Specifications and Building Blocks	
Introduction to the Building Blocks APIs and Runtime	Reference material about the Building Block APIs and Runtime for developers creating Building Blocks.
System Extension Developers Guide	An overview of the Building Block framework and a quick start reference to begin creating Building Blocks.
Module Developers Guide	A quick start reference to create Building Block modules.
Building Block API Specifications	The Building Block API JavaDoc; this serves as the authoritative reference for developers creating Building Blocks for the <i>Blackboard Learning System</i> and the <i>Blackboard Community System</i> .
Administrative API Specifications	The Snapshot API JavaDoc; this serves as the authoritative reference for

MANUAL NAME	DESCRIPTION
	Administrators using the snapshot tool.
Blackboard Academic Suite End User Manuals	
User Manual	Reference manual detailing the tools and functions included in the platform from the general user perspective. This manual includes information on the <i>Blackboard Learning System</i> and the <i>Blackboard Community System</i> .
Instructor Manual	Reference manual providing detailed information about building and managing courses and organizations. This manual includes information on the <i>Blackboard Learning System</i> and the <i>Blackboard Community System</i> .
Blackboard Content System API Specifications and Building Blocks	
Blackboard Content System Building Blocks API Specifications	The Building Block API JavaDoc for the <i>Blackboard Content System</i> ; this serves as the authoritative reference for developers creating Building Blocks for the <i>Blackboard Content System</i> .
Blackboard Content System End User Manuals	
User Manual	Reference manual detailing the tools and functions included in the system for all end users. This manual includes information on the <i>Blackboard Content System</i> .