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# Team Dijkstra

Crist – Howell – Ghodratnama

t14 – Defect Database  
Email Server/Client System

Software Engineering II  
Spring 2013

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*“Elegance is not a dispensable luxury but a quality that decides between success and failure”*

- Edsger Dijkstra

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## Defect Overview

The following is the defect database for our project. In our project we designated two types of defects. One is a local defect which affects only one developer. The other is a system wide defect. A system defect is one that affects multiple developers and needs to be solved before development continued. In our project we were fortunate enough have very few of these defects.

Having two types of defects, we needed to have a system of tracking defects when they arise. For a system wide defect. We used the Google Code Issue tracker included with our SVN repository. This allows a central location to where each developer can see each defect. The second type of defect is a local defect. These are normal defects that arise when a developer is coding and testing their piece of software. Since these defects are normally caught before they are committed to the SVN system, it is not necessary to alert the group to these issues. These issues should instead be logged in the developers personal PSP log.

## Defect Prevention

In order to have a successful implementation, we needed to take several step to eliminate defects. The first step of defect prevention was the use of the modular structure outlined in this document. This allowed each module to be developed independently from each other. This allowed only one program to be written to execute each action as needed. This also allowed us to keep IO and logic files separate. By doing this, generating theorems and test for the logic was less complicated since we enforced the requirements of having no dependencies in the ACL2 logic portions of the modules.

The next step in defect prevention was the use of ACL2 theorems to verify that the output of our logic functions, in fact, were correct. The theorem structure outlined in the *Testing* section allowed us to provide a logically sound proof that the functions we defined generated the guaranteed output. This guaranteed output along with strict XML DTD's provided assurance that no stray data is going to be sent to or from the server.


The final step we took was careful planning and design of the modules. Since we designed this program modularly, we knew that once a module is completed, it would continue to work regardless of the progress made on other modules. This careful design and constant planning for of the program allowed all developers to be on the same page as the development process began. Constant updates to the design were inevitable but rarely deviated from the initial modular concept of the application.

## System Wide Defect Database

Below is the log of issues recorded into the system wide defect database.

4/15/13 Issue 1 - spring-2013-se2-dijkstra - Email I/O - Team Dijkstra SE2 Project (ACL2 Email Service) - Google Project Hosting  
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**spring-2013-se2-dijkstra**  
Team Dijkstra SE2 Project (ACL2 Email Service)

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★ **Issue 1: Email I/O** 1 of 3 [Next](#) [Back to list](#)

1 person starred this issue and may be notified of changes.

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**Status:** Fixed

**Owner:** [wesleyrhowell](#)

**Closed:** Feb 28

**Type:** Defect

**Priority:** Medium

**Component:** Logic

[Add a comment and make changes below](#)

Project Member Reported by [wesleyrhowell](#), Feb 22, 2013

I wrote the Email I/O in Dr. Racket and it works from this environment. However, when I try to admit and load the module into ACL2, it is failing.

I still need to tie up a few ends on things and hope this solve the issues.

---

Project Member [#1 wesleyrhowell](#)

Feb 23, 2013 [Delete comment](#)

I have gotten everything I/O related to admit, However the functions that rely on the I/O functions are still having trouble admitting to ACL2. It seems that all the functions will work independently but not as a whole as needed.

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Project Member [#2 matthew.a.crist](#)

Feb 26, 2013 [Delete comment](#)

Suggested that Wesley utilize the shell in order to provide input for the acl2 script and to dynamically generate that information. Naming convention for storage also discussed for clarification on multiple email messages existing in the same directory (persistent storage directory).

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Project Member [#3 matthew.a.crist](#)

Feb 27, 2013 [Delete comment](#)

Code review is under way. Actionable execution must occur within a subdirectory of the module structure. Will check for correctness.

**Status:** Started

**Owner:** matthew.a.crist

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Project Member [#4 matthew.a.crist](#)

Feb 27, 2013 [Delete comment](#)

IO should not occur within the server-email.lisp file. This file should be dedicated to the logic of parsing the information contained within the data structure for the email subsystem. IO should occur in a subsection of the module such as ./modules/email/send-email/ which can contain the send-email.lisp and send-email.sh files that act upon the logic contained in server-email.lisp. Removed redundancies from the SVN. Ensure that these files are removed from subversioning to prevent unnecessary commits to the repository. io-utilities.lisp and list-utilities.lisp should be referenced in a relative context as opposed to absolute. Updated references withing server-email.lisp. Testing should occur in a separate file that includes this book instead of directly within the file itself. Consider removal of excessive code. I have left it in there for you to update upon completion.

**Labels:** Component-Logic

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Project Member [#5 wesleyrhowell](#)

Feb 28, 2013 [Delete comment](#)

Matthew and I have discussed the changes that need to be made. I am working on this now and should be finished shortly

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Issue 1 - spring-2013-se2-dijkstra - Email I/O - Team Dijkstra SE2 Project (ACL2 Email Service) - Google Project Hosting

**Status:** Fixed**Owner:** wesleyhowell

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Issue 2 - spring-2013-se2-dijkstra - Email through NC - Team Dijkstra SE2 Project (ACL2 Email Service) - Google Project Hosting

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## ★ Issue 2: Email through NC

1 person starred this issue and may be notified of changes.

[Prev](#) 2 of 3 [Next](#)[Back to list](#)**Status:** Fixed**Owner:** [matthew.a.crist](#)**Closed:** Apr 1**Type:** Defect**Priority:** High[Add a comment and make changes below](#)**Project Member** Reported by [matthew.a.crist](#), Mar 22, 2013**What steps will reproduce the problem?**

1. Start server via "bash start\_server.sh" in server root directory.
2. Attempt to transmit email XML data via NC to port 20006.
3. Review the results in the store folders for email.

**What is the expected output? What do you see instead?**

The expected output is to have an email placed into that folder with the data that was present from the XML you transferred through NC. Instead, no file shows up at the current point in time. Attempted fix with user registration by ensuring the folders exist. Need to add a mail daemon to forward to the senders email instead to ensure the user knows that the email could not be sent properly. Also need to verify that the user exists in the address book before sending an email with user credentials as to implement security measures for email processing.

**Project Member** [#1 matthew.a.crist](#)Apr 1, 2013 [Delete comment](#)

It was determined that the nc command through UNIX did not provide sufficient information which required more overhead than the effort warranted. We decided to switch from shell scripting to Java standalone applications which proved to resolve several corner case issues that plagued the project.

**Status:** Fixed

### Add a comment and make changes

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4/15/13 Issue 3 - spring-2013-se2-dijkstra - User Register (Same User Multiple Passwords - Team Dijkstra SE2 Project (ACL2 Email Service) - Google Project H...

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★ **Issue 3: User Register (Same User Multiple Passwords)** [Prev](#) 3 of 3  
1 person starred this issue and may be notified of changes. [Back to list](#)

Status: Accepted

Owner: [matthew.a.crist](#)

Type-Defect

Priority-Medium

[Add a comment and  
make changes below](#)

Project Member Reported by [matthew.a.crist](#), Apr 1, 2013

What steps will reproduce the problem?

1. Register a user with same name, domain, different password
2. Repeat step 1 with a new password
3. Look at address-book.xml on the server

What is the expected output? What do you see instead?

The registration process creates two of the same user with two different passwords. This can be resolved via the lisp data, but I am placing it as a bug so that I may fix it at a later date.

Add a comment and make changes

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## Local Defect Database

The following is the individual defect database from each developers logs.

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PSP Report

### Defect Log - Matthew A. Crist

Date	Phase	Fix Time	Description
Jan 18, 2013	Networking	60	IP resolution cannot occur in ACL2 unless a network drive is mapped, after which you can call it by its network path. Networking drives may be our resolution to this issue.
Jan 29, 2013	Conception	150	ACL2 cannot work with a GUI and IO at the same time. Had to reevaluate how to salvage what we had regarding design. Instead of real time chat, we would be sending email. Instead of ACL2 interfaces, we would program them in C or C++.
Jan 31, 2013	Application Support	90	Unable to get Proofpad to work correctly on any of my computers. Windows 8 and Ubuntu both show NullPointerExceptions when trying to implement ACL2 and Proofpad will not correctly identify with ACL2. Opted to use Dracula instead.
Feb 3, 2013	Conception	150	Determined that the size of the executables generated by ACL2 would not be a practical application for our program. Opted to use input redirection into ACL2 prompt and shell script invocation. Ubuntu would be the server platform and the two Macs would be used as clients to send and receive information.
Feb 5, 2013	Personnel	15	With the loss of Isaac from the team, modules had to be prioritized for completion and new due dates had to be set. Determined that I would need to finish the XML Parser as quickly as possible to begin development in order to maintain deadlines.
			Made the decision to allow shell scripts to take care of much of the IO on the read side as possible and file operations would need to be done by the OS in order to keep correct RWE privs on the file for security purposes.



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Feb 15, 2013	Coding	10	CHMOD properties will need to be determined at a different date, since access to store files has not been completely determined. Best guess is that server will be the only one that needs read/write access to these files and no user group will need execution access.
Feb 19, 2013	Coding	20	Issue arose when parsing XML tokens that the whitespace in the document was being identified by
March 4, 2013	Personnel	45	Has to reconsider a new "plan of action" with regards to completion of the project. Current methods seemed to archaic for the current situation as we were unable to adapt due to the reliance on people. Opted for a RAD development solution where SCRUM and Extreme Programming were the foundations for development. Will need to explicitly sit down and speak with team to describe the course of action. Developed a visual aid to describe where we are and what is completed. There seems to be more questions on this as opposed to the completion of the project.
March 13, 2013	Coding	20	Was not able to get email to write to the server. Determine that it was an issue that the directories did not exist, thus the information was not being written properly by the ACL2 script, which was a difficult thing to determine since acquiring error information from the runtime environment would only be possible if we wrote the error to an output log. Determined that I would need to finish the registration process by adding directory creation to the shell script in order to make this function correctly. Until then, we can manually create the directories.
March 23, 2013	Coding	35	Type checking for string-listp on XML conversion in the server actions was incorrect. Was using endp and stringp tests, when combined I could use string-listp, which ended up being the

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PSP Report

			required fix and not having to turn off guard checking.
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PSP Report

**Defect Log - Wesley R. Howell**

Date	Phase	Fix Time	Description
Jan 22, 2013	Design	60	Found out that networking is not feasible from within ACL2. To make it natively supported, writing and extending several Common Lisp features would need to be done. We cannot do this in the scope of this project. So we found that using the Operating System's native filesystem and networking support would be much more friendly to deal with once we get to this stage in the project.
Jan 29, 2013	Design	147	Found out that GUI's and File IO cannot coexist in ACL2. We can have one or the other, but not both. So we had to scrap the GUI portions of the project and replace them with a new idea. The new idea is the current design of the email server and client system. This project is strictly data processing and file IO. This project will be file and text based rather than Visual and Interactive.
Feb 5, 2013	Design	124	We discovered that generating ALC2 executables and invoking these files from an outside source is a troublesome experience and that the generated files are hundreds of megabytes in size. Since we will have several modules for this project, we saw this as a negative side effect of executable files. To solve this problem, we moved all our project to the UNIX platform. This has allowed us to use the UNIX shell environment to generate shell scripts that invoke the ACL2 environment while passing in ACL2 source code files. This reduces the size of the files to kilobytes and streamlines the execution process and eliminating the size of outside programming needed for the original idea to work. Thus we will be executing our ACL2 code through a UNIX shell script and the shell scripts

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PSP Report

			will in turn be executed from the outside programming environment.
Feb 12, 2013	Design	75	When we looked at the design review. We saw several errors in the XML format that would not pass if it were to be sent through a web browser. We had to work on setting the XML to a correct format and modify the document type definitions to comply with proper XML syntax.
Feb 22, 2013	Coding	12	After finishing coding the ACL2 functions, the functions would not admit under normal ACL2 invocation. However, it did work under Dr Racket. The issue was traced to the IO and List utilities files as they were un-certified files within the regular ACL2 environment. Adding the suppression to the certification requirement, the files worked as usual.
Feb 23, 2013	Coding	52	After fixing the certification issue. Certain functions were still not admitting to ACL2. This was due to illegal arguments as the ACL2 output stated. To fix these arguments, the state variable had to be set and implemented differently than I had intended. I added some safe guards to the variables and added constraints to the functions that depended on them.
March 5, 2013	Coding	21	After finishing the IO entry point function on the server email module, We noticed that the XML files were being generated with a comma instead of the @ symbol between names and domains in the email address. Also, the output file for the email was a statically named file. This file needed to be dynamically named with a timestamp.
March 11, 2013	Coding	24	Email parsing had a one off error that did not have the correct lines returned for the XML file which rendered the outputted file useless.
			Shell script was not correctly splitting the XML files based on the regular expression. Started using awk to parse

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March 14, 2013	Coding	32	the file. However, the file did not have a unique file name and was getting overwritten every time the script was executed.
March 24, 2013	Testing	16	The theorem that tested the email data structure was not passing. This was traced to an error in the proof and not in the code. The error was trying to access an item that was not in the structure, hence the failure of the proof.
April 1, 2013	Coding	23	Working on integrating the ALC2 with Java. Having trouble getting Java to see the files that ACL2 has generated. Right now, the current solution is to make the Java sleep for a couple of seconds while ACL2 finishes its processing then resume. Then it sees the files that ALC2 generates
April 2, 2013	Testing	15	The script that Matthew had written to open all files in a directory was not working. It was needed that the function open only the xml files, since there are hidden files in a directory, I had to modify the function to account for these changes.

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PSP Report

**Defect Log - Adam Ghodratnama**

Date	Phase	Fix Time	Description
March 27, 2013	Design	0	Need to restructure the create-mailing-list.lisp file to handle multiple addresses and multiple owners.