

A System for Resetting D2P Accounts

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ACS Tech. Note 2021-1 (Feb. 12, 2021)

Abstract

The ability to email users is a useful component for many systems. The mailer system is simple, quick, accessible from anywhere, easy to reference, and allows for instant access to information. It would be useful to the Declarative to Procedural 2 (D2P2) tutoring architecture, especially when the system sends a password reset link to the user. Once the mailer system is in-place and useable for resetting passwords, we will be able to build upon the mailer system and add other useful features for the D2P architecture. For example, we could use this module to remind users of progress via email or to inform users about a new research project that is currently recruiting new participants. In the first case, we will use it for resetting passwords.

Acknowledgements

D2P2 is developed with support from ONR and DHP projects (N00014-15-1-2275; DHP W81XWH-17-C-0002). Helpful comments from Frank Ritter and Jacob Oury in preparing and improving this document are gratefully acknowledged.

1. Introduction

The D2P2 is a cognitive tutor that uses the Declarative-to-Procedural learning theory (Kim, Ritter, & Koubek, 2013). The D2P2 tutoring system is based on ACT-R's theories of learning and memory (Anderson, 2007), and you can learn more about ACT-R in Ritter, Tehranchi, and Oury's (2019) review article.

The D2P2 system is getting many new users from a broader array of populations, particularly with the StopTheSpread.health site. With this new group that might be introduced to the D2P2 system via the StopTheSpread (STS) book or from the larger studies we are conducting, we have less direct interaction with the users, so the system needs to be more standalone with regard to logging in and accessing the material. One aspect of that is being able to reset their password. With most websites, resetting a password requires the system being able to send emails to users with password reset information. As users access the D2P2 system frequently for tutors over multiple sessions, users become more likely to have password issues that would force them to contact administrators to request a new password until this feature is implemented. In addition to this use case for a mailer system, other functionalities are also expected for future use.

Scenario

The user has forgotten their password but needs to access their account because their progress was saved to it. The user requests to reset their password, then an email with a resetting password link with a token is sent. The user accesses a page for resetting the password by clicking the link, and the new password will be saved in the database (DB). The account will not be affected unless the user resets the password. This is now a standard scenario.

Affected Applications

The proposed features would be added to all instances in the D2P2 tutoring architecture. These include:

1. The ACS primary D2P2 tutoring system that contains diverse tutors that provide platforms for various research project including the KRK (Theory of Skill Learning and Retention) project (acs.ist.psu.edu/d2p2/).
2. VITAMMINS is an isolated server based on the D2P2 architecture that trains trauma nursing assessment and interventions with Charles River Analytics (<http://vitamins.ist.psu.edu/>)
3. StopTheSpread is another isolated server that uses the D2P2 architecture that tutors how to protect from infection, especially COVID-19. This tutor has been published as a book as well. (<https://stopthespread.health/>)

2. Technical Status Report

The previous Research Assistants (RAs) worked on getting the mailer system into D2P2 architecture. Below is the summary of previous and current work.

1. On Feb. 16, 2017, an issue was raised regarding the mailing system with issue #41 on GitHub. The previous RAs [Korey MacDougall and Dan Guzek] worked on getting the mailer system to send a confirmation email when a user creates a new account. The RAs set up D2P2's execution of this action to be automatic so that no email is necessary, and the case was closed.
2. On Mar. 8, 2017, an issue was raised regarding the mailing system with issue #56 on GitHub. There was an issue with password reset. The issue was closed on Oct. 02, 2017, with the comment "closing-fixed")
3. On Sep. 06, 2017, a pull request for the reset password function was committed on GitHub by an RA with issue #189. According to the comment, the production environment uses the Simple Mail Transfer Protocol (SMTP) services of mail.com, with a dedicated 'd2p2@mail.com' address. The request was merged on Sep. 06, 2017.
4. On Sep. 06, 2017, issue #190 was raised that #189 fails with SMTP functionality. This case was closed on Sep. 08, 2017 with the comment, 'closing fixed enough for now'.
5. Now, we are working on the authentication credentials issue that blocks sending an email. We have discussed with PSU IT Desk regarding the issue. We are planning to make a change the application username and password to match with the PSU SMTP services. We are expecting this to resolve the problem.

3. System Design

The Penn State IT Desk specifies that we use a service ID for sending an email that ends with @address.psu.edu, where address is what we will pick. This information will be system dependent so that new tutors (e.g., at Quantico, or Cambridge) can have their own accounts.

Below are some suggestions for naming the mailer address and password based on IT Help Desk requirements¹.

¹ Notes from IT help desk saying we have to use their email address ending for service ID: email@desired_address.psu.edu such as email@acs.ist.psu.edu or email@d2p.psu.edu

Possible email addresses:

1. acslab-passwordreset@d2p.psu.edu
2. d2p-passwordreset@d2p.psu.edu (preferred by FER)
3. d2p-noreply@d2p.psu.edu (seems rude)
4. d2p-noreply@acs.ist.psu.edu (seems rude)
5. d2ptutor-unmonitored@d2p.psu.edu (still rude)
6. acslab-pwreset@d2p.psu.edu (second choice)

Password Requirements:

We will use a password that follows Penn State IST password complexity requirements.

Security

From the security perspective, we need an ability to send a secure email to a user containing a link that is accessible to the reset password page with a password token. The password token is randomly generated and is stored in the DB once the user clicks the reset password button. If the user accesses the password reset page with the password token that is matched with the generated password token, the system will allow the user to change the password. After that, the stored password token will be deleted from the DB, and the link that was sent via email for the reset password page will no longer be accessible anymore.

Authentication

We are not sure when the password reset functionality failed to work properly. Although the whole content of the email that is supposed to be sent to users is displayed in the log, the authentication credentials invalid error blocks sending the email from the application to the users. One assumption for this error is SMTP login failure due to wrong credentials account suspension. As issue #189 on GitHub mentioned, D2P2 used to get SMTP services of mail.com when it was built. The username and password in the application could be different from the SMTP login details because D2P2 has switched the mail service to a PSU server, and it could possibly cause an error. To solve this problem, we have discussed with the Penn State IT Desk the issue and decided to set up a username and password through Penn State IT Desk for the D2P email service account.

4. User Interface

The user will be able to reset their password from the log-in screen. An email will be sent through the mailer system with a password token that will be generated internally. Thus, unless the user accesses the link that is shown in the email, the password will not change. Here are the initial templates we will use.

Plain Text Password Reset Email Template:

From: Suggested email address@psu.edu
Reply-To: Suggested email address@psu.edu
To: <user email address>
Subject: D2P Reset password instructions

Hello user22@gmail.com!

Someone has requested a link to change your password. You can do this through the link below.

[Change my password](#) [this has a link]

If you didn't request this change, please ignore this email and forward it to Ritter or the person maintaining your tutor.

Your password won't change until you access the link above and create a new one.

Sincerely,
ACS D2P System

Password Reset Email Template with HTML formatting:

From: Suggested email address@psu.edu
Reply-To: Suggested email address@psu.edu
To: <user email address>
Subject: D2P Reset password instructions

<p>Hello user22@gmail.com!</p>

<p>Someone has requested a link to change your password. You can do this through the link below.</p>

<p>Change my password</p>

<p>If you didn't request this change, please ignore this email and forward it to Ritter or the person maintaining your tutor.</p>

<p>Your password won't change until you access the link above and create a new one.</p>

<p>Sincerely,</p>

<p>ACS D2P</p>

5. Conclusion

The ability to send emails to users is beneficial because it is simple and enables D2P2 to contact users directly, especially when the system sends a password reset link to the users. The system is on the stage of matching the application ID with the PSU SMTP service ID to get the correct credentials account. We are expecting the next step would be to check if the password reset functionality works well and verify it in the DB.

References

- Anderson, J. R. (2007). *How Can the Human Mind Occur in the Physical Universe?* Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780195324259.001.0001>
- Kim, J. W., Ritter, F. E., & Koubek, R. J. (2013). An integrated theory for improved skill acquisition and retention in the three stages of learning. *Theoretical Issues in Ergonomics Science*, 14(1), 22–37. <https://doi.org/10.1080/1464536X.2011.573008>
- Ritter, F. E., Tehranchi, F., & Oury, J. D. (2019). ACT□R: A cognitive architecture for modeling cognition. *Wiley Interdisciplinary Reviews: Cognitive Science*, 10(3), e1488. <https://doi.org/10.1002/wcs.1488>