

Blackboardlearn⁺

Release 9.1 Service Pack 5
Release Notes
9.1.50119.0



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About the Release Notes

The Release Notes provide System Administrators with information about the changes from the previous release, 9.1 Service Pack 4 (9.1 SP4) to this Service Pack, 9.1 Service Pack 5 (9.1 SP5). These changes have been categorized into two different types, end user impacts and system administration impacts. The categories are meant to assist you with planning your upgrade to this maintenance release.

The list below provides some highlights of changes that we believe will affect most usage scenarios. Always review the entire document and consider how the information listed below impacts your specific usage patterns.

If you are upgrading to Release 9.1 from Release 9.0, 8.0, 7.x, or CE 8, CE 4 or Vista, please go to the [Upgrade Center](#) for information targeted to your needs.

- ☑ **End User Impacts:** Items that fall into this category will generally be new features or enhancements that will improve the experience, but may require training.
 - Service Pack 5 does not contain any new features for end users. However, many issues surrounding copying content, copying file attachments, and copying embedded files from one course to another has been corrected. Check the Resolved Issues (link below) and the [Course Files Move Utility](#) section of this document for more detailed information.
 - [Resolved Issues](#) can impact your end users. While we hope this is a positive impact, review the list for any changes you may want to communicate to your community.
 - The [Known Issues](#) list provides a description and targeted path to resolution for issues specific to this release.
- ☑ **System Administration and Integration Impacts:** Items that fall into this category impact the administration of the system, including API integration. A review of Building Blocks, Snapshot or other integrations may be required.
 - [Course Files migrations](#) – Full support and a renewed recommendation for using the Move Files utility for all customers upgrading has been restored.
 - [Security issues](#) – Cross-site Request Forgery, Cross-site Scripting Attacks, and multiple Invalid Authorization vulnerabilities have been addressed.
 - System upgrade and performance tuning
 - [Performance and Scalability](#) – Details the latest analysis from our Performance Engineering team and how to tune an installation of this release.
 - [Supported Technologies](#) – Gives an overview of the changes to supported platform technologies and client technologies in this release.
 - [Installation and Upgrade Information](#) – Provides the supported upgrade paths to this release as well as tips for running the updater.

New Features and Enhancements

The Release Notes provide a high-level overview of the new features and enhancements for Release 9.1 SP 5. This release focuses on bug fixes, course files, and security.

If you are new to Release 9.1, please refer to the “Understanding the Change” document available for each product through [Behind the Blackboard](#). This is a comprehensive look at the features and functions of Release 9.1 and how they compare to your current production version. Also please work through the [Upgrade Center](#) where we have provided a step-by-step planning guide to assist you through this process.

System Administration

Default Maximum Upload Limit

The default size limit for content uploaded through the user interface has been raised from 250 MB to 2.5 GB. When attempting to upload files larger than 2.5 GB, Web Folders must be used.

Resolved Issues

Many critical client-reported issues have been resolved. For a detailed list, see the [Resolved Issues](#) page of the Maintenance Center.

Course Files Move Utility

Course Files migration is an integral part of the recommended upgrade path to Blackboard Learn 9.1. Full support and a renewed recommendation for using the Move Files Utility for all customers upgrading has been restored.

With the release of Learn 9.1, file management and storage was fundamentally changed. A new file storage system was implemented through the Control Panel of a course and is called "Course Files". Course Files gives users a way to manage their content files, file uploads, and attachments. It also provides a way for users to manage who has permission to see and change files stored here. Course Files provides a very basic file management interface.

For clients with a Content Collection license, Course Files is a window into their Content Collection files through the course Control Panel. All the functions of the Content Collection remain, but easy navigation to and from a course is available.

The Move Files Utility was created to populate the new file storage system with the course files from a legacy course. Since Blackboard Learn 9.1 GA was released, problems related to files moved using the utility after upgrading to 9.1 were discovered. With this release, we have holistically addressed this key area and can renew our recommendation for use of the Move Files Utility for all customers.

Restoring legacy courses in Blackboard Learn 9.1 without using the Move Files Utility places the files in a legacy storage area that is not revealed to users, although the files remain accessible in the course. New material developed after the course is upgraded is stored in the Files or Content Collection area. This does not give a consistent user experience managing files for a course. By using the Move Files Utility to move course files during an upgrade, legacy files are placed in Course Files, providing a consistent way to manage files in a course.

Security

Service Pack 5 addresses three key security vulnerabilities.

- **Cross-site Request Forgery** – Cross-site Request Forgery is an attack that attempts to execute actions on behalf of a user authenticated into Learn. SP5 provides further hardening of Learn Release 9.1 from cross-site request forgery by protecting key parts of the application such as the Grade Center.
- **Cross-site Scripting Attacks** – Cross-site Scripting is an attack where malicious scripts are injected into Learn. This occurs when specially crafted values are entered into a variable of a web page or stored and displayed by the application. Oftentimes, an attacker would need to convince an authenticated user to access a malicious web page or record in order for the attack to occur. Key parts of the application are now protected.
- **Authorization Vulnerabilities** – authorization vulnerabilities in the Address Book, Calendar, Grade Center, Portfolio Comments and Display, and Tasks have been eliminated.

Known and Resolved Issues

The list of issues resolved in Blackboard Learn Release 9.1 SP5 is available on the [Resolved Issues](#) page of the Maintenance Center.

The list of known issues in Blackboard Learn Release 9.1 is available on the [Known Issues](#) page of the Maintenance Center. The Known Issues page provides a list of the issue ID, description, and resolution path. This page is updated regularly with new client-reported issues.

Performance and Scalability

Blackboard continuously invests in making Blackboard Learn more responsive and capable of handling greater volumes of user traffic with each release. This section describes the performance and scalability issues addressed within this release of Blackboard Learn, as well as new information about optimizing the configuration.

Performance issues occur when application responsiveness for a system not under load fails to meet user expectations. Scalability issues occur when application responsiveness or stability of a page request for a system under load fails to meet user expectations.

Issues are identified by clients through our traditional support channels and as a result of the performance and scalability exercises performed as part of all Service Pack releases.

Performance Issues and Improvements

As part of the release, performance optimizations are introduced back into the product as a result of a customer issue or internally found problem. The Blackboard Performance Engineering team is responsible for refactoring under-performing areas of the application and verifying regression improvements based on the optimization.

Course Files

Customers restoring course archives from previous versions of Learn or from Vista or CE will see improvements in the time and resource demand to restore or import a package. An additional index was introduced to the schema to improve the processing time.

System Log

Unnecessary logging has been minimized with our monitor logging framework. This will reduce the verbosity of the log file writes, as well as eliminate unnecessary calls to the database.

Assessment

Students taking assessments in a highly concurrent fashion were experiencing slow system reactions submitting the assessment. An unnecessary constraint violation exception has been removed to eliminate this problem.

Assignment

Uploading files greater than 250 MB in size would return an error message to users. This issue has now been corrected so that students can upload larger assignment files. Performance tests have been performed up to 1GB in file size without issue.

Content System Search

The Lucene Indexing Service was unnecessarily retaining excessive memory during directory recursion due to a locking conflict with the existing IndexWriter. This was addressed through a minor system workaround.

Recommended Deployment Approach

64-Bit Deployments

Release 9.1 is the first release to offer an entire application and database footprint using 64-bit addressable memory. To take advantage of more addressable memory, Blackboard strongly encourages clients to deploy using 64-bit operating systems (OSs) and sub-components (Java and SQL Server or Oracle). As part of the 64-bit deployment, Blackboard encourages clients to take advantage of larger Java Virtual Machines (JVMs) that range from 4GB to 32GB in size. The preferred size varies from 4GB to 8GB, but performance testing has been conducted with acceptable performance as high as 32GB.

Customers should begin migrating from Tomcat clusters. Tomcat clustering was introduced for scalability purposes when the Blackboard Learn architecture was 32-bit and customers wanted the ability to increase their memory usage on a single server. With the option to virtualize on both 32-bit and 64-bit, Blackboard's benchmarking efforts have moved away from Tomcat cluster deployments. Customers can achieve similar performance in a virtual environment on the same physical server with multiple virtual instances as with a bare metal configuration with many Tomcat cluster instances. The difference in configurations is a smaller demand on the Apache or IIS web server fronting the Tomcat instance(s). The option to deploy a 64-bit JVM with larger heap sizes has suppressed the need for customers to run in a cluster option.

Blackboard recommends that customers consider a deployment approach consisting of larger 64-bit JVMs that are distributed across physical servers with the option to virtualize the hardware to take advantage of the CPU and Memory capacity of these systems.

Database Availability Options

Customers should also consider database availability options such as Microsoft SQL Server Active/Passive or Oracle RAC One Node, which is a single instance of Oracle RAC running within one node in a cluster. Additional nodes can be added within Oracle RAC to address scalability. In general, both offerings are more around high-availability and will have limited or no capability to improve performance.

For More Information

For more information about the SQL Server Failover capabilities of Blackboard Learn, contact Blackboard Consulting.

For information about running Blackboard Learn with RAC, see [Oracle RAC Support on UNIX in Blackboard Help for Administrators](#).

For more information about deploying Blackboard Learn, see the [Hardware Sizing](#) topics in [Blackboard Help for Administrators](#).

Recommended JVM Tuning Set

For every Service Pack, the Blackboard Performance Engineering team spends many hours studying the transactional and systemic performance of Blackboard Learn and whether particular tuning sets will have a positive or negative impact on performance or scalability.

This section provides the recommended Java Virtual Machine (JVM) tuning set as executed in the Blackboard Performance Engineering laboratory against Release 9.1 Service Pack 5. Customers are strongly encouraged to deploy their application environments in a 64-bit configuration using the recommended 4GB, 8GB, or larger tuning set.

Blackboard recommends using the following tuning set for 8GB JVMs (64-bit) on Windows, Linux, and Solaris systems using Java 1.6. These recommended settings are managed within the `bbconfig.properties` file.

```
bbconfig.min.heapsize.tomcat=8192m
bbconfig.max.heapsize.tomcat=8192m
bbconfig.max.permsize.tomcat=512m
bbconfig.max.stacksize.tomcat=320k

bbconfig.jvm.options.extra.tomcat= -XX:NewSize=2048m -
XX:MaxNewSize=2048m -XX:SurvivorRatio=4 -XX:+UseConcMarkSweepGC -
XX:+UseParNewGC -XX:+UseTLAB -XX:ParallelCMSThreads=3 -
XX:ParallelGCThreads=4 -XX:+PrintVMOptions -XX:+PrintGCDetails -XX:
+PrintGCTimeStamps -XX:+PrintGCTaskTimeStamps -
XX:+PrintCommandLineFlags -XX:+PrintGCApplicationStoppedTime -
XX:+PrintGCApplicationConcurrentTime -XX:+DisableExplicitGC
```

When using a 4GB heap size, change the following parameter values in the recommended tuning set:

```
bbconfig.min.heapsize.tomcat=4096m
bbconfig.max.heapsize.tomcat=4096m
-XX:NewSize=1024m -XX:MaxNewSize=1024m
```

Guidance for 32-bit configurations is also included below, however, to achieve the best performance and scalability, 32-bit environments are not recommended for use in production situations. 32-bit Windows and Red Hat Enterprise Linux deployments are limited to JVM sizes no greater than 1.7GB of addressable memory. This consists of the main heap area (Old and New Space) plus the permanent space. For 32-bit configurations with a 1.4GB heap size, Blackboard recommends changing the following parameter values in the recommended tuning set:

```
-Xms1400m -Xmx1400m -XX:NewSize=350m -XX:MaxNewSize=350m
```

Understanding the Settings

Additional performance tuning may be required for certain configurations depending on how much memory is available and what other processes are running. Some of the parameters below can be changed to match your particular environment and improve overall performance.

UseCompressedOops

Analysis of `-XX:+UseCompressedOops` parameter was performed over the last two service packs to improve the efficiency of addressable memory space. This option allows for the JVM to execute as a hybrid 32-bit and 64-bit addressable process to improve the efficiency of memory management. The setting cannot work for JVMs sized greater than 32 GB.

Supported Technologies

In every release, Blackboard devotes time and resources to make Blackboard Learn run on the latest operating systems, databases, and browsers available, with the goal of creating a system that is more manageable, more stable, and more user friendly.

This section highlights the major changes to the Supported Technologies and Browsers for this release. For the most up-to-date information, see [Blackboard Learn Release 9.1 SP5 Supported Technologies and Browsers](#) available on the [Maintenance Center](#) on [Behind the Blackboard](#)

The following sections highlight the new Platform and Client configurations tested for this release using the following support terms:

- **Certified:** Fully supported technology with highest level of testing before release.
- **Compatible:** Fully supported technology with minimal level of testing before release.
- **Unsupported:** Unsupported technology because it is either impossible or not tested.

Platform Technologies

32-bit Server Configurations

	Application Server/JDK 1.6	SQL Server 2005 (32-bit)	SQL Server 2008 (32-bit)	SQL Server 2008 R2 (32-bit)	Oracle 10gR2 (32-bit)
Windows Server 2003 SP2 (32-bit)	Compatible (32-bit JDK)	Compatible	Compatible	Unsupported	Unsupported
Red Hat Enterprise Linux Server 4 (32-bit)	Compatible (32-bit JDK)	Unsupported	Unsupported	Unsupported	Compatible
Red Hat Enterprise Linux Server 5 (32-bit)	Compatible (32-bit JDK)	Unsupported	Unsupported	Unsupported	Compatible

64-bit Server Configurations

	Application Server/ JDK 1.6	SQL Server 2005 (64-bit)	SQL Server 2008 (64-bit)	SQL Server 2008 R2 (64-bit)	Oracle 10gR2 (64-bit)	Oracle 11gR1 (64-bit)	Oracle 11gR2 (64-bit)
Windows Server 2003 SP2 (64-bit)	DATABASE ONLY	Compatible	Compatible	Compatible	Unsupported	Unsupported	Unsupported
Windows Server 2008 (64-bit)	Certified (64-bit JDK)	Unsupported	Certified	Certified	Unsupported	Unsupported	Unsupported
Windows Server 2008 R2 (64-bit)	Certified (64-bit JDK)	Unsupported	Certified	Certified	Unsupported	Unsupported	Unsupported
Red Hat Enterprise Linux Server 4 (64-bit)	Compatible (64-bit JDK)	Unsupported	Unsupported	Unsupported	Compatible	Unsupported	Unsupported
Red Hat Enterprise Linux Server 5 (64-bit)	Certified (64-bit JDK)	Unsupported	Unsupported	Unsupported	Certified	Compatible*	Certified
Sun Solaris 10 (64-bit SPARC)	Certified (64-bit JDK)	Unsupported	Unsupported	Unsupported	Certified	Compatible*	Certified

* Blackboard supports only build 11.1.0.7 of Oracle 11gR1.

Configuration Notes:

- Microsoft® SQL Server 2005 must be installed with SP3 or above.
- Microsoft SQL Server 2008 must be installed with SP1 or above.
- Windows Server 2003 should be installed with SP2 or above.
- Windows Server 2003 64-bit can be used to host the SQL Server Database but the application server in such configurations should be Windows Server 2003 32-bit. Run Windows 2008 in order to run a 64-bit Windows app server.

Non-English Operating Systems and Databases

Non-English operating systems and databases (such as a Chinese-language version of Oracle), are considered compatible with Blackboard Learn.

Oracle RAC

Blackboard offers support for RAC with all versions of Oracle supported by Blackboard. When using RAC with an OCI driver, a thin OCI driver must be used during upgrade. There is a known Java library issue when attempting to use a thick OCI driver. Using a thin OCI driver requires less configuration; however, in clustered environments a generic service name which corresponds to

the whole cluster cannot be used and instead the specific SID must be used for each node. For information about running Blackboard Learn with RAC, see [Oracle RAC Support on UNIX in Blackboard Help for Administrators](#).

Oracle 11gR2 Errors

Oracle 11gR2 contains two bugs that cause errors.

The first bug displays errors when importing content or restoring course packages. To prevent this error, as an Oracle user, run the following command:

```
alter system set "_optimizer_push_pred_cost_based"=false scope = both;
alter system set cursor_sharing=EXACT scope=both;
```

The second bug returns an error that reads:

```
ORA-00918: COLUMN AMBIGUOUSLY DEFINED Bug 9219636: ORA-00918: COLUMN
AMBIGUOUSLY DEFINED IN 11.2.0.1
```

To prevent this error, apply the Oracle patch bundle 11.2.0.1 number 9259407.

Hybrid Configurations

Red Hat/Solaris hybrid configurations have not been tested and are not supported.

SSL Configuration

Blackboard strongly recommends running the Secure Sockets Layer (SSL) protocol to secure communication between a Blackboard Learn Web/App server and a client machine. If SSL is not used, authentication may be compromised. For more information, see [About SSL and SSL Choice](#) in [Blackboard Help for Administrators](#).

Client Technologies

Windows Client Configurations

	Internet Explorer 8	Internet Explorer 7	Firefox 3.6	Firefox 3.5	Google Chrome
Windows XP (32-bit)	Compatible	Compatible	Compatible	Compatible	Unsupported
Windows Vista (32-bit)	Certified	Compatible	Certified	Compatible	Unsupported
Windows Vista (64-bit)	Compatible	Compatible	Compatible	Compatible	Unsupported
Windows 7 (32-bit)	Certified	Unsupported	Certified	Compatible	Unsupported
Windows 7 (64-bit)	Compatible	Unsupported	Compatible	Compatible	Unsupported

Mac OSX Client Configurations

	Safari 5.0	Safari 4.0	Firefox 3.6	Firefox 3.5	Google Chrome 10
Mac OS X 10.5 "Leopard"	Compatible	Compatible	Compatible	Compatible	Unsupported
Mac OS X 10.6 "Snow Leopard"	Certified	Compatible	Certified	Compatible	Unsupported

Accessibility and JAWS

Blackboard strives to make all its products as accessible as possible. JAWS for Windows 11 and 12 were used during accessibility testing for SP5.

JRE Support

Blackboard Learn requires the latest version of Sun JRE 6. The JRE can be downloaded from <http://www.oracle.com/technetwork/java/javase/downloads/index.html>. Windows System Administrators who want to provide auto-download for users can find the .cab file link for the appropriate JRE at <http://www.oracle.com/technetwork/java/javase/autodownload-140472.html>.

No Longer Supported

The following technologies are not supported:

- Internet Explorer 6
- Firefox 1.x, 2.0, 3.0
- Safari 2.0, 3.0, 3.1, 3.2 and any version on Windows
- Mac OS X 10.3, 10.4 "Tiger"
- Java 5, although it may continue to work

Internet Explorer 9 and Firefox 4.0

Microsoft Internet Explorer 9 and Mozilla Firefox 4.0 were not released with enough time to fully test on Release 9.1 Service Pack 5. These browsers are in Provisional Support. Please report any issues with these browsers to Client Support for consideration in a future release.

Virtualization

VMware® ESX Server 4 (Linux® and Windows®) is the only configuration Certified by Blackboard for Release 9.1.

Blackboard supports other virtualization solutions as long as Blackboard and the hypervisor support the guest operating system.

In addition to VMware, Blackboard has experience with Citrix XenServer 5.5, Solaris 10 Zones and Red Hat® Enterprise Linux® 4 & 5 Xen™.

Installation and Upgrade Information

For information about fresh installations of Blackboard Learn 9.1 SP5, see [Installation](#) in [Blackboard Help for Administrators](#).

For information about upgrading to Blackboard Learn Release 9.1 SP5, see the [Upgrade Center](#) or find the *Upgrade Kit* for your current version in the [Document Library](#).

Direct Upgrade Paths

The following releases can be upgraded directly to Blackboard Learn 9.1 SP5.

- Blackboard Learn Release 9.1 Service Pack 4 (Build 9.1.40071.3)
- Blackboard Learn Release 9.0 Service Pack 5 (Build 9.0.613.0)
- Blackboard Academic Suite Release 8.0 SP7 (Build 8.0.494.5)

Indirect Upgrade Paths

Previous Version	Suggested Path
9.1 GA, SP3 Build number 9.1.30151.0	<ol style="list-style-type: none"> 1. Upgrade to 9.1 SP4. 2. Upgrade to 9.1 SP5.
9.1 GA SP2	<ol style="list-style-type: none"> 1. Increment through the service packs to 9.1 SP4. 2. Upgrade to 9.1 SP5.
9.1 GA, SP1	<ol style="list-style-type: none"> 1. Increment through the service packs to 9.1 SP4. 2. Upgrade to 9.1 SP5.
9.0 GA, SP1, SP2, SP3, SP4	<ol style="list-style-type: none"> 1. Increment through the service packs to 9.0 SP5. 2. Upgrade to 9.1 SP5.
8.0 GA, SP1, SP2, SP3, SP4, SP5, and SP6	<ol style="list-style-type: none"> 1. Increment through the service packs to 8.0 SP7. 2. Upgrade to 9.1 SP5.
7.3 SP2	<ol style="list-style-type: none"> 1. Upgrade to 8.0 SP7. 2. Upgrade to 9.1 SP5.
7.3 SP1	<ol style="list-style-type: none"> 1. Upgrade to 7.3 SP2. 2. Upgrade to 8.0 SP7. 3. Upgrade to 9.1 SP5.
7.3 GA	<ol style="list-style-type: none"> 1. Upgrade to 7.3 SP1. 2. Upgrade to 7.3 SP2. 3. Upgrade to 8.0 SP7. 4. Upgrade to 9.1 SP5.
7.2 SP1	<ol style="list-style-type: none"> 1. Upgrade to 7.3 SP2. 2. Upgrade to 8.0 SP7. 3. Upgrade to 9.1 SP5.

Previous Version	Suggested Path
7.2 GA	<ol style="list-style-type: none"> 1. Upgrade to 7.2 SP1. 2. Upgrade to 7.3 SP2. 3. Upgrade to 8.0 SP7. 4. Upgrade to 9.1 SP5.
7.1 SP2 or later	<ol style="list-style-type: none"> 1. Upgrade to 7.3 GA. 2. Upgrade to 7.3 SP1. 3. Upgrade to 7.3 SP2. 4. Upgrade to 8.0 SP7. 5. Upgrade to 9.1 SP5.
7.1 GA and SP1	<ol style="list-style-type: none"> 1. Upgrade to 7.1 SP2. 2. Upgrade to 7.3 GA. 3. Upgrade to 7.3 SP1. 4. Upgrade to 7.3 SP2. 5. Upgrade to 8.0 SP7. 6. Upgrade to 9.1 SP5.
7.0.x	<ol style="list-style-type: none"> 1. Upgrade to 7.0 SP1. 2. Upgrade to 7.1 SP2. 3. Upgrade to 7.3 GA. 4. Upgrade to 7.3 SP1. 5. Upgrade to 7.3 SP2. 6. Upgrade to 8.0 SP7. 7. Upgrade to 9.1 SP5.
6.3.x	<ol style="list-style-type: none"> 1. Upgrade to 6.3 SP2. 2. Upgrade to 7.0 SP1. 3. Upgrade to 7.1 SP2. 4. Upgrade to 7.3 GA. 5. Upgrade to 7.3 SP1. 6. Upgrade to 7.3 SP2. 7. Upgrade to 8.0 SP7. 8. Upgrade to 9.1 SP5.

Paths for Importing and Restoring Courses

The following table identifies the supported paths for importing or restoring a Course that was exported or archived from Blackboard Academic Suite. Certified paths are fully tested and supported by Blackboard. Compatible paths are not fully tested but should function correctly based on past performance.

Note: 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.

Source	Support
Blackboard Learn Release 9.1	Certified
Blackboard Learn Release 9.0	Certified
Blackboard Academic Suite Release 8	Certified
Blackboard Academic Suite Release 7	Certified
Blackboard Academic Suite Release 6	Certified
Blackboard ML	Certified
Blackboard 5.5*	Certified
Blackboard 5.0*	Compatible
CourseInfo 4	Not Supported
Blackboard Vista and CE 8.0	Certified
Blackboard Campus Edition 4.1	Certified

*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.

Upgrading Server Software

Server software must meet certain requirements before installing Blackboard Learn. The following items 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. In a Windows environment, the appropriate client tools for the database must be installed on the Application server or servers when using a configuration with two or more servers. For Linux and Solaris configurations, the database client tools are shipped with the application and must not be installed separately.
- If running on Windows, when installing the Java SE Development Kit (JDK), make sure that both the JDK and the JRE components are installed to different locations. Also, ensure that there are no spaces in the path name to either the JDK or the JRE.
- If running on Windows, support for .NET APIs and .NET Building Blocks has been removed from Blackboard Learn in Release 9.1. If you are using .NET APIs and Building Blocks, they will not work in Release 9.1. Replace them with comparable Web Services and Java Building Block APIs. For more information about the available APIs, see the API documentation available on <http://www.edugarage.com>.
- If running on Solaris, ensure that the Swap space for the operating system is 0.5 – 1.5 times the amount of physical RAM on the server. For more information, see http://www.sun.com/bigadmin/content/submitted/swap_space_impact.jsp.

Before Running the Updater

Windows Server 2008 IIS 7 Roles and Features Configuration

Windows Server 2008 uses IIS 7. Before installation of Blackboard Learn 9.1, IIS 7 needs to be configured with specific Role Services and other settings.

1. Install the IIS 7 Role in Windows Server 2008 Server Manager and configure Role Services:
 - A. Click **Start** and select **Administrative Tools** then select **Server Manager**.
 - B. Click **Roles**, and under the **Roles Summary** heading, click **Add Roles**.
 - C. From the list of displayed roles, select **Web Server (IIS)**.
 - D. Click **Next**.

At a minimum, the following five (5) role services must be installed under Web Server (IIS) in addition to the default role services:

- Role Services > Web Server > Application Development > ISAPI Extensions
- Role Services > Web Server > Application Development > ISAPI Filters
- Role Services > Management Tools > IIS 6 Management Compatibility > IIS 6 Metabase Compatibility
- Role Services > Management Tools > IIS 6 Management Compatibility > IIS 6 WMI Compatibility
- Role Services > Management Tools > IIS 6 Management Compatibility > IIS 6 Scripting Tools

To enhance performance, troubleshooting, and offer additional web server configuration options, Blackboard recommends that the following role services also be installed under Web Server (IIS):

- Role Services > Web Server > Common HTTP Features > all five (5) role services enabled
- Role Services > Web Server > Application Development > all seven (7) role services enabled
- Role Services > Web Server > Security > all eight (8) role services enabled
- Role Services > Management Tools > all three (3) role services enabled
- Management Tools > IIS 6 Management Capabilities > all four (4) role services enabled.

Of the role services listed under Web Server (IIS) the following will be of the most interest:

- Role Services > Common HTTP Features > HTTP Redirection (to allow for HTTP redirection, in the event that the site is renamed)
- Role Services > Security > Windows Authentication (to allow for Active Directory integrated authentication)
- Role Services > Security > IP and Domain Restrictions (to allow for greater control of web server access)
- Role Services > Performance > Dynamic Content Compression (to allow for enhanced performance)

- E. Select **Windows Process Activation Service (.NET Environment)**, and then click **Add Required Role services**.
2. Disable the Default Web Site:
 - A. Click **Start** select **Administrative Tools** then select **Server Manager**.
 - B. From the left menu, click the plus sign next to **Roles** to expand the tree.
 - C. Click the plus sign next to **Web Server IIS**, and then click **Internet Information Services (IIS) Manager**.
 - D. Under the **Connections** heading, click plus sign next to the **%HOSTNAME%**, and then click the plus sign next to **Sites**.
 - E. Right-click **Default Web Site** and from the drop-down menu select **Manage Web Site**, then select **Stop**.
3. Back up the current IIS 7 configuration and verify.
 - A. `%windir%\system32\inetsrv\appcmd.exe add backup "Blackboard Pre-Change"`
 - B. `%windir%\system32\inetsrv\appcmd.exe list backup`
4. Modify the IIS 7 configuration to permit double escaping within URLs (applies to all sites).
 - A. `%windir%\system32\inetsrv\appcmd set config /section:system.webServer/Security/requestFiltering - allowDoubleEscaping:True`
5. Modify the IIS 7 configuration to allow upload files greater than 20MB in size, specified in bytes (applies to all sites).
 - A. `%windir%\system32\inetsrv\appcmd set config - section:requestFiltering - requestLimits.maxAllowedContentLength:104857600`
6. Back up the current IIS 7 configuration and verify.
 - A. `%windir%\system32\inetsrv\appcmd.exe add backup "Blackboard Post-Change Backup"`
 - B. `%windir%\system32\inetsrv\appcmd.exe list backup`
7. Restart the IIS service.
 - A. Click **Start** and select **Administrative Tools** then select **Server Manager**.
 - B. From the left menu, click the plus sign next to **Configuration** and then click **Services**.
 - C. From the list of services, right-click **World Wide Web Publishing Service** and select **Restart**.

IIS Configuration Editing Notes

Blackboard recommends that you do not manually edit the `%windir%\system32\inetsrv\config\applicationHost.config` file to configure these options. This will result in errors that require a backup and restore of the last known good backup of the IIS 7 configuration that was managed by the IIS.

If you manually backed up the `applicationHost.config` file, restoring this manual backup and restarting IIS 7 will not fix errors generated by manually editing this file to configure IIS 7.

By default, IIS 7 will check every two minutes for changes to the configuration files and will automatically create backups of them, maintaining a history of ten backups. Use the oldest of these backups to restore IIS 7 to a working state.

```
%windir%\system32\inetsrv\appcmd.exe list
backup%windir%\system32\inetsrv\appcmd.exe restore backup
"CFGHISTORY_0000000021"
```

Once the configuration has been restored and verified through web browser access, then use the `appcmd` utility to configure the necessary features of IIS 7 as described in the section above.

If this approach does not solve the problem with IIS 7 generating errors, remove and then reinstall the IIS 7 Role.

If you need to reinstall the IIS 7 Role, you can use the `%BLACKBOARD%\tools\admin\WebsiteReinstall.bat` command to re-establish the Blackboard Web site within IIS. Then install the IIS 7 Role in Windows Server 2008 Server Manager and configure Role Services.

Upgrading to Blackboard Learn 9.1 SP5

Upgrade Documentation

Blackboard provides Upgrade documentation for each of the following products in [Blackboard Help for Administrators](#):

- [Blackboard Learn Release 9.0](#)
- [Blackboard Academic Suite 8.0](#)
- [CE 4](#)
- [CE 8](#)
- [Vista 8](#)

Provide New License

Contact Blackboard Client Operations to [request a new license key](#) file (`bb-license.xml`) for Blackboard Learn Release 9.1. Make sure to do so well in advance of the upgrade. It is important to obtain a new license file to ensure the upgrade includes new features and functions.

Save the new license file in the same directory as the updater. Be sure not to confuse the new license with the old license file.

During the upgrade, when the installation prompt presents the following options: Update, Provide new License file, Uninstall Blackboard Learn, and Uninstall appserver, select **Provide new License file**.

Warnings

Running the Updater on an existing system will reset many back-end and user interface customizations. Examples and warnings describing specific known issues are included here.

Examples of affected back-end settings include:

- `JAVA_HOME` system environment variable
- SSL and custom authentication settings
- Settings in the `bb-config.properties`, `authentication.properties`, and `wrapper.conf` files

Examples of affected user interface settings and other affected areas include:

- Course Settings (which control the Course menu)
- Building Block availability
- API hosts information
- Module and Tab availability, role settings, and custom layouts

Customizations will need to be reapplied after the upgrade. To make this process easier, create a detailed document outlining all existing customizations.

Note Any configuration files removed by the upgrade will be placed in the `<blackboard_directory>/backups/<upgrade_timestamp>` directory. Use these files as a guide when updating the new configuration files to reapply your previous customizations.

Mashups and Firewall Warning

Bidirectional communication to Web Services that control the APIs for Mashups is required for running Mashup searches. If you are running Blackboard from behind a firewall as a test server or for security reasons, you will need to open the firewall to use this feature. To open bidirectional communication to Mashup Web Services, you must configure your firewall to allow responses from the API hosts. Information from the hosts is available at these locations:

Flickr – <http://www.flickr.com/services/api/>

YouTube – <http://gdata.youtube.com>

SlideShare – <http://www.slideshare.net>

Acxiom Warning

The IdentifyX Building Block is no longer bundled with Blackboard Learn. Clients who are upgrading from Blackboard Academic Suite 8.0 or Blackboard Learn 9.0 and then upgrade to Blackboard Learn SP5 must deactivate IdentifyX v1.1.3 prior to upgrading. After upgrading, download and install the newest version of IdentifyX, v1.1.6 available from [Blackboard Extensions](#). Clients that upgrade from a Learn 9.1 release are already using IdentifyX, v1.1.6.

New York Times Warning

New York Times content modules will no longer be bundled with Blackboard Learn Community Engagement.

SafeAssign Warning

Institutions choosing to archive courses from a legacy production installation and then restore the courses to a new 9.1 instance will lose some of the data associated with SafeAssign, specifically SafeAssignments in restored courses and the student submissions to those SafeAssignments will be inaccessible. In addition, this option could potentially create a privacy issue where some students would be able to see submissions that are not their own.

To avoid these issues, when SafeAssign is heavily used, Blackboard recommends that one of the other two upgrade paths be selected: In-Place Upgrade or Fresh Install – Data Migration.

If your institution chooses the archive/restore option, you will need to have the existing SafeAssign institution database copied from the previous installation to the new installation. Please open a ticket with Client Support to request this copy after the new production installation is complete.

Custom Themes Warning

Significant changes were made to the application markup and CSS in Release 9.1 to support new features and accessibility standards. These changes can cause customized themes and color palette changes created in earlier releases to malfunction as well as fail to apply styles to new features.

Comments have been added to the `CSS` files to make them easier to read and understand. These comments identify new elements and elements that are no longer used. Extraneous sectors have been removed.

Previous Content Management Clients Warning

If your institution is planning to upgrade directly from Blackboard Learn 9.0 or earlier please be aware of possible complications with Content Management. Clients who have previously licensed the Content Management module, but no longer have such a license, may encounter problems when upgrading to Release 9.1. This occurs because of lingering schemas in the database that require a Content Management license. Because of these lingering schemas, the installer is unable to upgrade the database properly and will fail.

If your institution's database has lingering schemas from a previous Content Management license you must obtain the appropriate uninstaller script from Blackboard Client Support to remove these schemas before upgrading to 9.1.

Load-Balanced Systems Warning

The Updater must be run on each Application server and the Collaboration server on a load-balanced system. After running the Updater the first time, choose the Update an App Server for all other Application servers and the Collaboration server. This option will upgrade the application files without making any of the database changes.

Language Pack Changes Warning

To ensure consistency across releases, the Blackboard Learn 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 upgrades to any custom Language Packs.

Running the Updater on Windows

Follow these steps to run the Updater on Windows:

1. Make sure that the `JAVA_HOME` system environment variable points to a full Java SDK, version 1.6.x. The path cannot contain spaces. For example: `C:\JDK6`.
2. Place the Updater file in the desired location, and then double-click the Updater file to launch the Updater.

A welcome message appears with a reminder to read the release notes and the installations instructions completely before updating.

3. Click **Next** to continue.
4. Confirm the installation and content directories for your environment, and then click **Next**. Load-balanced systems should use the correct UNC path for your content directory.

For those clients with Content Management and the `/courses` area turned off, a warning appears displaying a message that the `/courses` content area must be turned on to successfully upgrade. Although not recommended, the `/courses` area can be disabled again after upgrade, but it must remain on during upgrade.

5. At the next prompt, select **Provide new license file**, and then click **Next**.

6. If the server does not already have a **Server Type** value, the **Server Type** screen appears. Properly categorize the server and click **Next**.
7. When a message appears displaying the changes that will be made when the Updater runs, carefully verify the changes. You will not be able to undo the changes after you start the upgrade.
8. Click **Next** to start the upgrade.

 **WARNING!** If you launched the Updater from the command line, do not close the command line window or any of the other windows that pop-up during the upgrade as this will cause the Upgrade to fail and may leave the database in an indeterminate state.

Running the Updater on UNIX (Red Hat and Solaris)

Follow these steps to run the Updater on UNIX.

1. Place the Updater file in the desired location.
2. Open a command-line prompt as the root user and navigate to the directory that holds the Updater.
3. Issue the following command to launch the Updater:

```
$JAVA_HOME/bin/java -jar <updater_file>
```

If using the X Windows System (X11) or a similar GUI solution and the DISPLAY variable is properly configured, the Updater will launch in GUI mode.

Note: The following steps assume that the command-line Updater is used.

4. A welcome message appears with a reminder to read the release notes and the installations instructions completely before updating.
5. Press ENTER to continue. Instructions appear for navigating through the Updater prompts. The Updater, in most cases, will provide a default value in brackets.
6. Press ENTER to accept the default and continue, or enter a different value. Press ENTER to continue after entering a new value.

The first Updater prompt asks for the directory where Blackboard will be found.

7. Press ENTER to accept the default, or enter a new value and then press ENTER. If Blackboard Learn is not found in the directory provided, the Updater attempts to install at the given location.
8. At the next prompt, type 1 for “1 - Upgrade and Convert” and press ENTER.

For those clients with Content Management and the `/courses` area turned off, a warning appears displaying a message that the `/courses` content area must be turned on to successfully upgrade. Although not recommended, the `/courses` area can be disabled again after upgrade, but it must remain on during upgrade.

9. If the server does not already have a Server Type value, the Server Type screen appears. Properly categorize the server and press ENTER.

10. When a message appears displaying the changes that will be made when the Updater runs, carefully verify the changes. You will not be able to undo the changes after you start the upgrade.
11. Press ENTER to start the upgrade.