

## UNC LMS Test Environment and Testing Procedures

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The purpose of this document is to document the current environment and recommend procedures for evaluating and testing of new tools and new versions of the LMS.

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## Current UNC Blackboard Environment

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### **Managed Hosting**

UNC Blackboard courses are currently hosted using managed hosting services at Blackboard's data center. As a part of this service, Blackboard provides UNC:

- Technical and physical security of the Blackboard system
- Redundant technical architecture for high availability
- Backup and disaster recovery services
- Monitoring and notification services of the Blackboard system
- Data archiving and clean up services

### **Current Version**

UNC is currently running version 7.3 of Blackboard. In addition to the BB software, UNC has the following additional features/programs installed:

- Blackboard Sungard SCT Banner interface
- Building Blocks (from various vendors)

Advanced Group Management	Blackboard Scholar
CPS Connection	Disk Usage Report
EvaluationKIT Admin Tools	EvaluationKIT Institutional Access
ExpoLX	File Bridge Extension
GoogleModule	GoogleScholar
Health Check	Journal LX
Open Standards Content Player	Panopto Content Importer
Podcast LX	Pronto
Respondus Lock Down Browser	SafeAssign
Sign-up Tool	Teams LX
Wimba Classroom	Wimba Voice

### **Blackboard – Banner Interface**

An interface has been installed (BB Snapshot) to accomplish a link between the Banner system for registration and the Blackboard system. As a result of this, when students register for an online course in Banner, they are automatically added to the Blackboard shell for the course. In addition, at the end of the semester, grades entered into Blackboard are captured into the Banner system to become part of the students' permanent records.

The instructor information, listed in Banner, must be current in order for the Course Shell to be created accurately. Each department (University Scheduler) notifies the Registrar, which will update Banner. The Banner data is sent to Blackboard M-F at 11am and 4pm.

See "Course Process" flowchart of how data flows into Banner and Blackboard.

### ***IT – Blackboard Interface***

UNC Information Technology is responsible for interfacing with Blackboard regarding technical upgrades, maintenance and support issues for the production environment. IT utilizes Behind the Blackboard to interface with Blackboard for performance monitoring, upgrades, and break/fix types of activities.

### ***Implications for Maintenance***

UNC works closely with Blackboard to follow the UNC IT change management process. See Appendix A

### ***Implications for Service***

Some Blackboard support tickets that are submitted by UNC faculty, staff, and students involve issues or problems that cannot be resolved by the UNC Blackboard System Administrators.

Tickets are assigned 4 levels of service by the Blackboard Support Staff:

<b>Severity 1</b>	<p>Blackboard Production System is down. System is not functioning, system disabled or non-responsive.</p> <p>When a Severity 1 issue is reported, the Company will assign resources to remedy the error; if access to the Product is required, we ask that you provide access to your system and other software for the duration of the error correction procedures.</p>
<b>Severity 2</b>	<p>Blackboard Product is functioning, but major components are unavailable/unusable.</p> <p>When a Severity 2 issue is reported, the Company will assign resources to remedy the error; if access to the Product is required, we ask that you provide access to your system and other software for the duration of the error correction procedures.</p>
<b>Severity 3</b>	<p>Blackboard Product is operating close to normal; however minor components are functioning abnormally.</p> <p>Severity Code 3 implies that the Software is operating close to normal but there is a non-critical Software error. Severity Code 3 Software errors may be fixed in future software releases, including major releases, Application Packs, Services Packs or Hotfixes. Severity 1 and 2 Software errors will take priority over Severity 3 issues.</p>
<b>Severity 4</b>	<p>Product enhancement request or instructional assistance is needed</p> <p>Severity Code 4 implies that the Software is operating normally but you may be in need of instructional assistance or you are requesting functionality that is not currently included in the Software. Severity Code 1, 2, and 3 Software errors will take priority over Severity Code 4 cases.</p>

## UNC Blackboard Test Environment

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As a part of the Blackboard annual agreement, UNC has procured a testing and staging server license. This allows UNC to host on site two environments for UNC faculty and IT staff for testing purposes.

### **Test Server**

The purpose of the test server is to provide a system that faculty and Blackboard support staff can utilize to test major system changes and upgrades.

### **Staging Server**

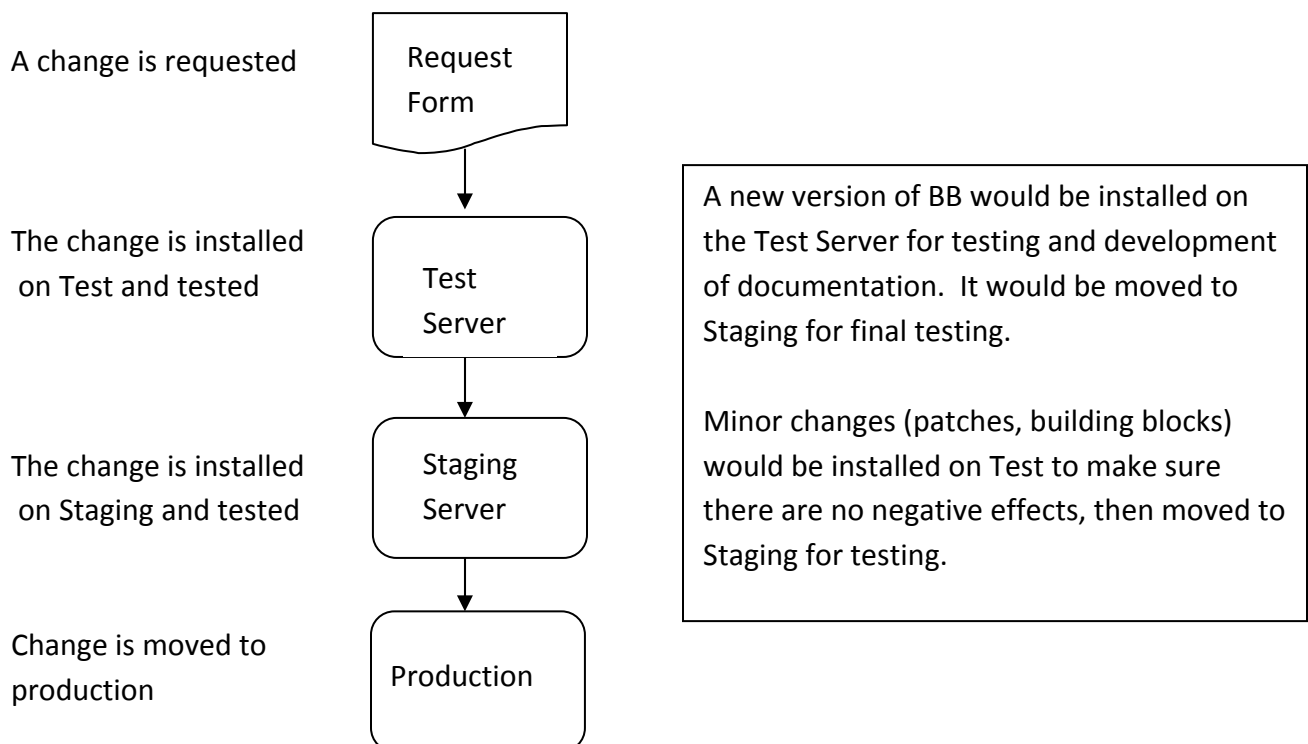
The purpose of the staging server is to provide a platform that mirrors the UNC production environment. The staging server can be used for quality assurance of approved patches, upgrades and building blocks.

The staging server resides at UNC in the IT department. This server replicates (as much as possible) the production environment for the hosted server at Blackboard including:

- Current release
- Same level of updates/patches applied
- Same building blocks installed

### **Conceptual Test Procedure**

The flow for all changes to the Blackboard Environment will be basically the same.



## Upgrade and Testing Procedures

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### **Definitions**

The following types of software are discussed in this section:

Patch/Hotfix	This represents minor system changes to Hardware and/or Software. There is no associated downtime. The user interface should not change significantly.
Building Blocks	Software modules that work with Blackboard to enhance the BB features.
Development Tools	Independent software programs that can be used to develop materials, interactive exercises, video, audio, quizzes or other content and assessment items for online courses. Development tools are often licensed to an individual computer.
Upgrade	This is a major system change to Hardware and/or Software. This could require significant downtime. The user interface could change significantly.

### **Patch/Hotfix Procedure**

Periodically BB notifies IT that there are patches or fixes to the system available. These are usually designed to fix a specific issue within the BB system and often do not affect the end user interface to BB.

The following process is used for these fixes:

1. IT receives notification of fix from the vendor.
2. IT reviews the fix to see if UNC has had any related problems.
3. IT installs the fix on test server to assess the installation process and impact on system.
4. IT installs the fix on staging server for testing.
5. The IDIT team tests the system as appropriate.
6. The IDIT team recommends a change order to apply the fix.
7. IT submits a ticket to BB to apply the fix to our production system.

Notes:

- The above process works within the existing context of the IT change management system (see Addendum).

### ***Building Block Procedure***

Building blocks are programs that can be added into the Blackboard system to provide additional features. The recommended flow for requesting, approving and adding building blocks to the UNC production system is:

1. Faculty or staff submits a request form indicating an interest in a feature. The form includes:
  - Rationale and potential use of feature
  - Cost of feature or “unknown”
2. The IDIT team reviews the form.
  - If there is a cost associated with the feature, the form will be escalated to the AVP of Continuing Education and Outreach and AVP of Information Technology for a decision about funding the feature if it is approved.
3. IDIT team researches the feature and makes a recommendation to proceed (or not) based on:
  - How the feature fits in with UNC’s overall goals for online learning
  - If the feature is unique or the instructional need can be met using an existing tool
  - The strength of recommendation/input from requestor
  - Quality of vendor support
  - Possible costs involved in use of the feature, both actual cost and implied cost
4. A formal request to install the Building Block on the test server is submitted to IT change management along with any necessary information (from above research).
5. The Building Block is installed by IT on test server.
6. If there are no negative effects on the system, the Building Block is moved to the Staging Server.
7. The Building Block is tested by IT and test group (can include IDD and faculty)
  - Faculty members who submit requests will be expected to participate in the testing to ascertain that the Building Block meets the instructional need
  - Standard forms are used for feedback on the Building Block from test group
  - Input is collected from IT on installation/maintenance/support issues
8. The Test group recommends purchase (or installation) using the following standard proposal format:
  - Rationale for purchasing product
  - Cost/benefit
  - Training plan (how the tool will be rolled out to faculty, plan for a pilot group)
  - Documentation plan (how tech support personnel will be trained and what documentation will be available to them to help them support the feature)

9. A decision about the Building Block is made:
  - The IDIT team is responsible for making the decision if no costs are involved or funding is already decided and there is no impact on the system.
  - The decision will be referred to the LMS Advisory Committee if:
    - Significant costs are involved
    - Significant downtime is involved
    - No funding decision was agreed upon
    - The IDIT team refers the decision to the LMSAG based on research and testing
10. If approved: IT requests installation of Building Block on UNC production environment using normal IT change management procedures.
11. If rejected: The rationale is documented and communicated back to the original requestor.

### ***Development Tool Procedure***

Development Tools are programs that can be used to create content for an online course. Typically development tools are individual licenses, so they would be funded by the individual department unless it is decided that a site license would be beneficial. Although departments could fund, install, and use these tools on their own, it is in the best interest of the University to participate in the research and testing of such products to avoid replication of tools and provide a set of “supported tools” for faculty.

1. Faculty or staff submits a request form indicating interest in a tool. The form includes:
  - Rationale and potential use of tool
  - Cost of tool if known
  - Prior experience with the tool
  - Whether the requesting department plans to purchase the tool for one person, the entire department, or wants to pursue making the tool a UNC standard.
2. The IDIT team researches the feature and makes a recommendation to proceed based on:
  - How the feature fits in with UNC’s overall goals for online learning
  - How well the tool integrates with the current LMS
  - If the tool is unique or the instructional need can be met using an existing tool
  - The strength of the recommendation/input from requestor
  - Possible costs involved in use of the tool, both actual cost and implied cost
  - Costs of individual, group, or site license
3. If the requestor wants to purchase an individual license, then he/she will be notified of the IDIT team’s research and support for the purchase.
4. If the requestor is suggesting this tool to be purchased with a site license or to become a UNC standard then the following will occur:
  - The request will be reviewed by the AVPs of IT and Continuing Education to resolve funding issues.
  - The IDIT team will arrange for a pilot of the tool.
  - Complete testing of the tool will occur, which may involve faculty volunteers. Testing will include:
    - Features and uses of the tool
    - Integration of the tool into BB courses  
(Ease of use for faculty, usability for students, impact on system resources)
    - Support requirements from both technical support and instructional designers
  - Active faculty users may be surveyed regarding potential use of the tool.
5. A recommendation will be made to the LMSAG to adopt the tool as a UNC standard.
6. If the tool is approved, IDIT will develop an implementation plan.

### ***Procedure for Evaluating a New Version of Blackboard***

Generally, UNC can expect one major release per year from Blackboard. Based on this, the following procedure defines testing and installing new releases.

### **Recommendation for Future Upgrades**

It is important from a support standpoint for UNC to try to stay no more than one version behind the current major release of Blackboard. However, it is also in the best interests of the University to take a conservative approach to upgrades to give the new releases time to be fully tested in the field and problems fixed prior to installation at UNC. New versions of Blackboard will be evaluated and tested thoroughly prior to installation.

### **Upgrade Timing Considerations**

To accomplish this goal, the University can look at a timeline in which the new version would be installed into production, after thorough testing, about 9 – 12 months after the release.

<b>Sample Schedule</b>				
October	October – December	December-April	May-July	August
New Release	Preliminary research, trial on BB site	Formal testing and faculty training	Migration of courses to Test Server, final faculty testing and training.  Possible pilot for Summer Session.	Production version ready for full installation

This is a general timeline, a detailed project plan will be developed at the start of the project.

### **Upgrade Decision Criteria**

Determining whether and when to upgrade involves many important considerations:

- Amount of disruption to courses
- Reliability, stability, and performance of the current system
- Results from testing upcoming version by university staff
- Bug reports from other university Blackboard installations
- Requested features available in the new version.
- Degree of change for faculty and students

Stability and performance are crucial to meeting the expectations of the university faculty, staff, and students. This means that there is a tendency to stay with the current version if it has adequate performance, is stable, and meets the significant needs of the university user community.

**Recommended Plan for Testing New Versions**

**Preliminary research, trial, and recommendation**

<b>Sample Schedule</b>				
October	October – December	December-April	May-July	August
New Release	Preliminary research, trial on BB site	Formal testing and faculty training	Migration of course to Test Server, final faculty testing and training.  Possible pilot for Summer Session.	Production version ready for full installation

1. Preliminary testing and research is done using vendor test site to determine if UNC should consider the new version. (See Upgrade Decision Criteria).
2. A Summary Report and Recommendation is published and presented to the LMS Advisory Committee for approval. If approved, the full test procedure will be implemented.

## Formal testing and Faculty training

Sample Schedule				
October	October – December	December-April	May-July	August
New Release	Preliminary research, trial on BB site	Formal testing and faculty training	Migration of course to Test Server, final faculty testing and training. Possible pilot for Summer Session.	Production version ready for full installation

1. A detailed project plan for the test is developed.
2. IT works with BB to set up the UNC test server with the new version.
3. Instructional Designers and BB support personnel access the test version for development of scenarios/test checklists/training documentation. (See preliminary test checklists in Addendum).
4. A team of testers is chosen including:
  - a. Instructional Designers
  - b. Faculty Testers
  - c. IT System Admin
  - d. Students
5. Selected TSC personnel are trained on the new system and documentation is provided on new and changed features. These support personnel receive tickets from test team and respond.
6. Faculty testers are trained on the new system and given checklists/scenarios to perform as they set up a new course.
  - a. Faculty testers can set up their own new course using a checklist, or use a sample course. The checklist tests both old and new features.  
(Note: Checklists may differ for different faculty members based on experience.)
  - b. Instructions for using changed and new features will be provided along with training.
3. Selected courses from the faculty testers' portfolios will be migrated to the new version and faculty will utilize a checklist that outlines features to be tested on an existing course.
4. Features that do not work are reported regularly via TSC via a special type of ticket.
  - a. IT works with Blackboard to resolve any issues
  - b. Fixes are applied using standard IT change management procedures
  - c. Fixes are communicated to the test team
5. Checklist feedback is collected and reviewed and outstanding tickets to Blackboard are reviewed.

6. A recommendation to upgrade production system is submitted to LMS Advisory committee along with:
  - a. Overview of testing results
  - b. Training plan for existing faculty
  - c. Course migration strategy
  - d. Recommended implementation date
7. Advisory committee discusses and approves or rejects recommendation.

## Migration of Courses, Faculty Training, Possible Pilot

Sample Schedule				
October	October – December	December-April	May-July	August
New Release	Preliminary research, trial on BB site	Formal testing and faculty training	Migration of courses to Test Server, final faculty testing and training.  Possible pilot for Summer Session.	Production version ready for full installation

1. Courses are migrated to the new version.
2. Final training is completed.
  - a. Online course/resources on the new version are made available to faculty along with face to face sessions
3. IT works with BB to install new version and migrate courses to production system.

## ***Recommended Plan for Evaluating/Comparing Learning Management Systems***

### **Decision Criteria for Evaluating Alternate LMS's**

UNC would consider evaluating an alternate LMS if the following conditions arise:

- The current LMS becomes unreliable, unstable, or has significant performance problems. This can be ascertained by downtime figures along with input from a yearly faculty satisfaction survey.
- Results from testing the upcoming version by university staff reveal significant issues with the new version from an instructional, technical, or performance standpoint.
- New LMS software is released that appears to have significant functional, instructional, and cost advantages to the current system.

### **Procedure for Evaluating Alternate LMS's**

The following general procedure for evaluating alternate LMS is recommended:

1. A task force with members from IT, CETL, IDD, and faculty is appointed to guide the evaluation.
2. The task force utilizes the EduTools software to compare various LMS products and make a recommendation for three systems to be evaluated.
3. IT works with the vendors to design a platform for UNC to evaluate each system.
4. A team of testers is chosen to include:
  - Instructional designers
  - Faculty testers
  - IT personnel
  - Students
5. Testing occurs using a checklist/evaluation sheet (part of the EduTools program) that outlines features to be evaluated relative to setting up a new course:
  - Testers will be provided with a scenario (sample course) and all course components and asked to create the course.
  - Checklist assumes a level of knowledge of Learning Management Systems, but documentation on each system will be provided as well.
6. The Evaluation team prepares a recommendation that includes advantages, disadvantages, costs, challenges, resource impact of all systems and submits to LMS Advisory Committee.
7. LMS Advisory Committee makes a recommendation to ITC.