



Blackboard

Blackboard Academic Suite™

Release Notes

Application Pack 1 (Release 7.1)
Updated for Service Pack 1
Blackboard Learning System™
Blackboard Community System™
Blackboard Learning System - Basic Edition
Blackboard Content System™

Release Notes (171020en_US)

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WORLDWIDE HEADQUARTERS	INTERNATIONAL HEADQUARTERS
Blackboard Inc.	Blackboard International B.V.
1899 L Street, NW, 5th Floor Washington, DC 20036-3861 USA	Keizersgracht 62/64 1015 CS Amsterdam The Netherlands
800-424-9299 toll free US & Canada	
+1-202-463-4860 telephone	+31 20 5206884 (NL) telephone
+1-202-463-4863 facsimile	+31 20 5206885 (NL) facsimile
www.blackboard.com	global.blackboard.com

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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. It also includes changes to existing functionality that may impact the way the system is currently used.

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 Application Pack 1 (Release 7.1) introduces a number of new features and enhancements to the existing features in response to user feedback.

This section reviews the new features in Application Pack 1 (Release 7.1), explains their default availability upon installation, and specifies Blackboard license requirements.

New features and enhancements fall into the following categories:

- [Service Pack 1 Updates](#)
- [Discussion Board](#)
- [Domain Management](#)
- [Flexible Roles and Privileges](#)
- [Course and Organization Catalogs by Role](#)
- [Visual Text Box Editor](#)
- [Assessments and Gradebook](#)
- [SIF \(Schools Interoperability Framework\)](#)
- [Blackboard Academic Suite](#) Changes including the *Blackboard Learning System*, the *Blackboard Community System* and the *Blackboard Content System*

SERVICE PACK 1 UPDATES

Oracle 10g (Release 2) Compatibility

Service Pack 1 for Application 1 of the Blackboard Academic Suite (Release 7) includes limited support for Oracle 10g (Release 2). As a compatible configuration it has undergone limited testing and is not fully supported.

Prior to Oracle 10g (Release 2), the `CONNECT` role was granted eight privileges: `create session`, `create table`, `create view`, `create synonym`, `create database link`, `create cluster`, `create sequence`, and `alter session`. With the release of Oracle 10.2.0.1, only the `create session` privilege is granted to the `CONNECT` role. Oracle removed the additional `CONNECT` role privileges in Oracle 10g (Release 2) to provide additional security by enforcing a principle of least privileges.

The Blackboard installer requires the `CONNECT` role to have both the `create session` and `create table` privileges.

The following will grant the two privileges that are required to install Blackboard on Oracle 10g (Release 2):

```
sqlplus "/as sysdba"  
SQL> @$ORACLE_HOME/rdbms/admin/rstrconn.sql  
SQL> GRANT create session, create table TO CONNECT;  
SQL> commit;  
SQL> exit
```

Another minor issue that occurs with Oracle 10g (Release 2) is that the databases and listener will not startup correctly when running the `dbstart` and `dbshut` oracle scripts to startup and shutdown the databases. To fix the problem follow these steps:

Linux:

1. `su - oracle`
2. `vi $ORACLE_HOME/bin/dbstart & vi $ORACLE_HOME/bin/dbshut`
3. Replace `ORACLE_HOME_LISTNER=$i` with `ORACLE_HOME_LISTNER=$ORACLE_HOME`
4. Save the file.

Solaris:

1. `su - oracle`
2. `vi $ORACLE_HOME/bin/dbstart & vi $ORACLE_HOME/bin/dbshut`
3. Replace `ORACLE_HOME_LISTNER=$i` with `ORACLE_HOME_LISTNER=$ORACLE_HOME`
4. Replace `ORATAB=/etc/oratab` with `ORATAB=/var/opt/oracle/oratab`
5. Save the file.

Changes in Service Pack 1

This service pack contains fixes to a number of areas of the product, including:

- **APIs/Building Blocks.** A bug which prevented some `loadByTemplate(String)` methods in the `blackboard.admin.persist` package from returning correct data on Oracle systems has been corrected. Building Blocks or integrations which depend on these API methods do not need to update code.

- **Accessibility.** Blackboard has addressed two minor accessibility issues in this release. We have added heading tags to the page title tag, and step title tag. We have also added a skipping mechanism to each module and menu item on portal tab pages. Blackboard continues to ensure that its products remain accessible and comply with appropriate US and International statutes.
- **Discussion Board** A number of medium severity issues related to the new discussion board functionality have been fixed in this release.
- **Gradebook** At the request of many users significant changes have been made to manual grade workflow from the initial design offered in Application Pack 1 for release 7. These changes, validated with client partners, also includes a new setting on the “Gradebook Settings” page which allows for the suppression of the class average to students.

Please see the Resolved Issues Report for Service Pack 1 for detailed information on issues fixed in the Service Pack.

DISCUSSION BOARD

Forum and Thread Grading

Several new features have been added to the Discussion Board expanding it beyond its primary use as a communication medium and transforming it into a comprehensive and interactive teaching tool that fosters academic exchange and debate.

Grading settings are now available when creating or modifying a forum in a Course or Organization. When grading is enabled for a forum, Instructors, Teaching Assistants, and users with the Grader or Manager forum roles will be able to access the Grade Forum Users page. Instructors may choose to grade the forum or to enable thread grading within the forum. If thread grading is enabled for the forum, Instructors have the option to turn grading on or off for each new thread.

Grading Discussion Board forums and threads is not available with the Blackboard Learning System – Basic Edition.

Discussion Board Statistics

Discussion Board statistics are now a part of the Performance Dashboard. The total number of forums in which the user has participated is displayed for each user in this column. Clicking on the number in this column directs the instructor to a user detail page that displays links to all forums in which the user has participated and usage statistics for the user in each forum. Statistics displayed include:

- Total Posts
- Date of Last Post
- Average Post Length
- Minimum and Maximum Post Lengths
- Average Post Position

Additionally, the instructor can grade discussion board participation from this page.

Discussion Board statistics is not available with the Blackboard Learning System – Basic Edition.

Forum Moderation and User Management

By default, Discussion Board users are given forum roles based on their course, organization, or system role. Instructors and Leaders are given the Manager role by default. Managers control user privileges within the Discussion Board through the use of roles. For example, the Manager may delegate responsibility for reviewing posts to a Moderator.

When creating a forum or modifying a forum's settings, instructors have the option of forcing moderation. If moderation is enabled, when a user other than a Moderator or Manager submits a post, the post is saved to the Moderation Queue. New posts are displayed in the queue for review and publication. If a post is returned, a return message can be attached to the post allowing the Moderator to inform the user why the post was not accepted for publication.

By default, Discussion Board users that are assigned to a group are allowed to create threads in the Group Discussion Board forum. This means that group users can now begin using the Discussion Board immediately and do not have to wait for the instructor to create a forum and begin a thread.

Rate Posting

Post rating allows users to rate posts in the forum on a scale of one to five stars. When enabled, post rating is a simple yet effective tool for peer review.

Thread Subscriptions

The Subscribe to Thread notifies users each time a new post is added to the thread. The notification is enabled by the user and sent to the email address stored in the user's Personal Information. Users will not be able to enter a different email address to which notifications will be sent to prevent spam from being generated from the Discussion Board. This feature is available to all users with a forum role other than "blocked" if the feature is enabled for the forum.

Enhancements of Existing Features

The following enhancements improve the user experience in the Discussion Board:

- Instructors can copy Discussion Board forums to the same Discussion Board or to another Discussion Board in the course
- Users can save posts as drafts, allowing them to work on a post over more than one Blackboard session until the post is ready for publishing.
- Instructors now have an availability option for all forums on the Add/Modify Forum page. The availability option replaces the functionality of archiving forums. Forums that were archived before an update to 7.0 Application pack 1 will become Unavailable after the update process.
- The Discussion Board uses Adaptive Release rules and other availability rules such as Date set on any tool links to the Discussion Board.
- Searches can be limited or expanded to include current forum, current thread, or all forums in the course.
- Users can group posts into Collections. Collections can be sorted and filtered to customize the Collection for easy viewing and printing.
- Instructors can now "lock" a forum to prevent additional posts, but allow users to read existing threads. This feature replaces "archive" forum

DOMAIN MANAGEMENT

Domain Collections

Domains offer a customizable, flexible, and secure system administration model. Domains gather courses, users, tabs, modules, and organizations into defined sets called Collections. Each Domain can have one or many collections. Once established, administration of a Domain is controlled by assigning System Roles to users who will manage the items in the Domain.

System Administrators have the ability to create Domains that represent different parts of their institution. In the context of the Blackboard Academic Suite, a Domain can include Collections of users, courses, organizations, modules, and tabs defined according to multiple, specific criteria.

Domain Administration

Administration of domains is set up by assigning users System Roles within the Domain. Each Domain administrator can be assigned any number of System Roles. The privileges provided by these roles are additive, so they can be combined to create several different models of Domain administrators. The same user can be an administrator in multiple Domains.

Once the Domains are defined, all users who have administrator privileges within those Domains will have a tailored way of using the Administrator Panel functions. Their view of the Administrator Panel will be specific to their Domain(s) and the privileges of their System Role(s).

Domain Configuration

Domains are only available if the Blackboard Community System is licensed. Configuring Domains is a process that requires detailed planning based upon the policy rules and organizational structure of the institution. Ask your Blackboard Account Manager for information about service offerings to help with planning for this capability.

FLEXIBLE ROLES AND PRIVILEGES

Creating New and Customizing Existing System Roles

System Administrators can create an unlimited number of System Roles and selectively assign hundreds of Administrator Panel and Control Panel privileges to each role.



NOTE: The update may result in changes to privileges that are already assigned. Verify all privileges before making the system available to users.

Privileges

The User Privileges page on the Administrator Panel has been replaced by the combination of the following pages:

- **Administrator Panel > System Roles**
The System Administrator can add new System Roles, modify the names and descriptions of System Roles, and manage the privileges assigned to System Roles. Hundreds of privileges can be selectively assigned to System Roles.
- **Administrator Panel > Course/Organization Roles**
The System Administrator can modify the names and descriptions of Course/Organization Roles and manage the privileges assigned to Course/Organization Roles.
- **Administrator Panel > Privileges**
The System Administrator can see an overview of which System Roles and Course/Organization Roles have specific privileges. They can also make some privileges available or unavailable system-wide or redirect that action to a URL outside the system.

The new Privileges page includes searching capabilities and has the option to go directly to the role page where the privileges can be managed for a specific role. Note that due to this redesign, privileges cannot be changed for multiple roles on the same page.

Multiple System Roles per User

Users can have multiple System Roles. When a user has more than one System Role, the privileges assigned to the System Roles are additive. If one System Role allows an action, but another System Role does not allow the same action, the user will still be able to perform the action.

Multiple System Roles per user is only available if the Blackboard Community System is licensed.

Enhancements and Changes to Existing Features

In order to facilitate flexible roles and privileges, some aspects of privilege management and where privileges apply were changed:

- When administrators create courses, they no longer have the option to add an instructor to the course on the same page because this involved overlap of course creation, user creation, and enrollment creation privileges.
- When administrators manage users, there are separate privileges for managing enrollments, which are managed under Courses and Organizations. If the administrator has the necessary privileges to

manage enrollments, there is a convenient link that allows the administrator to go directly from managing Users to managing Course or Organization enrollments.

- The organization of pages for managing Courses, Organizations, Users, Enrollments, and Catalogs in the new Administrator Panel is significantly different from prior releases. Wherever possible, the privileges that had been set for System Roles in prior releases has been reconstructed. In some cases, an identical mapping of privileges to roles was not possible. The new Privileges page provides a clear reference for which roles have which privileges in 7.1.



TIP: Document any User Privileges customizations on the system prior to the update to compare to the new System Role privileges after the update.

- Changing the privileges for the System Role of Guest and the Course or Organization Role of Guest is no longer an option.
- Changing the privileges for the System Role of System Administrator is no longer an option so that there is always a role that can perform all functions. If it is desirable to limit the privileges of the System Administrator, a similar role can be created and modified in 7.1.



NOTE: All privileges will be assigned to the System Administrator role after the update even if customizations had been made to system prior to the update.

- There is now a page under Manage User for administrators to manage Organization enrollments.

In 7.0, the Admin > User Privileges page allowed privileges to be made unavailable or redirected to a URL outside the system. Some of these privileges were not designed to function in this way. Therefore these privileges do not have a **Modify** button and cannot be made unavailable or redirected in 7.1 on the new Admin > Privileges page. These privileges are:

Control Panel > List / Modify Users > Modify User Properties > Change User's Role in Course/Organization
 Control Panel > Course/Organization Copy > Copy Course/Organization with Users (Exact Copy)
 Control Panel > Course/Organization Copy > Copy Materials into a New Course/Organization
 Control Panel > Course/Organization Copy > Copy Materials into an Existing Course/Organization
 Administrator Panel (Community System- Management) > Tabs
 Administrator Panel (Community System- Management) > Modules

COURSE AND ORGANIZATION CATALOGS BY ROLE

Customize Catalog Views by Institutional Role

Each category in a Course or Organization Catalog can be made available to one or more Institution Roles so that views of the catalogs are customized to the categories that are appropriate for those roles. For example, a Law School student could see a different set of categories and courses than a Business School student, yet still be accessing the same catalog.

Catalog Availability

The Course and Organization Catalogs can be made available to users from any Tab, using the Course Catalog or Organization Catalog modules. The Catalogs are also available from the Course Search box on the Courses tab and the Organization Search box on the Community tab.

Catalog Management

Management of the catalogs and options are on the following pages:

- **Administrator Panel > Course Catalog or Organization Catalog**
Administrators manage the Catalog and its categories, including associating categories with Institution Roles.
- **Administrator Panel > Gateway Options**
Administrators control whether or not the Catalog is accessible from the Gateway page, or if it is redirected to a different URL from the Gateway page.
- **Administrator Panel > Courses or Organizations**
Administrators specify the categories for multiple courses or organizations.
- **Administrator Panel > Courses > Manage Course > Categorize Course**
Administrator Panel > Organizations > Manage Organization > Categorize Organization
Administrators specify the categories for a specific course or organization.

Catalog Views Configuration

Different Catalog Views based on Institution Role is only available if the Blackboard Community System is licensed. Implementing multiple catalog views requires significant planning based upon the organizational structure and business rules of an institution. Consider the following changes in existing catalog functionality:

- In order to clearly present multiple views, category hierarchies are presented on the Catalog page, not in the Catalog module. Clicking on a category in the module goes directly to that category on the Catalog page. Multiple levels are not shown in the module.
- Access to the Course Catalog from the Gateway page is independent from access to the Course Catalog in the module so that they can be managed separately.
- Access to Courses and Organizations from the Catalogs is determined by whether the Course or Organization is guest accessible.



NOTE: Prior functionality also checked to see if the user was an administrator or enrolled in the course, but these checks are no longer done due to performance constraints. Therefore some users who had access to courses from the Catalog may no longer have access using the Catalog if they have a role in the course but the course is not guest accessible. These users should use the Courses modules instead.

- Because the Catalogs can be accessed from any tab and because their navigation is self-contained, they do not have a breadcrumb.

VISUAL TEXT BOX EDITOR

Cross-Browser, Cross Platform Support

The Visual Text Box Editor is now available to users running any supported browser.

The Visual Text Box Editor is compatible with the following browsers on Windows Operating Systems:

- Microsoft Internet Explorer 6.0
- Mozilla Firefox 1.0
- Netscape 8.0

The Visual Text Box Editor will not work with older versions of these browsers. Instead, the standard options for entering text will appear.

The Visual Text Box Editor is compatible with the following browsers on Macintosh Operating Systems:

- Safari 2.0
- Mozilla Firefox 1.0

When run on Safari, the Visual Text Box Editor Lite Version appears. The Lite Version does not include the button controls for several features because Safari does not yet support those rich-text editing features. Some features that are not accessible from a button in the Lite Version may still be activated using keyboard shortcuts. For example, the cut, copy, and paste functions may still be used through the keyboard shortcuts. Macintosh users may also download and use the free Mozilla Firefox 1.0 (or higher) Web Browser to use all the features of the Text Box Editor.

Firefox users, on all operating systems, must perform an extra step to enable the cut, copy, and paste functions. This is a function of the Firefox browser, and not Blackboard applications. The first time an attempt is made to cut, copy, or paste text in the Visual Text Box Editor, a message from Firefox will appear explaining that the action is not allowed. A link is provided for information on how to enable the cut, copy, and paste functions by editing a Firefox configuration file. The link currently points to <http://www.mozilla.org/editor/midasdemo/securityprefs.html>. Please check with Firefox for the most up-to-date information on using rich-text tools for cut, copy, and paste. Macintosh users may find that this does not fully resolve the problem, particularly because Firefox does not permit pasting text from Microsoft Office files on Mac. To accomplish this task, paste the text into a basic text editor, such as TextEdit or Notepad and then paste the text into the Visual Text Box Editor.

Additional Locations for the Visual Text Box editor

The Visual Text Box Editor has been added to many pages in the application. The following table lists all locations:

VISUAL TEXT BOX EDITOR						
Area	File Upload Possible without VTBE?	Upload Files from Desktop via VTBE	VTBE Rows Displayed (without Content System)	VTBE Rows Displayed (with Content System)	Content System Links Row 3	URL Links Row 3
Announcement: Course/Org	No	No	2	3	Yes	Yes
Announcement: System	No	No	2	3	Yes	Yes

VISUAL TEXT BOX EDITOR						
Area	File Upload Possible without VTBE?	Upload Files from Desktop via VTBE	VTBE Rows Displayed (without Content System)	VTBE Rows Displayed (with Content System)	Content System Links Row 3	URL Links Row 3
Assessment: Add/Modify Test Question	Yes	No	1*	1*	Yes	No
Assessment: Pool Description and Instructions	No	No	1*	1**	Yes	No
Assessment: Survey Description and Instructions	No	No	1*	1**	Yes	No
Assessment: Test Description and Instructions	No	No	1*	1**	Yes	No
Assignment (Instructions)	Yes	Yes	3	3	Yes	Yes
Calendar Event: Course/Org	No	No	2	3	Yes	No
Calendar Event: Personal	No	No	2	3	Yes	No
Calendar Event: System	No	No	2	3	Yes	No
Content: Chat Link	No	Yes	3	3	Yes	Yes
Content: Course Link	No	Yes	3	3	Yes	Yes
Content: DB Link	No	Yes	3	3	Yes	Yes
Content: External Link	No	Yes	3	3	Yes	Yes
Content: Folder	No	Yes	3	3	Yes	Yes
Content: Group Link	No	Yes	3	3	Yes	Yes
Content: Item	Yes	Yes	3	3	Yes	Yes
Content: Learning Unit Shell	No	Yes	3	3	Yes	Yes
Content: Offline Content	No	Yes	3	3	Yes	Yes
Content: Syllabus Builder	No	Yes	3	3	Yes	Yes
Content: Tool [Select Tool] Link	No	Yes	3	3	Yes	Yes
Content: Virtual Classroom Link	No	Yes	3	3	Yes	Yes
CS Workflow Instructions	No	No	n/a	3	Yes	No
CS Workflow Comments	No	No	n/a	3	Yes	No
CS Workflow Response	No	No	n/a	3	Yes	No
Discussion Board Forum: Community	No	No	2	3	Yes	Yes

VISUAL TEXT BOX EDITOR						
Area	File Upload Possible without VTBE?	Upload Files from Desktop via VTBE	VTBE Rows Displayed (without Content System)	VTBE Rows Displayed (with Content System)	Content System Links Row 3	URL Links Row 3
Discussion Board Forum: Course/Org	No	No	2	3	Yes	Yes
Discussion Board Forum: Group	No	No	2	3	Yes	Yes
Discussion Board Message: Community	Yes	Yes	3***	3	Yes	Yes
Discussion Board Message: Course/Org	Yes	Yes	3***	3	Yes	Yes
Discussion Board Message: Group	Yes	Yes	3***	3	Yes	Yes
eMarketplace: Category	No	No	2	3	Yes	No
eMarketplace: Product	Yes (images only)	No	2	3	Yes	No
eMarketplace: Settings	No	No	2	3	Yes	No
Group Description	No	No	2	3	Yes	No
Messages	Yes	No	2	3	Yes	No
Modules: ALL > Description	No	No	2	2	No	No
Modules: HTML Module Type	No	Yes	3	3	Yes	Yes
Modules: Multi-Section Module Type	No	No	2	3	Yes	Yes
Modules: Guest Deposit Type	No	No	2	3	Yes	Yes
Modules: Transaction Account Module Type	No	No	2	3	Yes	Yes
Portfolios: Administrator Template Creation	No	No	2	3	Yes	Yes
Portfolios: Comments	No	No	n/a	3	Yes	No
Portfolios: User Add Item (Blank or Template)	No	No	n/a	3	Yes	Yes
Staff Information: Folder	No	Yes	3	3	Yes	Yes
Tabs: Manage Hot Link Content > Add External Link	No	No	2	3	Yes	Yes

VISUAL TEXT BOX EDITOR						
Area	File Upload Possible without VTBE?	Upload Files from Desktop via VTBE	VTBE Rows Displayed (without Content System)	VTBE Rows Displayed (with Content System)	Content System Links Row 3	URL Links Row 3
Task: Course/Org	No	No	2	3	Yes	No
Task: Personal	No	No	2	3	Yes	No

* = 1 row displayed, 2nd row is collapsed by default but can be expanded

** = 1 row displayed, 2nd and 3rd rows are collapsed by default but can be expanded

***= 3rd row allows file upload from desktop only if that option has been enabled (applies to DB and Messages only)

Opt-In Setting for the Visual Text Box Editor

Administrators can allow users to opt-in to the Visual Text Box Editor instead of opting out. Enabling the Visual Text Box Editor for the system is still accomplished through the Administrator Panel under Text Box Editor. A checkbox for requiring users to opt-in now appears on the page. If this is checked, enabling the Visual Text Box Editor for the system does not automatically turn on the Visual Text Box Editor for all users; each user can enable the Visual Text Box Editor individually by using the Visual Text Box Editor setting found in Personal Information.

WebEQ and MathML

The WebEQ and MathML tools on the Visual Text Box Editor have been enhanced. When a WebEQ equation is inserted using the new Visual Text Box Editor, a place holder will appear in the body of the editor. Clicking Preview will display the equation, and the equation will render in Display View, including equations that contain left angle brackets (<). The spacing around the equation has been enlarged and the text size has been decreased so that the entire equation is clearly visible by default. The equation may be modified by selecting the place holder and clicking the WebEQ icon on the Visual Text Box Editor.

Users may receive a pop-up box when launching WebEQ that asks the user to trust an applet provided by Design Science, the maker of WebEQ. If users click Always, the pop-up will no longer appear on that computer when launching WebEQ.

MathML may now include whitespace in the editor without affecting the equation.

Building Blocks Compatibility

The new Visual Text Box Editor may be included on pages created by Building Blocks developers using the publicly available Beta versions of the following APIs:

- <bbUI:textbox>
- WysiwygText
- FileLocation (interface)
- FileLocationImpl
- Plus several FileLocation implementations (such as ContentFileLocation and TempFileLocation)

More information is provided in the API specification.

ASSESSMENTS AND GRADEBOOK

Multiple Attempts

Assessments may now be set to allow unlimited attempts or a specific number of attempts. The Gradebook displays all of the attempts. The Gradebook item is scored based on grading option: last attempt, first attempt, highest score, lowest score, or average of scores. Additionally, an Override field has been included so that the instructor can override the score independent of any attempts.

Now that all attempts are visible in the Gradebook, the clearing options have been enhanced as well. The instructor may choose to clear (or delete) the last attempt, first attempt, highest attempt, lowest attempt, or all attempts within a specified date range. This action may be performed by item (for all students at once) or by user (for a specific user).

Self-Assessment Options

The deployment of tests has been enhanced to permit Self-Assessment in two forms: allow the instructor and student to view the grade, or only allow the student to view the grade. In each case, the grade is not included in the final score for the student.

When deploying a test in a course, the instructor should uncheck the option called *Include this test in Gradebook score calculations* to allow students to take the test without affecting their overall score. Both the instructor and the student will still be able to review the results of the test. This option was previously only available through the Gradebook but is now also available in the course content area when deploying a test.

The second self-assessment option, called *Hide the score of this test from the Gradebook* will allow the student to take the test without displaying the results to the instructor.

Test and Survey Import/Export

The Test and Survey Managers have been enhanced to allow for importing and exporting, much like the Pool Manager in Release 6. Users can export the test or survey package to their local computers and, if Content Collection integration is on, can also select to export to their Content Collection in the Blackboard Content System.

The ability to export and import tests and surveys assists with content reuse and collaboration. When a test (or survey) is created, creation settings are determined, questions and answers are developed, and metadata is associated. Now, all of that information can be reused simply by exporting the entire test to the local computer or to the Content Collection, and then importing it into another course's Test or Survey Manager. Once the test or survey has been imported, any modifications may be made to customize it for the other course.

Additionally, users can export to Content Collection, further facilitating collaboration. Storing the Test or Survey package in the Content Collection allows the user to share the package with others or make the package discoverable in both the Content Collection Search and the Learning Objects Catalog.

Extra Credit

When creating a test, questions may now be marked as extra credit only. This means that the points possible for the entire test will not include the points possible for that question. If the question is answered correctly, the question points will be added to the points correct, but if the question is answered incorrectly, there is no score penalty.

Customized Feedback

Feedback options were previously organized into four groups: score only, score + detailed results, all of the above + correct answers, and all of the above + detailed results, all of the above + feedback. These options have been ungrouped so that users may select any combination of the score, submitted answers, correct answers and feedback to be displayed to the student at the end of an assessment.

Enhanced Submission Reports

The submission report for assessments now includes the following user information: First Name, Last Name, Course Name, Username, Course ID, name of the Assessment, and date/time of submission. This may be used as verification by the student that they have indeed submitted the assessment. Some instructors may require students to print this as a permanent record of the activity.

SIF AGENT

Exchanging and Synchronizing Data

The School Interoperability Framework (SIF) is an industry initiative to develop a scalable solution for data exchange, synchronizing data entered in one system with the data in other systems within the SIF framework.

A SIF implementation is a distributed networking system that consists of a Zone Integration Server (ZIS) and one or more SIF integration agents that communicate with the ZIS, all organized into a zone.

The Blackboard SIF Agent

The Blackboard SIF Agent registers with a ZIS and indicates the data the Blackboard system can receive. ZIS tracks the data that the Blackboard SIF Agent can receive and forwards a message to the Blackboard SIF Agent if another agent has posted an applicable data change to the ZIS.

The Blackboard SIF Agent conforms to SIF standards for receiving updates to user information data from the ZIS. It subscribes to data changes but does not publish data changes. SIF communication is automated. Once the Blackboard SIF Agent is configured, it automatically updates information when notification of a data change is received from the ZIS. The frequency of updates is configurable.

The Blackboard SIF Agent is not available with the Blackboard Learning System – Basic Edition.

BLACKBOARD ACADEMIC SUITE CHANGES

Changes to the *Blackboard Learning System*

- **New Language Packs**
Two new Language Packs are included in this release: Traditional Chinese and Arabic. The Arabic Language Pack does not include right to left display.
- **Admin Panel as Module Tab**
The areas on the Administrator Panel are now modules, as seen on other module tabs. Administrators can modify the page layout and collapse modules.
- **Enhanced Administrator Pages for Course, Organization and User Management**
The Courses, Organizations, and Users pages have enhanced sorting and paging as well as powerful searching capabilities. Many functions have been streamlined and unnecessary receipt pages eliminated.
- **Spell Check**
Spell Check is now present in all places where email is used in the application, plus other key areas where proper spelling is essential, such as the Glossary tool and Assignment comments to/from instructors.

Changes to the *Blackboard Community System*

- **e-Commerce: Variable Price Products**
When enabled for a product, users determine the price of the product at the time the order is placed. This new product setting supports payment of parking tickets, library fines, donations, and more.
- **e-Commerce: Sales History, Product Movement, Total Sales, and My Accounts Reports**
e-Marketplace reports are available for product sales, including total taxes paid, product movement, and/or total sales per vendor in the system. A My Accounts report details the total deposits and convenience fees paid for each account in the specified date range. All reports can be sorted and filtered by vendor and/or date range with the option to print or export results.
- **e-Commerce: Fraud Rule Support**
Fraud rule checking prevents a credit card transaction from successfully completing if the transaction triggers a Fraud Rule in the Payment Gateway.
- **System Discussion Boards**
Forum moderation, post rating, thread subscriptions, ability to save posts as drafts, general user interface and usability improvements, greater control over forum availability, improved search functionality, and improved collection of posts and threads.
- **Administrator Panel**
The Administrator Panel now includes customization options for module themes.
- **Module Descriptions**
The Descriptions field now includes a Visual Text Box Editor to improve administrator use of the Modify Content page.
- **Manage Tabs and Manage Modules**
Improved administrator management of tabs and modules through additional description fields to help administrators manage modules or tabs with the same name.

Changes to the *Blackboard Content System*

- **Assessment Import/Export**
The Test and Survey Managers have been enhanced to allow for importing and exporting, much like the Pool Manager in Release 6. Tests and surveys can be imported/exported to the local computer or to the Content Collection in the Blackboard Content System.
- **Folder View**
The Folder View of the Content System menu will by default only display the contents of the first content area, such as My Content. Other areas of the menu will be collapsed, and the user can click the name of the area to expand it. This enhancement dramatically improves performance for any area that

contains a large amount of data because the directory structure is not loaded until the user elects to expand that view.

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™* Application Pack 1 (Release 7.1). 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.
- When installing the Java 2 Platform, Standard Edition (J2SE), make sure that both the JDK and the JRE components are installed. Also, ensure that there are no spaces in the path name to the J2SE.



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 SP1	Sun® Solaris™ 10	Red Hat® Linux® Advanced Server 3.0*
<ul style="list-style-type: none"> • Microsoft® SQL Server 2000 Enterprise Edition (SP4) or Microsoft® SQL Server 2000 Standard Edition (SP4) • Microsoft® Internet Information Server (IIS) 6 (not included with Blackboard) • Java 2 Platform, Standard Edition Version 5.0 • Perl 5.6.1 / Perl Ex 2.3.1 	<ul style="list-style-type: none"> • Oracle 10g (Release 1) • Apache HTTP Server Version 1.3.33 • Java 2 Platform, Standard Edition 5.0 • Perl 5.6.1 / Perl Ex 2.3.1 	<ul style="list-style-type: none"> • Oracle 10g (Release 1) • Apache HTTP Server Version 1.3.33 • Java 2 Platform, Standard Edition 5.0 • Perl 5.6.1 / Perl Ex 2.3.1

* 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 (version 9.2.0.4). Small-Scale Oracle is supplied by Blackboard.

Compatible Server Configurations

SUN SOLARIS	SUN SOLARIS	SUN SOLARIS	SUN SOLARIS
Sun® Solaris™ 10	Sun® Solaris™ 10	Sun® Solaris™ 9	Sun® Solaris™ 9
<ul style="list-style-type: none"> Oracle 9i version 9.2.0.x Apache HTTP Server Version 1.3.33 Java 2 Platform, Standard Edition 5.0 Perl 5.6.1 / Perl Ex 2.3.1 	<ul style="list-style-type: none"> Oracle10g (Release 2) Apache HTTP Server Version 1.3.33 Java 2 Platform, Standard Edition 5.0 Perl 5.6.1 / Perl Ex 2.3.1 	<ul style="list-style-type: none"> Oracle 9i version 9.2.0.x Apache HTTP Server Version 1.3.33 Java 2 Platform, Standard Edition 5.0 Perl 5.6.1 / Perl Ex 2.3.1 	<ul style="list-style-type: none"> Oracle 10g (Release 1) Apache HTTP Server Version 1.3.33 Java 2 Platform, Standard Edition 5.0 Perl 5.6.1 / Perl Ex 2.3.1

RED HAT LINUX

Red Hat® Linux® Advanced Server 3.0

- Oracle 9i* version 9.2.0.x
- Apache HTTP Server Version 1.3.33
- Java 2 Platform, Standard Edition 5.0
- Perl 5.6.1 / Perl Ex 2.3.1

Red Hat® Linux® Advanced Server 3.0

- Oracle 10g (Release 2)
- Apache HTTP Server Version 1.3.33
- Java 2 Platform, Standard Edition 5.0
- 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.

- Non-English applications, both operating systems and databases (such as a Chinese-language version of Oracle), are considered compatible with *Blackboard Academic Suite* Application Pack 1 (Release 7.1). These systems have not undergone official Blackboard Product Development testing.
- The Blackboard Academic Suite Application Pack 1 (Release 7.1) products ship with Apache HTTP Server Version 1.3.33 (UNIX operating systems only).
- The Blackboard Academic Suite Application Pack 1 (Release 7.1) products ship with Perl 5.6.1 / Perl Ex 2.3.1

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	10.4
MICROSOFT® INTERNET EXPLORER® WEB BROWSERS	5.2	N/A	N/A	N/A	N/A	N/A
	5.5	N/A	N/A	N/A	N/A	N/A
	6.0	C	✓	N/A	N/A	N/A
	7.0	N/A	P	N/A	N/A	N/A
NETSCAPE® AND MOZILLA® WEB BROWSERS	NS 7.1	C	C	C	C	N/A
	NS 8.0	C	✓	N/A	N/A	N/A
	Firefox 1.0	C	✓	C	✓	✓
APPLE® SAFARI® WEB BROWSERS	1.0	N/A	N/A	C	N/A	N/A
	1.1	N/A	N/A	N/A	C	N/A
	1.2	N/A	N/A	N/A	✓	N/A
	2.0	N/A	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
P	Provisional – will test on Beta versions of new platforms and browsers. Certification is dependant on release by 3 rd parties

* 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 preview version of Mozilla Firefox (version 0.10.0) is not supported.

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.

UPDATE INSTRUCTIONS FOR WINDOWS (FROM 7.0 TO 7.1)

Overview

Before running the updater, please backup the system and make sure it can be restored. Remember to run the Pre-Update Change Report before running the Updater.

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. If .NET Building Blocks are used in the system, please see the troubleshooting section below for an important step to ensure that .NET Building Blocks function correctly in a load-balanced system.

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 UNC path.
- 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
```

Microsoft .NET Building Blocks on load-balanced configurations

After running the update, an error message may appear in the system when attempting to launch a Building Block built using Microsoft .NET. The system reports a Parser Error Message. To resolve the problem, copy the Webapp directory for any Building Blocks created using Microsoft .NET to each application server so that the directories may be accessed locally. Here is an example of the Webapp directory for a Building Block .NET directory on the UNC share:

```
\\UNC_server_name\bb_content\vi\bb_bb60\plugins\name_of_building_block\webapp
```

After copying the Building Blocks directories to each application server, follow these steps to remap the virtual directory in IIS on each application directory to point to the local directory:

1. Open **Start**. Select **Programs**. Select **Administrative Tools**. Select **Microsoft .NET Framework 1.1 Configuration**.
2. Expand **Runtime Security Policy**. Select **Machine**. Select **Code Groups**. Select **All_Code**.
3. Right-click **All_Code**. Select **New...**
4. Create a code group name, for example dotNETB2, and then choose **Next**.
5. Set **condition type** to URL.
6. In the URL field, enter:

```
file:///\\[local_server_name]\[sharename]
```

for example:

```
file:///\\bb_app_server_01\bb_content\vi\*
```

7. Restart IIS.

Token Warnings

Users may see token warnings that begin with antarg. These warnings can be safely ignored.

```
Infinite loop in tokens. Currently known tokens : [antargs.default.users.admini
trator.password]
Problem token : @antargs.default.users.administrator.password@ called from @ant
rgs.default.users.administrator.password@
Infinite loop in tokens. Currently known tokens : [antargs.default.users.integr
ation.password]
Problem token : @antargs.default.users.integration.password@ called from @antar
s.default.users.integration.password@
Infinite loop in tokens. Currently known tokens : [antargs.default.users.rootad
in.password]
Problem token : @antargs.default.users.rootadmin.password@ called from @antargs
```

```
default.users.rootadmin.password@  
Infinite loop in tokens. Currently known tokens : [bbconfig.cs.db.cms-user.pass
```

Language Pack Changes

To ensure consistency across releases, the Blackboard Academic Suite Updater will compare the existing en_US language pack against the version that is being installed. The differences are noted and output in a file called bundle_diff.txt. This file is added to the blackboard/backups/<updater_time_stamp> directory. Use this file to review the text differences between releases and make updates to any custom Language Packs.

UPDATE INSTRUCTIONS FOR WINDOWS (FROM 6.3 TO 7.1)

Overview

The Release 7.1 Updater has been completely redesigned for easy and reliable updates from Release 7 forward. The Release 7.1 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 7.1	The Update from Release 6.3 to Release 7.1 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 and above supports UNC shares for accessing content files stored on a separate server. The file sharing must be changed to UNC before using Release 7.1.
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 and above requires IIS 6.0 and does not support IIS 5.0 Compatibility Mode.

DATABASE CHANGES FROM RELEASE 6.3 TO RELEASE 7.1

Overview

The *Blackboard Academic Suite* (Release 7.1) 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 7.1 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 7.1 database to require twice as much space as the Release 6.3 database.

National Character Set

Release 7.1 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 7.1 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 7.1.			
2	Request the Blackboard .1 Updater Binary and License File			
3	Plan for 7.1 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 7.1 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 7.1.

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 Mode to SIMPLE	The Recovery mode 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 Mode

Most clients will be using the FULL Recovery mode. This mode creates a full transaction history that would grow to unmanageable size during the update. Follow these steps to check the Recovery mode 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 mode 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 mode. 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 mode 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-Conversion Check 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-Conversion Check will display the amount of space required. To add space for the database, follow these steps:

- 1 Open **SQL Server Enterprise Manager**.
- 2 Right-click on the database bb_bb60.
- 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-Conversion Check 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-Conversion Check 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 7.1 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
```

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
```

Microsoft .NET Building Blocks on load-balanced configurations

After running the update, an error message may appear in the system when attempting to launch a Building Block built using Microsoft .NET. The system reports a Parser Error Message. To resolve the problem, copy the Webapp directory for any Building Blocks created using Microsoft .NET to each application server so that the directories may be accessed locally. Here is an example of the Webapp directory for a Building Block .NET directory on the UNC share:

```
\\UNC_server_name\bb_content\vi\bb_bb60\plugins\name_of_building_block\webapp
```

After copying the Building Blocks directories to each application server, follow these steps to remap the virtual directory in IIS on each application directory to point to the local directory:

1. Open **Start**. Select **Programs**. Select **Administrative Tools**. Select **Microsoft .NET Framework 1.1 Configuration**.
2. Expand **Runtime Security Policy**. Select **Machine**. Select **Code Groups**. Select **All_Code**.
3. Right-click **All_Code**. Select **New...**
4. Create a code group name, for example dotNETB2, and then choose **Next**.
5. Set **condition type** to URL.

6. In the URL field, enter:

```
file:///\\[local_server_name]\[sharename]
```

for example:

```
file:///\\bb_app_server_01\bb_content\vi\*
```

7. Restart IIS.

Token Warnings

Users may see token warnings that begin with antarg. These warnings can be safely ignored.

```
Infinite loop in tokens. Currently known tokens : [antargs.default.users.admini
trator.password]
Problem token : @antargs.default.users.administrator.password@ called from @ant
rgs.default.users.administrator.password@
Infinite loop in tokens. Currently known tokens : [antargs.default.users.integr
tion.password]
Problem token : @antargs.default.users.integration.password@ called from @antar
s.default.users.integration.password@
Infinite loop in tokens. Currently known tokens : [antargs.default.users.rootad
in.password]
Problem token : @antargs.default.users.rootadmin.password@ called from @antargs
default.users.rootadmin.password@
Infinite loop in tokens. Currently known tokens : [bbconfig.cs.db.cms-user.pass
```

UPDATE WINDOWS FILE SHARING FROM DFS TO UNC

Overview

Release 7.1 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 7.1 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 7.1. 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 7.1 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 7.1 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.

UPDATE INSTRUCTIONS FOR UNIX (FROM 7.0 TO 7.1)

Overview

Before running the updater, please backup the system and make sure it can be restored. Remember to run the Pre-Update Change Report before running the Updater.

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 Open a command-line prompt and navigate to the directory that holds the Updater.
- 2 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.

- 3 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.
- 4 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.
- 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. Do not close the command line window or any of the other windows that pop-up during the update.
- 7 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.

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
```

Language Pack Changes

To ensure consistency across releases, the Blackboard Academic Suite Updater will compare the existing en_US language pack against the version that is being installed. The differences are noted and output in a file called bundle_diff.txt. This file is added to the blackboard/backups/<updater_time_stamp> directory. Use this file to review the text differences between releases and make updates to any custom Language Packs.

Oracle 10gR2 Installation Error

Users installing the Blackboard Academic Suite on the Oracle 10g (Release 2) database report that the Blackboard installation fails to complete. Only the BBADMIN and BB_BB60 users and tablespaces are created. When this problem occurs, the following error is reported in the bb7-installer-log.txt file:

```
java.sql.SQLException: ORA-01031: insufficient privileges  
at oracle.jdbc.driver.DatabaseError.throwSQLException(DatabaseError.java:125)  
Error while running tool: blackboard.apis.updatetools.FatalUpdateToolException:  
An error occurred creating the database for your virtual installation.  
Review log logs/update-tools/update-tool-log.txt for details
```

The update-tool-log.txt file reports the error as:

```
blackboard.apis.updatetools.FatalUpdateToolException: An error occurred  
creating the database for your virtual installation.  
at  
blackboard.apis.updatetools.tooldefs.install.DatabaseSetupTool.createAllDatabases  
(DatabaseSetupTool.java:91)  
  
java.sql.SQLException: ORA-01031: insufficient privileges  
at oracle.jdbc.driver.DatabaseError.throwSQLException(DatabaseError.java:125)
```

Prior to Oracle 10g Release 2, the **CONNECT** role was granted eight privileges: **create session**, **create table**, **create view**, **create synonym**, **create database link**, **create cluster**, **create sequence**, and **alter session**. With the release of Oracle 10.2.0.1, only the **create session** privilege is granted to the **CONNECT** role. Oracle removed the additional **CONNECT** role privileges in Oracle 10g (Release 2) to provide additional security by enforcing a principle of least privileges.

The Blackboard installer requires the **CONNECT** role to have both the **create session** and **create table** privileges.

The following will grant the two privileges that are required to install Blackboard on Oracle 10g (Release 2):

```
sqlplus "/as sysdba"  
SQL> @$ORACLE_HOME/rdbms/admin/rstrconn.sql  
SQL> GRANT create session, create table TO CONNECT;  
SQL> commit;  
SQL> exit
```

Another minor issue that occurs with Oracle 10g (Release 2) is that the databases and listener will not startup correctly when running the `dbstart` and `dbshut` oracle scripts to startup and shutdown the databases. To fix the problem follow these steps:

Linux:

5. `su - oracle`
6. `vi $ORACLE_HOME/bin/dbstart & vi $ORACLE_HOME/bin/dbshut`
7. Replace `ORACLE_HOME_LISTNER=$i` with `ORACLE_HOME_LISTNER=$ORACLE_HOME`
8. Save the file.

Solaris:

6. `su - oracle`
7. `vi $ORACLE_HOME/bin/dbstart & vi $ORACLE_HOME/bin/dbshut`
8. Replace `ORACLE_HOME_LISTNER=$i` with `ORACLE_HOME_LISTNER=$ORACLE_HOME`
9. Replace `ORATAB=/etc/oratab` with `ORATAB=/var/opt/oracle/oratab`
10. Save the file.

UPDATE INSTRUCTIONS FOR UNIX (FROM 6.3 TO 7.1)

Overview

The Release 7.1 Updater has been completely redesigned for easy and reliable updates from Release 7 forward. The Release 7.1 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 7.1	The Update from Release 6.3 to Release 7.1 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 7.1 Updater	Instructions for running the Updater. Be sure to prepare the database before running the Updater.

DATABASE CHANGES FROM RELEASE 6.3 TO RELEASE 7.1

Overview

The *Blackboard Academic Suite* (Release 7.1) 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 7.1 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 7.1 database to require twice as much space as the Release 6.3 database.

Change the National Character Set

Release 7.1 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 7.1 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 7.1			
2	Request the Blackboard 7.1 Updater Binary and License File			
3	Plan for 7.1 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 7.1 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 7.1.

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 Recovery 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.

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 7.1 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\$nls 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.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                XXXXXXXXXX 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_tablespace.sql
SQL> select 'drop tablespace ' || tablespace_name || ' including
contents;' from dba_tablespace 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_tablespace.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 7.1 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 Recovery 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 CAT EXP.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 CAT EXP.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 Envision
Blackboard Transaction System—Windows Edition	Install Envision
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.

ENVISERV 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` (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.

<p>NOTE: The OptiServ version must match the version of the Blackboard Community System.</p>

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

3. Rename the `C:\Optipserv` directory to `C:\Optipserv.orig`.

4. 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.

5. Launch the installer.

6. 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.

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

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

9. Enter the Blackboard Transaction System Tender information.

10. Enter the Privilege/Reader configuration.

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

Optiserv Config File and Command Line Tools

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

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

To start services:

```
C:\Optipserv\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
<i>Blackboard Academic Suite Hardware/Software Guide</i>	
Hardware Sizing Guide	Helps Administrators plan their hardware needs for running the <i>Blackboard Academic Suite</i> .
<i>Blackboard Academic Suite Installation Guide</i>	
Setup Guide	Installing the <i>Blackboard Academic Suite</i> .
<i>Blackboard Academic Suite Administrator Guides and Manuals</i>	
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> .
<i>Blackboard Academic Suite API Specifications and Building Blocks</i>	
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 Administrators using the snapshot tool.
<i>Blackboard Academic Suite End User Manuals</i>	

MANUAL NAME	DESCRIPTION
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> .
<i>Blackboard Content System API Specifications and Building Blocks</i>	
<i>Blackboard Content System</i> 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> .
<i>Blackboard Content System End User Manuals</i>	
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> .