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together

Creating Dynamic Tools Using Template Variables and LTI

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#AT22

Introductions

Chris Bray

- University of Arkansas (Fayetteville)

- LMS Administrator since 1998

- LMS and Academic Technology Systems Architect

- 20th LMS Conference (WebCT, Blackboard, Anthology)

Introductions

## Mark Bykerk Kauffman, M.S. C.S.

- Anthology+Blackboard's Partner Software Engineer/ 7+ years

- Former Learn Admin & Dev @ CSU Chico

- Scientist/Engineer @ Hewlett-Packard

  - Report Generation System & Method, US Patent# 7031979

- Hobbies: Software, 6X marathons, Hiking & Gaming

Forward-Looking Statement

Statements regarding our product development initiatives, including new products and future product upgrades, updates or enhancements represent our current intentions, but may be modified, delayed or abandoned without prior notice and there is no assurance that such offerings, upgrades, updates or functionality will become available unless and until they have been made generally available to our customers.
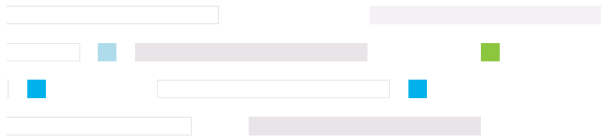
Discussion Items
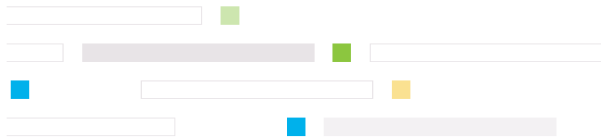
Older Technologies

- Template Variables
- launch_external.jsp
- Building Blocks

Modernizing Tools

- LTI - LaunchExternal
- NSSE links
- Other use cases

Time to Embrace Change

- Legacy tools are going away or already gone
  - Third-Party Building Blocks (B2's) after 2023
  - Older B2's broke with Java 11
  - launch_external.jsp removed in August 2021
- Replace these with "modern" APIs and standards
  - Learning Tools Interoperability® (LTI®)
  - Template variables (Original Courses only)

Template Variables

- Template variables are represented by a series of values given the special syntax: @X@object.attribute@X@.
- These variables are expanded when rendered into their corresponding values.
- Within the UI, they can be used in portal modules and within the body of content items in Original Experience courses.
- Examples:

    – User username (user id)   @X@user.id@X@   =   jsmith

    – User full name   @X@user.full_name@X@   =   John Smith

   *What's up @X@user.full_name@X@ ?* renders as

    yo

    What's up Chris Bray ?

launch_external.jsp (EOL in 3900.19)

- Used to create web links that were tracked in activity accumulator
  - https://learnserver/webapps/blackboard/launch_external.jsp?target=[url]

- Easy way to create simple single sign-on links within Learn
  - https://learnserver/webapps/blackboard/launch_external.jsp?target=https://support.uark.edu?userid=@X@user.id@X@ passes to https://support.uark.edu/?userid=**cbray**
 - https://learnserver/webapps/blackboard/launch_external.jsp?target=http://support.uark.edu/bbhelp?email=@X@user.id@X@@uark.edu?name=@X@user.full_name@X@ passes to https://support.uark.edu/bbhelp?email=**cbray@uark.edu**%3fname=**Chris%2520Bray**
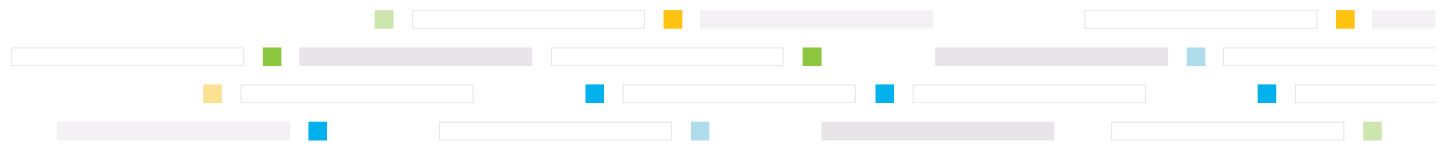
LaunchExternal LTI Tool

Topics

- Desktop Infrastructure
- Design & Code

Desktop Infrastructure

- Docker Desktop
  - https://www.docker.com/products/docker-desktop/
  - docker build -t launch-external:0.1 .
  - docker run -p 5000:5000 --rm --name LaunchExternal launch-external:0.1
    - Note: --rm
- ngrok
  - https://ngrok.com/
  - ngrok http -region=us -hostname=launchexternal.ngrok.io 5000
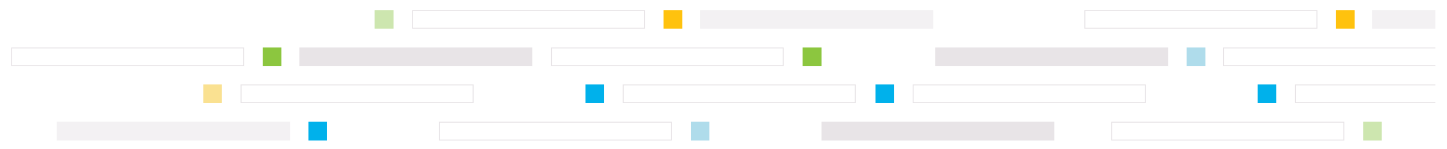
Design & Code

Design & Code

Design

- Flask

- LTI 1.3

- Course Content Managed Placement

- Template Variables

  - https://docs.blackboard.com/rest-apis/learn/advanced/dynamic-rendering-with-template-variables

- Custom Parameters

  - external_url=https://www.foodies.com?user%3D@X@user.id@X@

Code

- Shoulders of Giants

- LaunchExternal – JWKS

  - https://github.com/mark-b-kauffman/LaunchExternalJWKS

  - Mark Kauffman/Sebastian Silva

- BBDN-UEF-Python

  - https://github.com/blackboard/BBDN-UEF-Python

  - Scott Hurrey/Mark Kauffman

- PyLTI1p3

  - https://pypi.org/project/PyLTI1p3/

  - Dmitry Viskov

Code – Private Key, Public Key

- In the app directory you need to generate your tool's private.key and public.key files

  - openssl genrsa -out private.key 2048

  - openssl rsa -in private.key -pubout -out public.key

Code – lti.json

```json
{
    "https://blackboard.com": {
        "client_id": "b53987bc-1616-40dc-b962-0823c01c0490",
        "auth_login_url": "https://developer.blackboard.com/api/v1/gateway/oidcauth",
        "auth_token_url": "https://developer.blackboard.com/api/v1/gateway/oauth2/jwttoken",
        "key_set_url": "https://developer.blackboard.com/api/v1/management/applications/b53987bc-1616-40dc-b962-0823c01c0490/jwks.json",
        "key_set": null,
        "private_key_file": "private.key",
        "public_key_file": "public.key",
        "deployment_ids": ["0d611ee7-abd7-4d39-a9c0-c3ae2af19dbd", "6a21e21f-1eb7-40ed-9a46-5e0071f9bbe8"]
    }
}
```

Code – app.py

```python
@app.route('/launch/', methods=['HEAD','GET','POST'])
def launch():

    tool_conf = ToolConfJsonFile(get_lti_config_path())

    flask_request = FlaskRequest()

    launch_data_storage = get_launch_data_storage()

    message_launch = ExtendedFlaskMessageLaunch(flask_request, tool_conf, launch_data_storage=launch_data_storage)

    message_launch_data = message_launch.get_launch_data()


    external_url = message_launch_data['https://purl.imsglobal.org/spec/lti/claim/custom']['external_url'].rstrip('/')


    return render_template('external.html', launch_url=external_url)
```
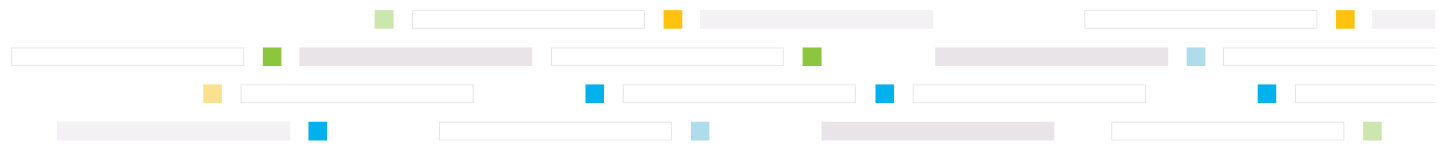
Code – external.html

```
<p>Welcome to LaunchExternal - Default Launch</p>
{% autoescape false %} Launching to
<a href="{{launch_url}}">{{launch_url}}</a> in a new window. Close it and
this panel when you are through or click the link if the page was not
automatically launched {% endautoescape %}
<!– set jinja template autoescape false to get exact URL-->
<script>

   {% autoescape false %}

   window.open("{{ launch_url }}");

   {% endautoescape %}
</script>
```

Using LaunchExternal

System Configuration

- Virtual Machine in VMWare Environment
    - WildCard DNS
    - WildCard SSL Certificate
    - NGINX
    - Docker
- Hosts LTI & Rest Tools, including
    - LaunchExternal
    - DSKTool
    - Collaborate to Kaltura LTI tool

LaunchExternal Tool

- Chat with Tech Support
- Sends users to a specific queue in our Bomgar Chat along with email and name.
- Had to Encode the URL to work
- external_url=https%3A%2F%2Fits.uark.edu%2Fhelp%2Fchat%2F%3Femail%3D%40X%40user.id%40X%40%40uark.edu%26name%3D%40X%40user.full_name%40X%40%26details%3DBlackboard%2520Learn%26queue%3Dteam_2

Dilemma

- Our campus participates in the National Survey of Student Engagement (NSSE)
- We're needing to assign unique URLs to nearly 11,000 students.
- The 2014 B2 by Brett Stephens quit working.
- Blackboard developers to the rescue!

  – LTI Enhancement - Additional User Template Variables: Institutional Email, Website, Other Name, and Title

  – These were unused fields in my Learn instance

Field	Display	Editable
Title	☐	☐
First Name	☑	☐
Middle Name	☑	☐
Last Name	☑	☐
Suffix	☑	☑
Other Name	☐	☐
Email	☑	☐
Student ID	☑	☐
Username	☑	☐
Website	☐	☐

Template Variables added in 3900.34

Context item	Context varible	Example output
User company	@X@user.company@X@	Anthology
User institution email	@X@user.email.institution_email@X@	John.smith@anthology.com
User other name	@X@user.name.other@X@	Johnie
User title	@X@user.name.title@X@	Dr.
User mobile phone	@X@user.mobile_phone@X@	0-123-456-7890
User website	@X@user.website@X@	https://smithjohn.anthology.com

Populate website url using SIS flat file

- "Website" field in *User* object

  - Header: webpage

  - Description: The URL of the user's personal Web page, if they have one.

    ```
    EXTERNAL_PERSON_KEY,WEBPAGE
    chris,https://nssesurvey.org/N8465C8E56/60
    cbray,https://nssesurvey.org/N5BE547434/60
    ```

NSSE using LaunchExternal

- Course Tool Placement
- Custom Parameters:

  – external_url=@X@user.website@X@

  – disable_interstitial=True
- Created a hierarchy node, allowing this tool ONLY in it, with the NSSE course
- Student clicks the tool link and is redirected to their unique survey link.

Resources

- Template Variables: https://docs.anthology.com/rest-apis/learn/advanced/dynamic-rendering-with-template-variables
- NSSE technical advice: https://nsse.indiana.edu/nsse/administering-nsse/recruitment-method/tech-advice-posting-survey-link.html
- LaunchExternal - https://github.com/mark-b-kauffman/LaunchExternalJWKS
- BS on Bb NSSE B2: http://bsblackboard.blogspot.com/2014/11/defining-custom-template-variables-in.html
- URL Encode Decode: https://www.url-encode-decode.com/
- Docker Desktop: https://www.docker.com/products/docker-desktop/
- ngrok: https://ngrok.com/
- Presentation posted at https://bbadmin.uark.edu/at22/