

CalDAV



CalDAV FOSDEM 2009

Helge Hess
primadonna@helgehess.eu

Agenda

- Introduction
- Motivational Flame
- Protocol Overview
- Implementations - Overview
- How to write a CalDAV Connector
- How you can help, what do we need?
- Where to ask ... and Q&A



Introduction

- HTTP / WebDAV based protocol
- describes how an calendar client (like Sunbird, Evolution, etc) can talk to a calendar server (iCal, eGroupware, etc)
- CalDAV is the transport, the data format is iCalendar and vCard for contacts (CardDAV)
- all OpenSource clients are based on iCal/vCard



Motivational FLAME

- “KDE bring Exchange compatibility”
- ***#!?!
- Standards 1st
- already do the hard stuff (iCal,vCard)!
- So please ...

COMPUTERWORLD
THE VOICE OF IT MANAGEMENT

IBM® STORAGE SOLUTIONS
Disk and tape combination to help you

Networking eBusiness Open Source Security Servers SW Dev Storage Unified Comms Mobility &

OpenChange, KDE bring Exchange compatibility to Linux

Open source Exchange server replacement only a year away

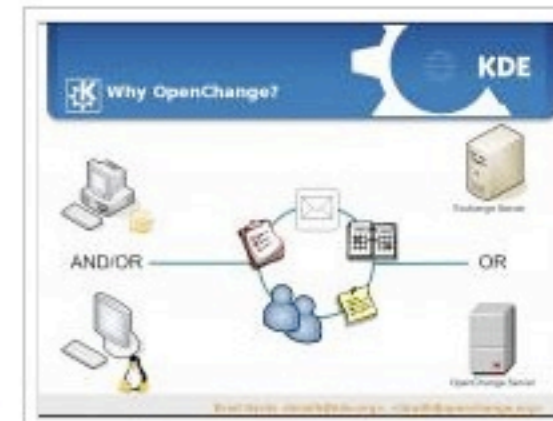
Rodney Gedda 30/01/2009 10:05:00

Page: 2 next >

Recent developments in the OpenChange and KDE open source projects are set to bridge a "missing link" in messaging and groupware compatibility from Microsoft's Exchange to open source clients.

Many open source groupware suites lay claim to this holy grail of interoperability, but the software to synchronise address book, task and calendar information with Exchange is sold as a proprietary extension.

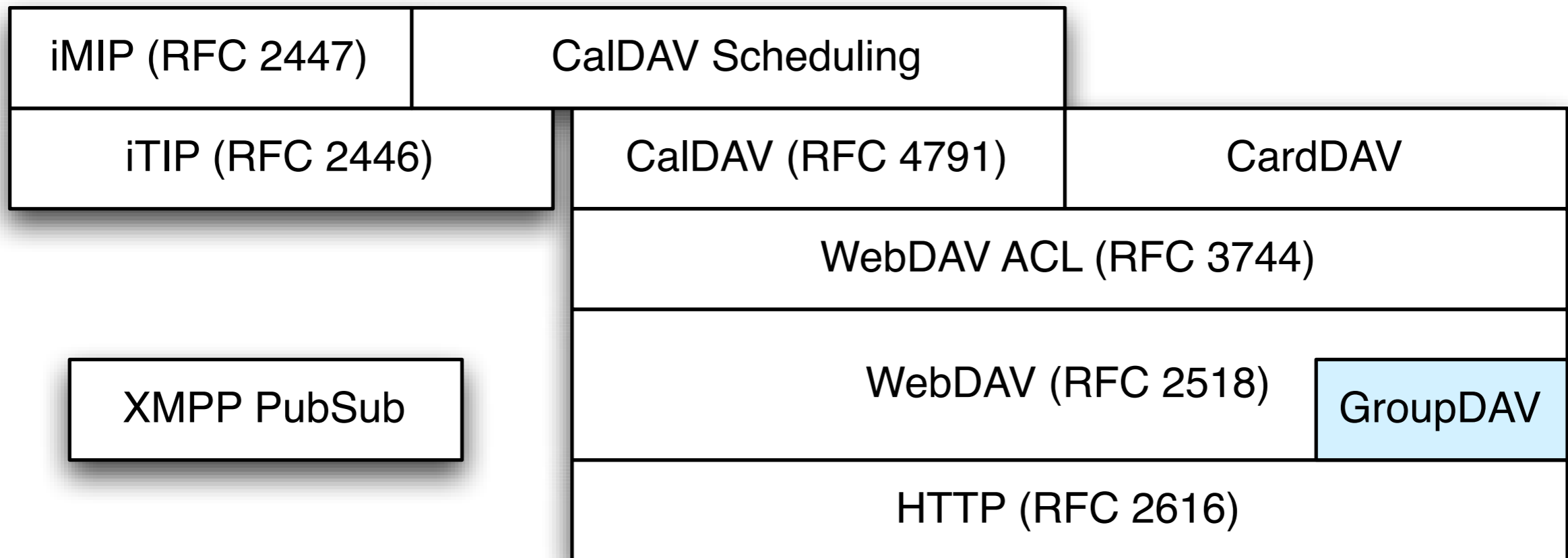
Speaking at the Linux.conf.au Linux and open source conference in Hobart last



CaIDAV

Protocol Overview

- the full stack, just don't be afraid ...
- ... / please implement just GroupDAV first ;-)
- every GroupDAV client can talk to a CalDAV server!



iCalendar

BEGIN:VCALENDAR

VERSION:2.0

PRODID:-//ZideOne//Z1Look//EN

CALSCALE:GREGORIAN

BEGIN:VEVENT

SEQUENCE:0

CREATED:20090109T175015Z

DTSTAMP:20090109T175015Z

UID:z1-20090109-175015-328-1

FBTYPE:FREE

SUMMARY:Hack-o-ton

DTSTART;VALUE=DATE:20090114

DTEND;VALUE=DATE:20090118

X-FUNAMBOL-ALLDAY:1

END:VEVENT

END:VCALENDAR



vCard

BEGIN:VCARD

VERSION:3.0

UID:929383-29392-389293-29392

N:Heß;Helge;;;

FN:Helge Heß

ORG:ZideOne;

EMAIL;type=INTERNET;type=**WORK**:helge.hess@zideone.com

EMAIL;type=INTERNET;type=**HOME**:helge.hess@opengroupware.org

EMAIL;type=INTERNET;type=**HOME**:helge5@gmail.com

EMAIL;type=INTERNET;type=**HOME**:me@helgehess.eu

TEL;type=**WORK**:+49-391-6623-120

TEL;type=**HOME**:+49-391-7338255

item2.**ADR;**type=**WORK**;type=pref:;;Unip. 12;Magdeburg;;39104;Germany

item2.**X-ABADR:**de

item3.**URL;**type=pref:[http\://www.helgehess.eu/](http://www.helgehess.eu/)

item3.**X-ABLabel:**_\$!<HomePage>!\$_

BDAY;value=date:19xx-**09-21** ←

X-AIM;type=**HOME**;type=pref:helje5

X-JABBER;type=**HOME**;type=pref:helje5@googlemail.com

END:VCARD

**Birthday
Presents
are
Welcome!**

HTTP/1.1 (RFC 2616)

- GET, retrieving items
- PUT, creating and changing items
- DELETE, deleting items
- REST
 - a lot of REST services should just use WebDAV protocols instead of own inventions ...

Retrieving an Item

```
GET /zidestore/dav/helge/public/Calendar/12200.ics HTTP/1.1
content-length: 0
Authorization: Basic aGVsZ2U6cnhyb290
if-none-match: 12200:1
```

```
HTTP/1.0 200 Ok
content-length: 678
etag: 12200:1
content-type: text/calendar; charset=utf-8
```

```
BEGIN:VCALENDAR
METHOD:REQUEST
PRODID:-//OpenGroupware.org/ZideStore 1.3//
VERSION:2.0
BEGIN:VEVENT
LOCATION:Karlsruhe
STATUS:CONFIRMED
SUMMARY:LinuxTag
DTEND:20050622T160000Z
DTSTART:20050622T070000Z
...
```



Changing an Item

```
PUT /zidestore/dav/helge/public/Calendar/12200.ics HTTP/1.1  
content-length: 678  
Authorization: Basic aGVsZ2U6cnhyb290  
if-match: 12200:1
```

```
BEGIN:VCALENDAR  
METHOD:REQUEST  
PRODID:-//OpenGroupware.org/ZideStore 1.3//  
VERSION:2.0  
BEGIN:VEVENT  
LOCATION:Karlsruhe  
STATUS:CONFIRMED  
SUMMARY:LinuxTag  
DTEND:20050622T160000Z  
DTSTART:20050622T070000Z  
...
```

```
HTTP/1.0 200 Ok  
etag: 12200:2  
content-length: 0
```



Creating an Item

```
PUT /zidestore/dav/helge/public/Calendar/meeting.ics HTTP/1.1  
content-length: 678  
Authorization: Basic aGVsZ2U6cnhyb290  
if-none-match: *
```

```
BEGIN:VCALENDAR  
METHOD:REQUEST  
PRODID:-//OpenGroupware.org/ZideStore 1.3//  
VERSION:2.0  
BEGIN:VEVENT  
LOCATION:Karlsruhe  
STATUS:CONFIRMED  
SUMMARY:LinuxTag  
DTEND:20050622T160000Z  
DTSTART:20050622T070000Z  
...
```

```
HTTP/1.0 201 Created  
etag: 12800:1  
location: /zidestore/dav/helge/public/Calendar/12800.ics  
content-length: 0
```



Deleting an Item

```
DELETE /zidestore/dav/helge/public/Calendar/12200.ics HTTP/1.1
```

```
content-length: 0
```

```
Authorization: Basic aGVsZ2U6cnhyb290
```

```
if-match: 12200:1
```

```
HTTP/1.0 200 OK
```

```
content-length: 0
```

WebDAV (RFC 2518)

- Hierarchies of Collections
 - /developers/
 - /developers/calendar/
 - /developers/tasks/
- Metadata for HTTP resources 'Properties'
- PROPFIND, retrieve properties and hierarchies
- Other useless stuff, like LOCK ;-)

Listing Collection Items

```
PROPFIND /zidestore/dav/helge/public/Calendar HTTP/1.1
content-length: 98
Authorization: Basic aGVsZ2U6cnhyb290
```

```
<?xml version="1.0" encoding="utf-8"?>
<propfind xmlns="DAV:"><prop><getetag/></prop></propfind>
```

```
HTTP/1.1 207 Multi-Status
content-length: 6815
content-type: text/xml; charset="utf-8"
```

```
<?xml version="1.0" encoding="utf-8"?>
<D:multistatus xmlns:D="DAV:">
<D:response>
  <D:href>/zidestore/dav/helge/public/Calendar/225810.ics</D:href>
  <D:propstat><D:prop>
    <D:getetag>225810:1</D:getetag>
  </D:prop>
  <D:status>HTTP/1.1 200 OK</D:status></D:propstat>
</D:response>
```

WebDAV ACL (RFC 3744)

- principal resources (users, groups, rooms)
- flexible permissions (permission properties)
- for CalDAV implementors, principals:
 - /principals/users/helge
 - /principals/groups/dev
- can be used to find calendars (calendar-home-set)
 - implement that as an option, browse as primary

CalDAV (RFC 4791)

- requires WebDAV, WebDAV ACL, iCalendar, etc ...
- one additional HTTP method: REPORT
- the actual report request is in the body
- only thing really important for client developers:
 - multiget REPORT, to retrieve in batches
 - PLEASE: always fallback to multi-GET on 500/501
- other reports, mostly to support web interfaces

CardDAV (draft)

- same thing like CalDAV, except for contacts
- currently an RFC draft, will become an official RFC

GroupDAV Protocol Details

- Stay compatible with WebDAV but do not require it
- Only WebDAV used: A single PROPFIND query
- GET, PUT, DELETE - regular HTTP/1.1
- E-Tags - regular HTTP/1.1
- Content Types: vCard, iCalendar
- Folder Discovery - Collection Types
- Support Apache mod_dav

GroupDAV

- For offline clients only (online => CalDAV or internal)
- No over-designed “perfect” protocol, a pragmatic one
- OpenSource clients
- OpenSource servers
- Trivial implementation
- Majority of the projects is database based

CalDAV Scheduling

- used to schedule meetings
- like iMIP (email), just over HTTP
- please get GroupDAV/CalDAV right, before looking into this ... really.

Scalability

- Highly scalable due to offline approach
- Out-of-the-box support for Proxy Caches (Squid)
- Good tradeoff between TCP connection reuse ...
- ... and TCP connection overload (stateless HTTP)
- transparent SSL/TLS and transparent compression
- XML Overhead (Number of Items / Raw / GZipped):
- 1,000 items / 227K / 12K - 10,000 / 2.3MB / 130K

Extensions

- Darwin / Apple Calendar Server as a testbed
- two extensions to reduce sync overhead:
 - a) 'ctags' (identify changes to collections)
 - b) XMPP PubSub push (server notifies the client)
- all that is in the Darwin Subversion repository

Known Issues

- UID vs URL
- iCalendar issues (say aloud: alarms, RRULEs!)
- vCard issues (detecting deleted attributes)
- Location Header in Creation-PUT and Consistency
- Again, don't be afraid, little real world issues

Implementation Overview

- Groupware Servers in 2007
- Groupware Servers Today
- FOSS Servers I recommend ;-)
- Apache mod_dav as a full GroupDAV backend
- Clients: Mozilla, Evolution, Kontact, Others

Groupware Servers 2007

CalDAV (draft)

ORACLE®



GroupDAV



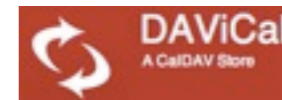
Proprietary

(a.k.a. self invented)



CalDAV/GroupDAV in Servers TODAY

- ScalableOGo, Apple iCal Server, Apache mod_dav, Bedework, Google Calendar / Apps, Yahoo!, Oracle Beehive, OpenGroupware.org, eGroupware, Citadel, Cosmo, MailEnable, DAViCal, IceWarp, Zimbra, FIN, CommunigatePro, Dingo, Group-Office, Horde, Kerio, Scalix, Mailware, Bongo (Hula), ...



FOSS Servers I Recommend

- ... hundreds of projects in the 'Groupware' category on Freshmeat ..., I recommend:
- DAViCal for PHP Developers
- Darwin Calendar Server for Python Developers
- ScalableOGGo for Objective-C Developers
- Bedework for Java Developers
- don't know any Perl or Ruby ones ... tell me ;-)



Apache mod_dav

- if you have proper GroupDAVv2 fallbacks it just works
- current implementations: Evolution AB and Outlook

```
127.0.0.1 - helge [05/Feb/2009:16:59:13 +0100] "REPORT /davcal/TestCal/ HTTP/1.1" 405 239 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:13 +0100] "GET /davcal/TestCal/zl-event-20090103-221412-109-0.ics HTTP/1.1" 200 248 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:13 +0100] "GET /davcal/TestCal/zl-event-20090105-151720-515-0.ics HTTP/1.1" 200 204 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:13 +0100] "GET /davcal/TestCal/zl-event-20090109-003654-468-0.ics HTTP/1.1" 200 215 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:13 +0100] "GET /davcal/TestCal/zl-event-20090109-003714-000-0.ics HTTP/1.1" 200 201 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:13 +0100] "GET /davcal/TestCal/zl-event-20090109-003746-328-0.ics HTTP/1.1" 200 225 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:13 +0100] "GET /davcal/TestCal/zl-event-20090109-003817-265-0.ics HTTP/1.1" 200 250 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:13 +0100] "GET /davcal/TestCal/zl-event-20090109-175045-484-0.ics HTTP/1.1" 200 247 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:13 +0100] "GET /davcal/TestCal/zl-event-20090109-175057-203-0.ics HTTP/1.1" 200 195 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:13 +0100] "REPORT /davcal/TestCal/ HTTP/1.1" 405 239 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:13 +0100] "GET /davcal/TestCal/zl-event-20090130-155819-609-0.ics HTTP/1.1" 200 195 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:13 +0100] "GET /davcal/TestCal/zl-event-20090130-155851-187-0.ics HTTP/1.1" 200 222 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:14 +0100] "GET /davcal/TestCal/zl-todo-20081228-133942-031-0.ics HTTP/1.1" 200 196 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:14 +0100] "GET /davcal/TestCal/zl-todo-20081228-133950-609-0.ics HTTP/1.1" 200 193 "-"
127.0.0.1 - helge [05/Feb/2009:16:59:14 +0100] "GET /davcal/TestCal/zl-todo-20081228-133959-015-0.ics HTTP/1.1" 200 222 "-"
```





KDE Kontact



- GroupDAV in Kontact 3.x in 2004
- Supports: Tasks, Events and Contacts
- Misses: Folder Discovery
- Misses: Proper Conflict Handling
- Kontact 4.x / Akonadi - NO SUPPORT
- Help us ;-)



OpenGroupware.org





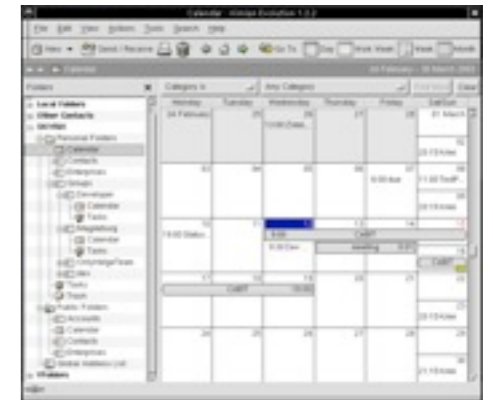
Novell Evolution



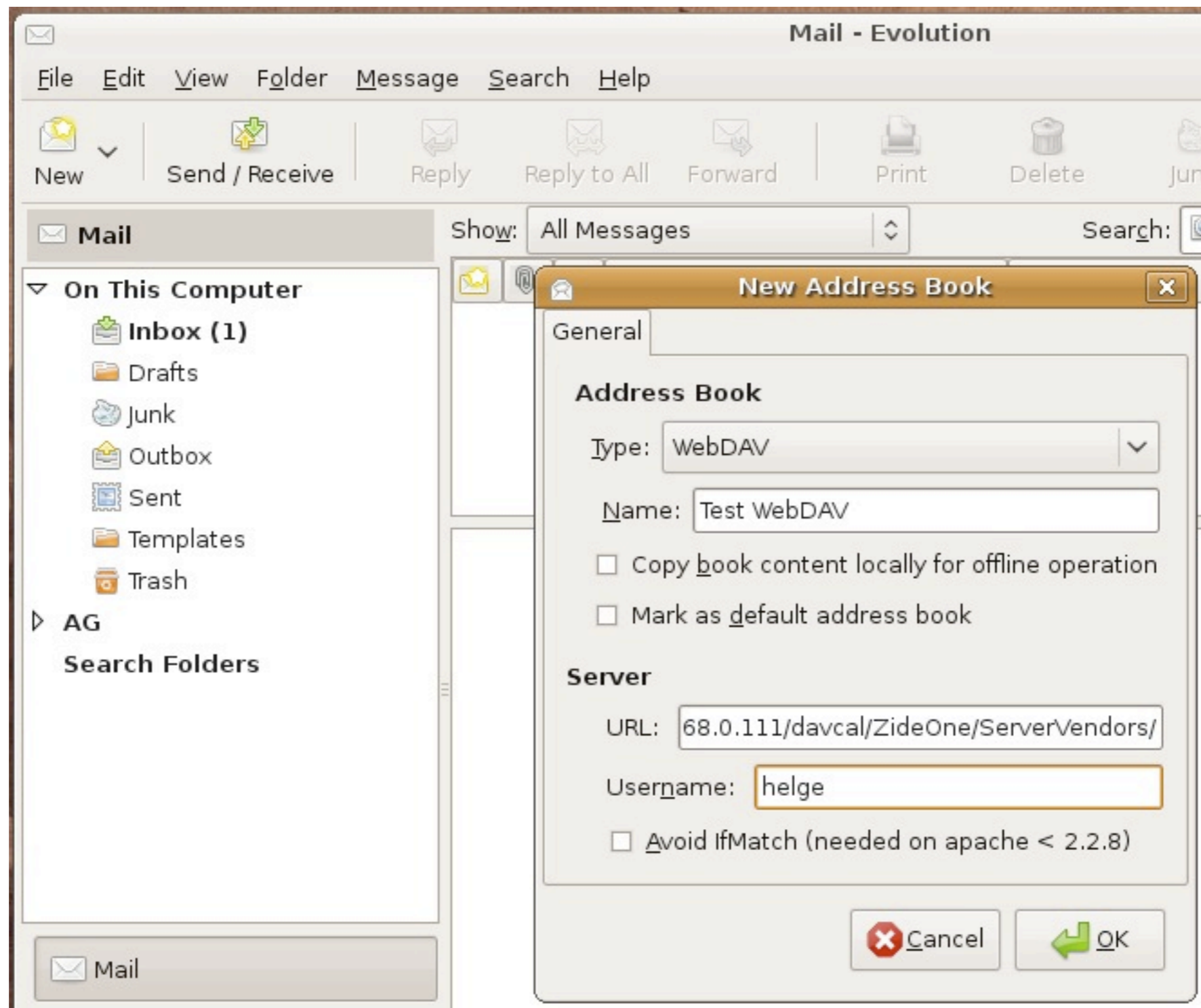
- GroupDAV Noodle Project
 - bitrotten, never really finished
- Today:
 - CalDAV support, no GroupDAV fallbacks
 - WebDAV addressbook (works with Apache!)
- Missing (help us ;-):
 - Collection browsing, GroupDAV Cal



noodle



WebDAV Addressbook



Evolution CalDAV

The screenshot shows the Evolution calendar application interface. A 'New Calendar' dialog box is open, allowing the user to create a new CalDAV calendar. The dialog contains the following fields and options:

- Type:** CalDAV
- Name:** Darwin Calendar Server
- URL:** caldav://localhost/principals/users/
- Use SSL
- Username:** helge
- Color:** A color selection bar with a light green color chosen.
- Copy calendar contents locally for offline operation
- Mark as default calendar

Buttons for 'Cancel' and 'OK' are located at the bottom right of the dialog. The background shows the main calendar view with a sidebar on the left containing 'CalDAV', 'On This Computer', and 'Contacts' sections. A calendar grid for February 2009 is visible, with the 6th of the month highlighted.



Mozilla Sunbird / Lightning

- A lot of CalDAV work going on for Lightning
- GroupDAVv1 Addressbook for Thunderbird
available from the ScalableOGo projects
- Missing:
 - GroupDAV calendars
 - collection browsing

Other Clients

- Funambol GroupDAV Plugin - Sync Mobile Devices
- Mulberry
- Chandler
- Apple iCal.app
- eM Client
- ... Outlook (commercial and FOSS OpenConnector)

Writing a xyzDAV Connector

- all OpenSource clients implement iCalendar, vCard so no work here (thats the hard part)
- the core is a simple Cache, an item composed of
 - the vCard/iCal payload (BLOB)
 - the URL
 - the ETag (HTTP Entity Tag)
- Again: please implement GroupDAV first

Libraries

- there are CalDAV / WebDAV libraries, eg:
 - CalDAV4J, CalDAVClientLibrary(Py), OGo SOPE, vObject, Mulberry
- my recommendation: don't use them ;-)
 - use your favorite HTTP library (eg libcurl)
- the only thing you need to do is an XML parser for PROPFIND results (possibly one for principals)

Debugging Tools

- curl - cmdline HTTP client
 - feed it with the GroupDAVv2 request
- cadaver - cmdline WebDAV client

Call for Help

- Lets improve standards support for FOSS clients!
- We need:
 - Mozilla: pretty good, GroupDAV+browsing
 - Evolution: reasonable, browsing, GD would be nice
 - Kontact4: oh well, best to do a Plugin from scratch?
- OpenConnector (Outlook), if you are into
Windows Development plus MAPI plus DLL hell ;-)

Contact

- primadonna@helgehess.eu
- groupdav@opengroupware.org
- ietf-caldav@osafoundation.org
- vcarddav@ietf.org
- <http://www.caldav.org/>

Q & A

Q & A

then

Discuss!