

Developing an Interoperable Blackboard Proxy Tool

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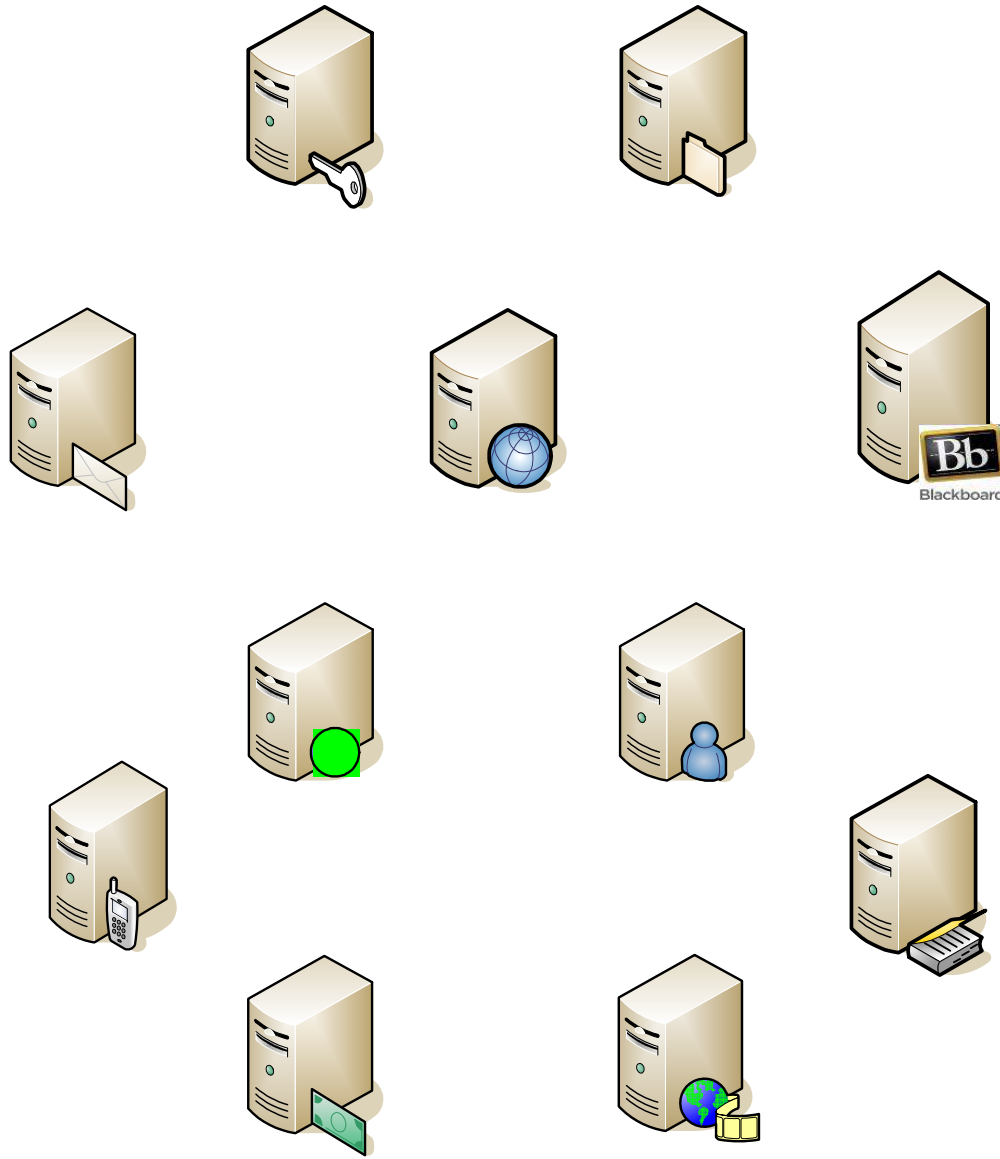
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Agenda

- Building Blocks – Proxy Tools Overview
- Design Approach
- Architecture & APIs
- Demo

Institutional Architecture



Learning Environment

Authentication

Content/media

Learning applications

Mobile access/alerts

Portal

E-mail/webmail

Registration

Bursar/payment

Library

Blackboard Learn® Platform

Course
Delivery

Community
Engagement

Content
Management

Portfolio
Management

Outcomes
Assessment

Advanced Tools

Lecture
Support

Virtual
Collaboration

Content
Authoring

Discipline-specific

Pedagogical
support

Simulations &
models

Course-specific

Plugins and App Frameworks

- **Portability**
 - Ability to reuse/repurpose across many platforms
- **Architecture**
 - Where does the app run?
 - Plugged-in vs linked-together
- Security, scalability, reliability
- Advantages and disadvantages
- Other implications



Container/Runtime

Local

Remote

Easy

Java Webapps
JSR-168/286 Portlets
W3 Standard Widgets

Google iGadgets
Open Social
IMS LTI Apps

Portability

Difficult

Blackboard Building Blocks
Moodle Plugins
Sakai Tools
Apple iPhone Apps
WordPress Plugins
Drupal Modules
Confluence Plugins

Facebook Apps



@BbWorld

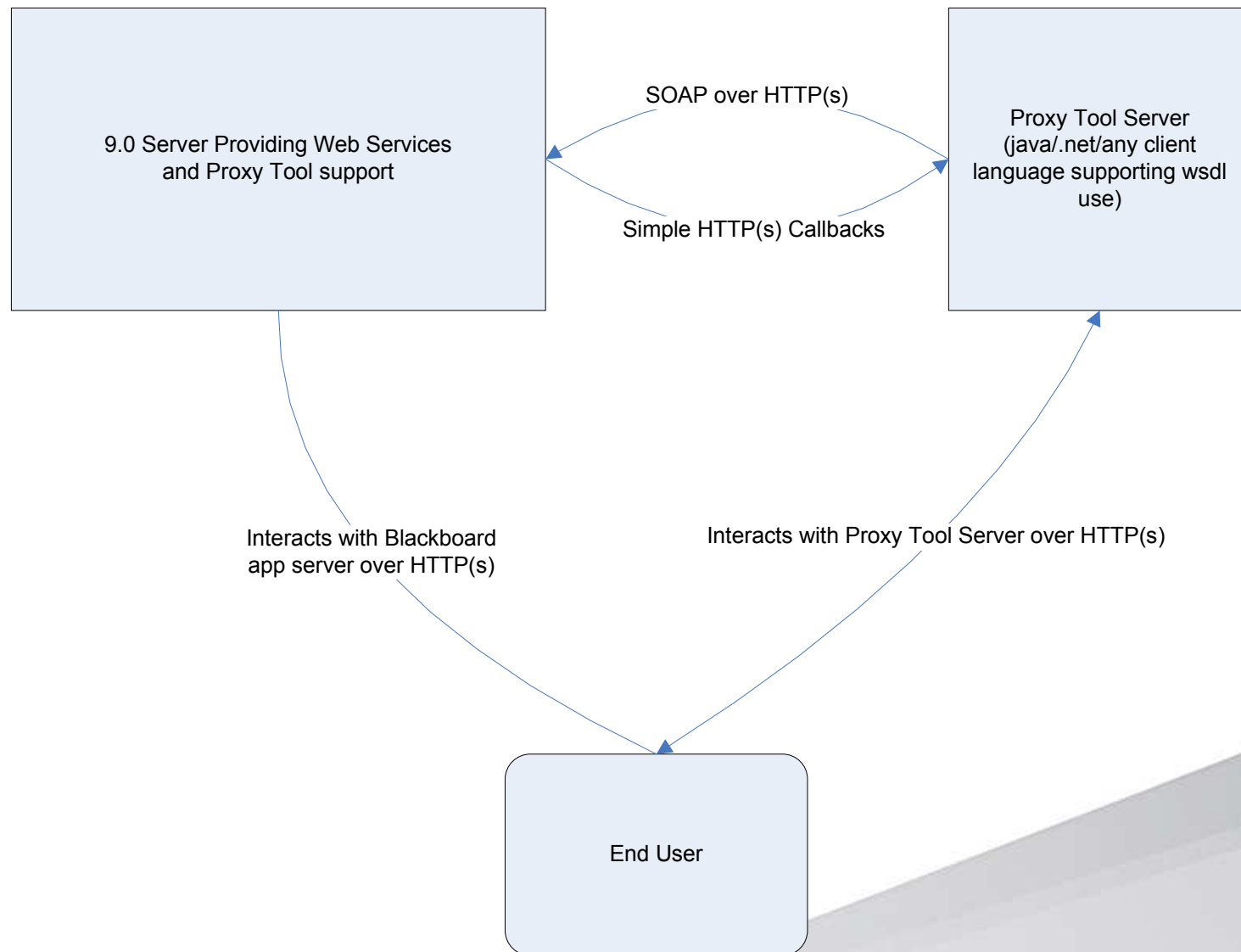
IMS Learning Tools Interoperability

- Subsequent version of IMS Tools Interoperability 1.0 addressing many of the issues surrounding TI 1.0
- Lance Neumann co-chairs the IMS working group
- Write your learning app once, run it anywhere (ideally)
- Choose the application technology of your choice (Java, .NET, PHP, The Cloud)
- Single tool can be connected to multiple LMSs
- Reduced development, support costs
- Protection from poorly written plugins

Proxy Tools

- What are they?
 - A new extension to the Blackboard Building Block Framework, LTI standards alignment when possible
 - Programs that interact with Release 9 but run outside the Release 9 JVM
 - Two types: Either with or without 'Placements' (entry points)
 - Can self-register if the administrator permits
 - Can be written in any language that can utilize WSDL based web services

Proxy Tools



Proxy Tool Motivations

- Building Block alternative to support better integration of external, third party applications or tools
 - Standard integration, SSO, and communication model
 - Standard Web Services
- Building Block alternative for a lower barrier to adoption from administrators (lower operational risk to production systems)
- Support both locally hosted and centrally hosted applications, with heterogeneous technology stacks
- Support a very similar set of use cases and entry points to Blackboard Building Blocks (placements)
- Succeeds CE/Vista capabilities with open standards

Proxy Tool Framework

- Self-registering Proxy Tools with or without placements (registerTool Web Service method)
- Without Placements: Essentially means a standalone client application utilizing web services
- With Placements: Proxy Tool server provides configuration of access points within the Learning Management System
- Callbacks methods for certain events in Blackboard environment (simple HTTP API)

Proxy Tool Types

- Why have them without placements?
 - To provide client applications that can interact with the users data in NG without using a web interface
- Why have them with placements?
 - To provide a Building Block –Installed Tool - style extension to the Release 9 interface without deploying any custom code on the Release 9 server itself

Proxy Tool Global Properties

Cancel

Submit

1 Proxy Tool Registration Password

Optional password to restrict access to the registerTool method. If specified then Proxy Tools that wish to register themselves must supply this password during the registration process. If left blank then any Proxy Tool may register itself. Note that the Proxy Tool will not be able to login as a tool until you give it a password on the Proxy Tool configuration page. A Proxy Tool will not be able to receive any entitlements until explicitly granted by giving the individual Proxy Tool its own password.

Proxy Tool Registration
Password

2 Allow Unknown Proxy Tools

If you allow unknown Proxy Tools, then Proxy Tools can connect and use user-based authentication to access Web Services. This still requires a password and restricts access based on the users entitlements within the system and is therefore secure, but can be done without explicitly granting them the right to use Web Services. If you do not allow this then only Proxy Tools that register themselves or that you manually add will be allowed.

Allow Unknown Proxy
Tools

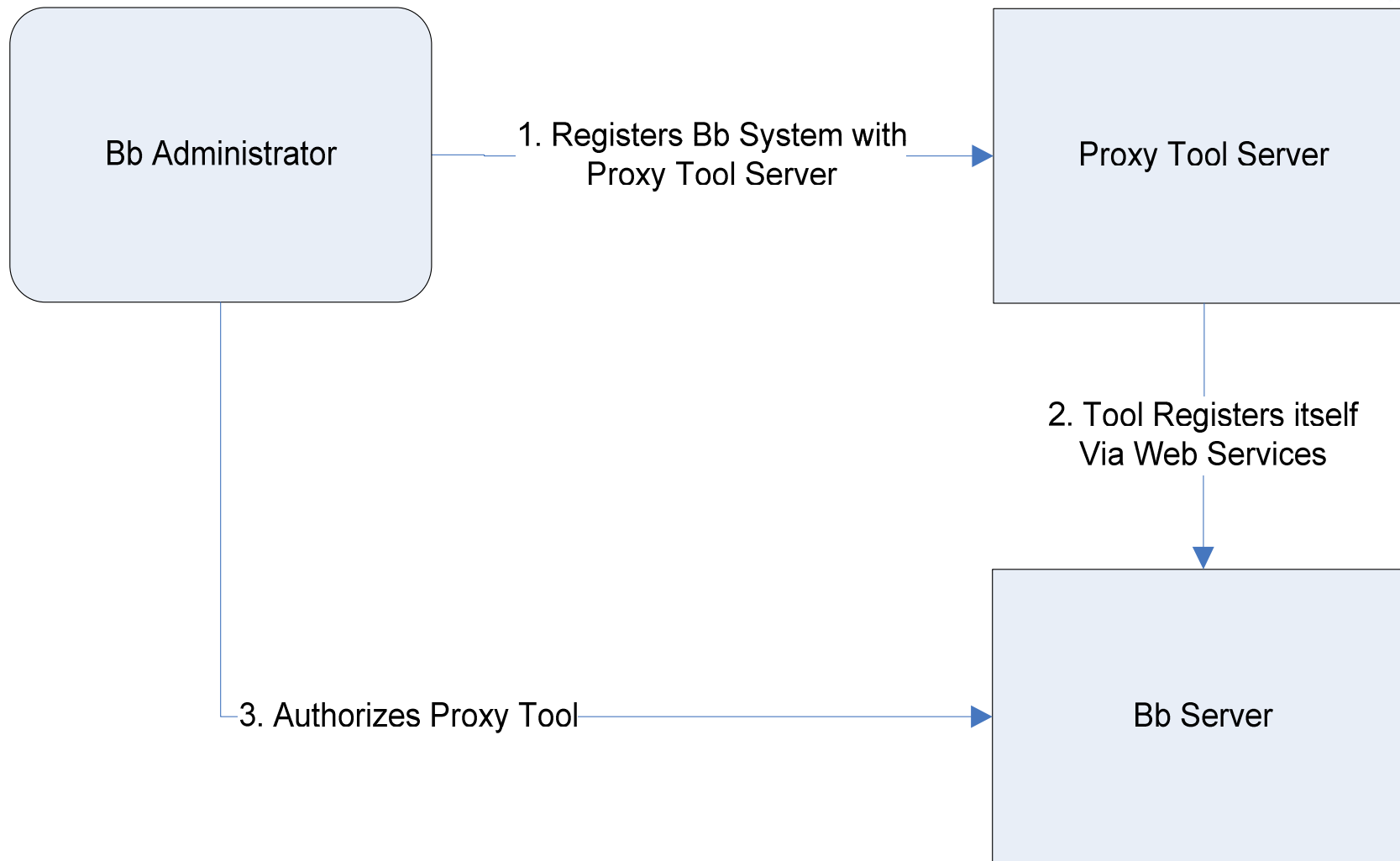


3 Submit

Cancel

Submit

Tool Registration Flow



Deployment Descriptor

- API registration, with a deployment descriptor
- Vendor and Tool information, high level metadata
 - Tool Version and description
 - Access URLs: http/https
 - Web Services Required
- Singleton actions+events
 - remote-configure action
 - course-copied/exported/imported events
- Content-handler actions+events
 - create/modify/view-content actions
 - content-copied/exported/imported events
- Specific link placements
 - course_tool, system_tool, etc.

Authorizing Proxy Tool

3 Proxy Tool Details

These are the details of Proxy Tool

Requested Web Services and availability	Context.WS - Web service is available Content.WS - Web service is available Gradebook.WS - Web service is available Util.WS - Web service is available
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Requested entitlements	admin.course.categorize.MODIFY webservices.tools.EMULATE : Allows a Proxy Tool to emulate another user for subsequent operations. webservices.tools.getMemberships.VIEW : Allows a Proxy Tool to call the getMemberships method for any user. course.gradebook.VIEW course.content.VIEW course.content.DELETE course.content.MODIFY course.content.CREATE
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Web APIs

- Context – get authenticated session
- Content
- Gradebook (subject to change)
- Util
- More to come

Proxy Tool Listing

Proxy Tools

[Set Global Properties](#)[Register Proxy Tool](#)[Download Sample Proxy Tools](#)

[Delete](#)

[Refresh Inventory](#) < Page 1 of 1 >

<input type="checkbox"/>	<u>Vendor</u>	<u>Program</u>	<u>Availability</u>	<u>Tool Authentication Configured</u>	<u>Tool Entitlements Requested</u>	<u>Proxy Placements Requested</u>
<input type="checkbox"/>	vendor	client	Available	No	No	No
<input type="checkbox"/>	bb	dotnet testclient	Available	No	Yes	No
<input type="checkbox"/>	bb	java testwebclient	Available	Yes	Yes	No
<input type="checkbox"/>	vendor	program	Available	Yes	Yes	No
<input type="checkbox"/>	Blackboard	Sample Proxy Server	Available	Yes	Yes	Yes
<input type="checkbox"/>	رئیس	ar2	Yes	Yes	Yes	Yes

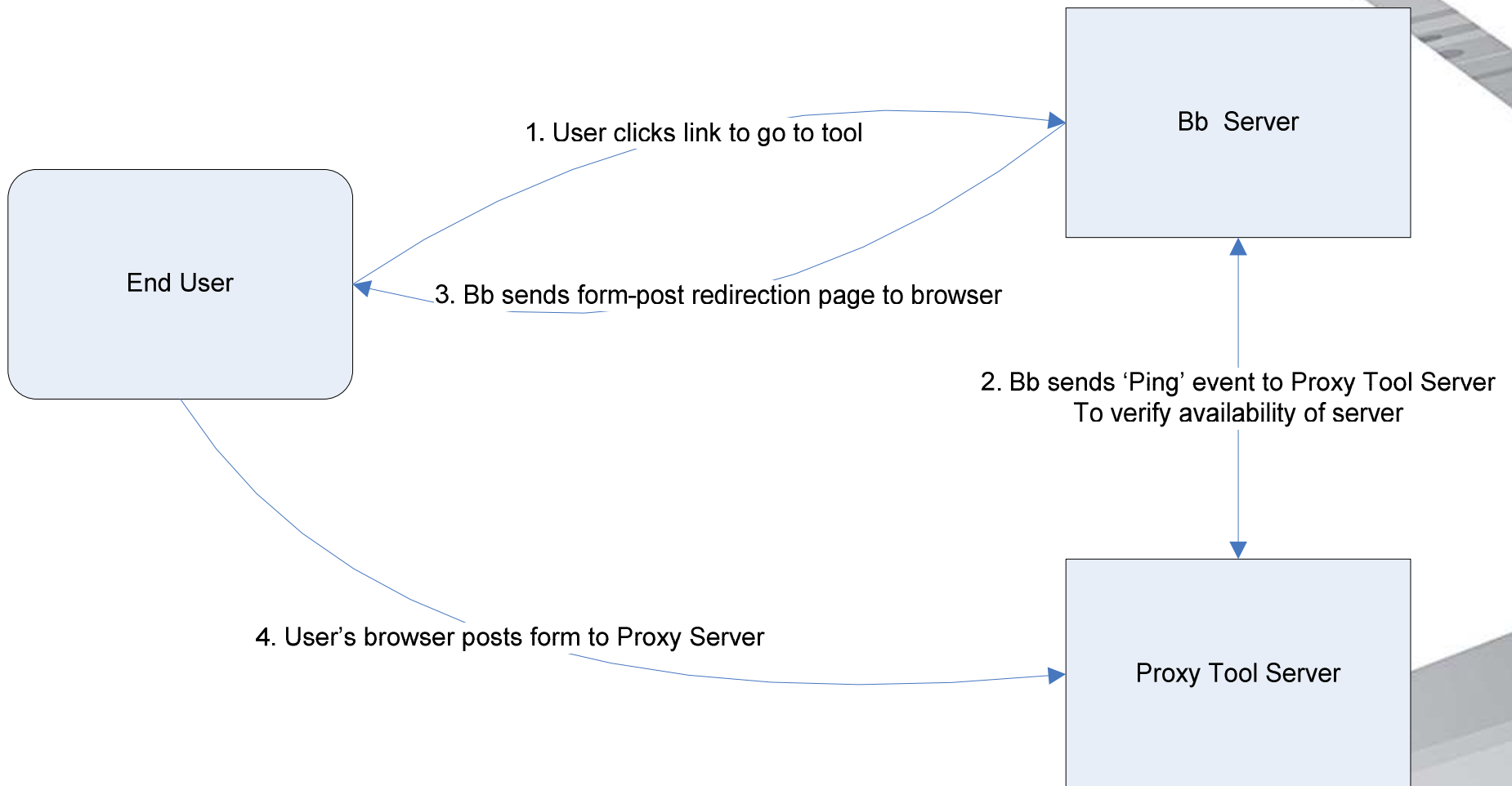
[Delete](#)

[Refresh Inventory](#) < Page 1 of 1 >

Total items: 18 [Show All](#) [Edit Paging...](#)

- > Properties
- > Remote Configure
- > Reregister
- > Delete

User accessing form flow



Comparison of Technologies

Installed Tools

- Custom code runs inside Blackboard Learn JVM
- Inherits look & feel of core application
- Supports multiple defined touch points plus additional application level definitions and portal module definitions
- Interacts with system data through all current direct access methods (APIs)
- Stores data on file system

Proxy Tools

- Custom code runs outside Blackboard Learn JVM
- Supports touch points at the course, system, user, and content levels.
- Interacts with system data through exposed Web Services
- Stores tool data externally

Demo time!



For more information, please contact:

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Visit: **<http://www.edugarage.com>**

