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Assignment (Infomatik-Vertiefung) for Thomas Hunziker

Task Description: Hanspeter Kunz, Martin Waldburger, Prof. Dr. Burkhard Stiller

Title: **Design and Implementation of a Webclient to Access a CalDav Server**

Start Date: October 3, 2011

End Date: December 31, 2011

Supervisor: Hanspeter Kunz, Martin Waldburger, Prof. Dr. Burkhard Stiller

Location: Department of Informatics (IFI), students' room

Support: CalDav, DAViCAL, E-mail protocols, LDAP, Roundcube

1. Introduction and Motivation

DAViCal is a calendar server suited to store personal and shared calendars. It is an open source implementation of the CalDav protocol, which has been designed for storing calendar resources on a remote server, similarly as the IMAP protocol does for e-mail.

There are a lot of client applications that allow a user to interact with CalDav servers, such as the Mozilla Calendar/Mail, Evolution, Mulberry or Apple's iCal. Most of these applications also allow users to access their e-mail, thus, providing a combined interface for e-mail communication and scheduling of tasks and meetings.

However, to access mail and calendars from arbitrary computers, it is often much more convenient to use browser-based interfaces instead of native applications. Roundcube is such a browser-based mail application (for webmail). It is multi-lingual, supports multiple identities and multiple address books (using databases or LDAP-directories as storage). As it is open source and conforming to standards, roundcube is usable with any IMAP server. Through its plugin-API, roundcube is easily extensible. Many plugins have already been developed, e.g., to manage sieve mail filtering rules. Roundcube has been used for several years at the Department of Informatics (IFI) at the University of Zurich.

For CalDav, there exist a few browser-based solutions. However, they are either part of larger groupware solutions (such as open eXchange or Horde), they are not free (Atmail Cal-Dav client), read-only (PHP iCalendar), or not maintained anymore (Webical).



To enable the IFI's webmail users to access not only their e-mail but also their calendars from arbitrary computers, it has been decided, to develop a roundcube plugin, that allows the access of personal and shared calendars directly from roundcube. With this the IFI will be able to provide its users with a browser-based solution, that combines e-mail communication and scheduling of tasks and meetings.

2. Description of Work

This assignment consists of a number of key contributions to be made. First, the student should familiarize him or herself with the necessary tools that are already available. The state-of-the-art and related work shall be documented. This includes — in terms of a non-concluding list — the roundcube plugin API, the CalDav protocol and the DAViCal server. As a second important step, it is necessary to review the solutions that have already been implemented. This includes, in particular, the following:

- The web-based CalDav client that comes with DAViCal
- Previous roundcube plugins for calendaring, that have been implemented, but provide either only GoogleCalendar access or are not maintained anymore.
- AgenDAV, a stand-alone browser-based calendar client, which is based on FullCalendar, a jQuery plugin.

For each piece of related work considered, a decision shall be taken (and well documented) about what parts may be used for this assignment directly, which parts may be used in adapted form, and what needs to be designed and implemented from scratch. Based on this review, the system design shall be determined and documented clearly, covering the key design decisions taken in terms of by using which tools/techniques a roundcube plugin for calendaring is best implemented, in terms of flexibility, maintainability and usability. Finally, such a calendar plugin is to be implemented, tested, and the implementation and evaluation results have to be documented.

3. Thesis Goals

The main goal of this work is the implementation of a working webclient to access a CalDav server. The webclient will be implemented as a roundcube plugin and provides the necessary functions that allow users to perform the following actions:

- To add, edit, and remove appointments.
- To schedule meetings. This includes inviting participants through CalDav directly on the server or indirectly by e-mail and displaying of busy/free times of the participants.
- To accept and reject meeting invitations.
- Automatic discovery of accessible calendars.
- Creation, deletion, and renaming of calendars.
- Configuration of calendars, e.g., setting access rights, colors.
- The user interface should be intuitive to use, e.g., supporting double-clicking to edit appointments, re-scheduling appointments by drag-and-drop.

4. Activities

Based on the description of work the following activities—some in parallel—are recommended:

- Study the CalDav standard as well as other relevant technology needed and develop a detailed concept of the required data structures, data flows and processes
- Study the roundcube plugin architecture and develop a detailed concept of the implementation of the webclient.
- Implement the features described under "Goals" in a step-by-step fashion, including testing the implemented features continuously.

- A strong focus of the implementation is security. All user input has to be validated, sensitive information has to be sent over encrypted channels.
- An essential part of the work is the documentation of all architectural decisions concerning the implementation and the documentation of the code. The documentation has to be sufficiently detailed, such that people not previously involved in the project are able to understand the code and can continue working on it.

5. General Notes

- The student has to provide a written schedule for his/her full thesis steps within the first two weeks of his/her work. Clarify details with your supervisor and finalize the schedule of tasks, basically in a weekly fashion. Include the final presentation, too.
- At the assignment's end (date to be set) a final public and self-containing presentation (20 min max plus Q&A) has to be given.
- Establish periodic meetings with the supervisor to report on progress and to discuss problems.
- Students involved in this thesis are required to read and answer e-mails related to this project at least three times a week. A more frequent, if needed, interaction will determine a better basis for supervision and progress.
- The information sheet on important hints for thesis work is required to be known.

6. Formal Results

Besides the final oral presentation of your work the following written documents are part of your work and need to be handed in to the supervisor in time:

- A report in a soft cover binding and in 3 copies (in English, preferred): It covers the problem to be solved, the discussion of the design choices, a set of arguments on the final design choice, a list of solved and open issues, a table of content and figures (including tables), a valid list of bibliographic references, and optional appendices as required. A critical consideration of the task, the assignment, and the result will conclude the report. The official acknowledgement section is mandatory, a personal one optional, however recommended, as usually a number of people took part in the process of finalizing the thesis. The text processing shall be done in FrameMaker (preferred).
- The student can choose between writing a report as outlined just here above or taking an oral exam of approximately 25 minutes about all topics covered in and besides this assignment. The oral exam starts with a 20 min presentation of the candidate, where the slide set has to be handed in, including annotations and remarks in comments fields, seven days prior to the exam date to be set.
- A dedicated CD has to be produced: (1) a collection of all related work papers in PDF or full HTML pages and a directory description; (2) the written thesis (report) in source files, figures in source file and gif or eps, and a full printable PS as well as PDF file, the set of slides for the final presentation in PowerPoint, and all further material used, if available in electronic form, such as all existing and documented scenarios, plans, and results.
- A German (or English, in case of a German report) summary of maximum 1 page, which will enable a quick and clear survey of this assignment's tasks and results. This summary will be part of the bound report, and is included after the front page and before any other text will follow. It includes content-wise four areas of concern: introduction, aims and goals, results, and further work.
- The complete set of copies of the report, the CD, and the talk must be completed and handed in to the supervisor in time before the assignment will change into "submitted" status. After that a date

of the oral exam will be fixed between the responsible professor and the candidate. One of the supervisors should be part of the oral exam as well.