



REXX on the Mac

ooRexx and NetRexx on MacOSX

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Agenda

History

Apple II and Macintosh

MacOSX

NetRexx

Regina

ooRexx



Apple History: From Apple II to Macintosh



Case design.

Keyboard.

Mouse.

User interface.

People.



Text describing case design.

Text describing keyboard design.

Text describing mouse design.

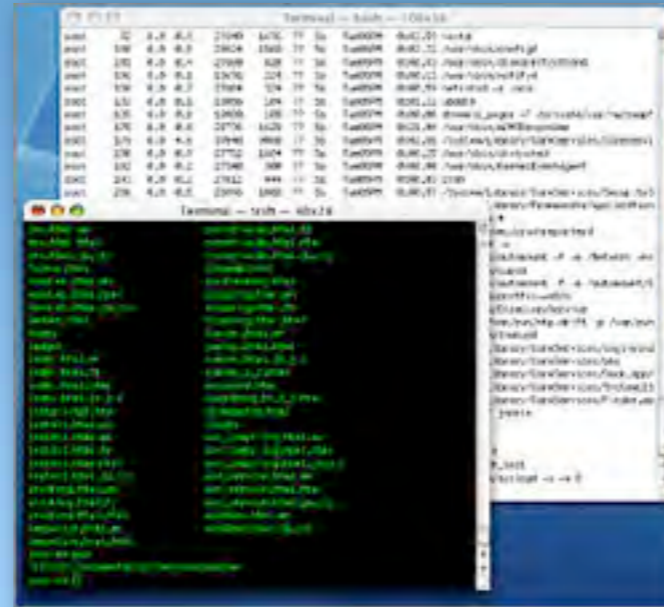


Text describing user interface design.



Text describing the people involved in the design.

MacOSX is Unix



Java
for Mac OS X



Based on UNIX
Solid as a rock.





In 2004 REXX was still mentioned on this developer page

UNIX Utilities and Scripting Languages

All of the standard UNIX utilities and scripting languages are included in Mac OS X: editors such as emacs, vim and even ed; file management tools such as cp, mv, ls and tar; shell scripts including bash (the default shell), tcsh (csh) and zsh. Tiger adds the korn shell so you can run scripts written for other operating systems more easily. And of course you can use scripting languages such as Perl, PHP, tcl, Ruby and Python, with native support for the popular Tcl/TK, TKInter and WxWidgets toolkits. Python users can also script the powerful [Quartz](#) compositing engine. Visit the [Open Source](#) page for more Open Source utilities in Mac OS X.



Universal Libraries

Mac OS X provides a robust set of optimized libraries,

Technology Brief

[Learn more about the UNIX based underpinnings](#)

In the Spotlight

Access [Spotlight](#) via the Terminal using mdls or mdfind to search application metadata.

UNIX foundation

With its Open Source, UNIX-based foundation, Mac OS X Panther lets you script with your choice of languages: Perl, PHP, Python, REXX, Scheme, Tcl and more. You can work with built-in development tools such as gcc, gdb, vi, emacs and pico and take advantage of UNIX shell tools such as grep, chmod, ps, crontab, top and tail. If you've written utility software on another UNIX platform, you can quickly get it running in Mac OS X Panther.

In addition to leveraging the gamut of UNIX tools, you can easily extend the power of your software by using QuickTime's complete multimedia architecture, including support for Flash 4, Cubic VR, RTP/RTSP video streaming, MPEG and a wide array of graphic file formats. New in Panther, you can script the Mac OS X graphics architecture, Quartz, with python."

Apple Norway still likes REXX?



La Mac-økosystemet blomstre.



UNIX-fundament

Mac OS X Tiger er basert på åpen kildekode og [UNIX](#). Dette gjør at du kan skrive prosedyrer i det språket du foretrekker: Perl, PHP, Python, REXX, Scheme, Tcl og andre. Du kan arbeide i de innebygde utviklingsverktøyene, for eksempel gcc, gdb, vi, emacs og pico, og dra nytte av UNIX shell-verktøy som grep, chmod, ps, crontab, top og tail. Hvis du har utviklet programvare på en annen UNIX-plattform, tar det ikke lang tid å få den til å fungere i Mac OS X Tiger.



I tillegg til at du har tilgang til det brede utvalget av UNIX-verktøy, kan du på en enkel måte videreutvikle programvarens bruksområde ved hjelp av QuickTimes komplette multimediearkitektur, inkludert støtte for Flash 4, Cubic VR, RTP/RTSP-videostreaming, MPEG og en lang rekke grafikkfilformater.

64-bits kompatibilitet

Tiger har en nydesignet kernel og et oppdatert systemprogramvarebibliotek som er spesielt beregnet på 64-bits PowerPC [G5-prosessorer](#). Den oppdaterte kernelen gir de største fordelene til 64-bits databehandling ved å bryte 4 GB-grensen for fysisk hukommelse. Nøkkelfunksjonene til systemets matematikk- og vektorbiblioteker er fininnstilt slik at de drar fordel av nye og raskere beregningsfunksjoner som støttes av 64-bits G5-prosessorer. I tillegg vil umodifiserte programmer som bruker systemets beregningsfunksjoner få en automatisk ytelsesforbedring på



With the introduction of Mac OSX REXX was mentioned on a lot of these pages; gradually, for no apparent reason, REXX started to disappear. This still has it, probably an oversight.

This is from the Norwegian language translation of the developer tools page,

[Apple - Mac OS X - Utviklerverktøy](#)

We must find out why and see to it that it comes back.

Is Rexx on the Mac a marketable option?



A niche in a niche?

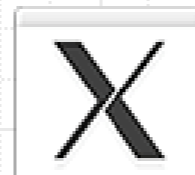
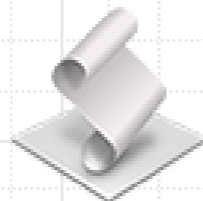
An April 2006 sample of Dice Board (www.dice.com) job postings was analysed.

So Rexx on Mac is a niche language on a niche platform, for business purposes.

But do not forget that these numbers do not tell all. For example, some developers on our “officially” Java on Windows project are in fact using NetRexx on Mac for most real, creative work. (The kind you need to do *at home*, with today’s ‘open plan’ offices).

Developer Tools

Grow the Mac ecosystem.



Is Rexx on the Mac a marketable option?



A niche in a niche?
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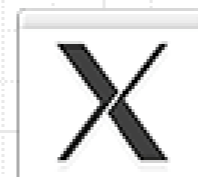
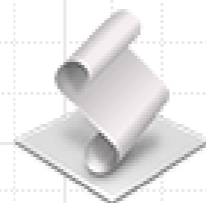
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Is Mercedes-Benz a niche brand?

Apple's consumer market share is larger than the number of developers indicates. The graphical- and design industry for example traditionally has a very large percentage of Mac users, in the high 60's.

Music production is another field in which Macs are ubiquitous.



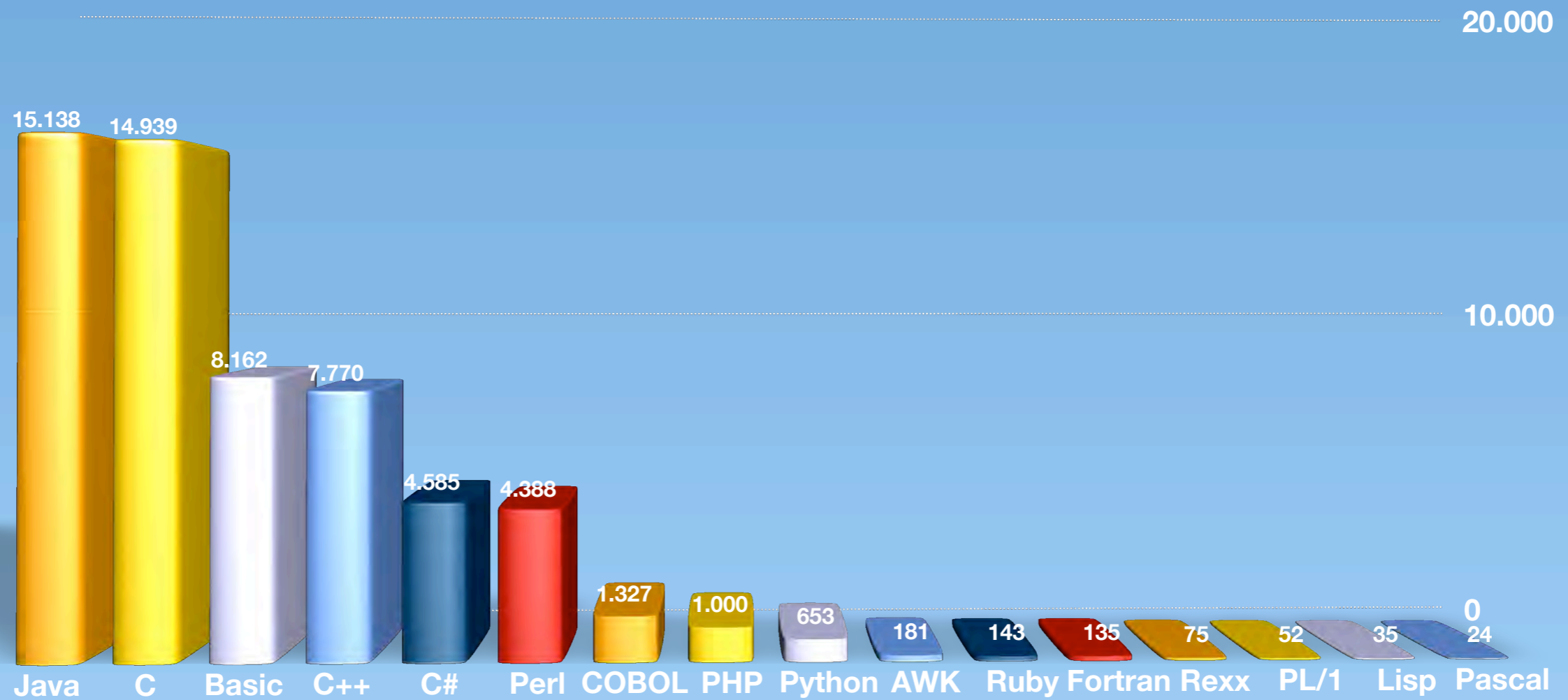
Is Mercedes-Benz a niche brand?

(It's only got 2,5% market penetration, half that of Apple Macintosh's 5%.)



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But wait:

- ✓ if MacOSX is Unix then the actual number must be $13153 + 6822 + 781$?
- ✓ if NetRexx is Java then the actual number must be $20756 + 15138 + 75$?
- ✓ now if BSF4Rexx would run on MacOSX the number will be ... enormous?



Current Porting Status

- An ooRexx 3.01 pre-beta for MacOSX on PPC is available since June 1st, 2005. (269 pageviews)
- It passes most Classic Rexx and Object Rexx tests

```
Terminal — tcsh (tty)
[liberty:~/data/rexx] rvjansen% cps
Open Object Rexx Interpreter Version 3.0.0 for MacOSX
Build date: Jun  1 2005
Copyright (c) IBM Corporation 1995, 2004.
Copyright (c) RexxLA 2005.
All Rights Reserved.
This program and the accompanying materials
are made available under the terms of the Common Public
which accompanies this distribution.
http://www.ibm.com/developerworks/oss/CPLv1.0.htm

----- REXXCPS 2.1 -- Measuring REXX clauses/second -----
REXX version is: REXX-ooRexx_3.0(MT) 6.00 1 Jun 2005
  System is: MacOSX
  Averaging: 5 measures of 3 iterations

Performance: 430812 REXX clauses per second

[liberty:~/data/rexx] rvjansen%
```



Problem Areas

BSD's not Linux

pThread is not a pointer but a structure in BSD (and thusly in Mac OSX)

Some flags on fopen are different

Will be fixed when ooRexx 4.0 will be available

```
unix/RexxMain.cpp:406: error:   initializing argument 1 of 'long unsigned int
(int, RexxString*)'
unix/RexxMain.cpp: In function 'long unsigned int RexxSetTrace(pid_t, _opaque
unix/RexxMain.cpp:430: error: invalid conversion from '_opaque_pthread_t*' to
unix/RexxMain.cpp:430: error:   initializing argument 1 of 'long unsigned int
(long int, long unsigned int)'
unix/RexxMain.cpp: In function 'long unsigned int RexxResetTrace(pid_t, _opaq
unix/RexxMain.cpp:455: error: invalid conversion from '_opaque_pthread_t*' to
unix/RexxMain.cpp:455: error:   initializing argument 1 of 'long unsigned int
(long int, long unsigned int)'
```



Working on testsuite

Uses OrxByEx examples
courtesy of J. Urbaniak

```
Terminal — tcsh (ttyp2)
|liberty:~/Desktop/ooRexxUnit| rvjansen% rexx runAllTests.rexx
searchFile=|./*.testUnit|, SysFileTree()-switches: [FO] ...
ooRexxBASE.runTests (run all of the base testUnit tests)

nr of test runs:          3
nr of successful assertions: 16
nr of failures:          0
nr of errors:            0
|liberty:~/Desktop/ooRexxUnit| rvjansen% █
```

```
::requires ooRexxUnit.cls      -- load the
                                -- class named exactly like file
::class "orxbyExAdvanc2.testUnit" subclass

::method testStem
dog          = .Stem-NEW('The Dog Stem')
dog.2       = 'Red'
dog.1       = 'Chipper'
dog.1.breed = 'Mutt'
dog.2.breed = 'Collie'
dog.3       = 'Spike'
dog.3.breed = 'Lab-mix'

hound       = .directory-NEW

hound-Irish = 'Irish Wolf Hound'
hound-Russian = 'Russian Wolf Hound'

/* assign the directory 'hound' to the stem
dog.hound   = hound

self-assertEquals("stemTest1", dog.hound)
self-assertEquals("stemTest2", dog.hound)

myarray     = dog.-MAKEARRAY

self-assertEquals("stemTest3", myarray[1])
self-assertEquals("stemTest4", myarray[2])
self-assertEquals("stemTest5", myarray[3])
self-assertEquals("stemTest6", myarray[4])
self-assertEquals("stemTest7", myarray[5])
self-assertEquals("stemTest8", myarray[6])
self-assertEquals("stemTest9", myarray[7])
self-assertEquals("stemTest10", myarray[8])
```


A low-angle photograph of a Ferris wheel at dusk, with its intricate metal structure and several passenger cars visible against a dark blue sky. The text is overlaid on this image.

Working on BSF4Rexx4Mac

Might be ready earlier than you think

But not only for GUI:

Totally integrates Java
and Object Rexx

Can combine statically
typechecked classes with
Object Rexx's dynamically
added properties and
methods

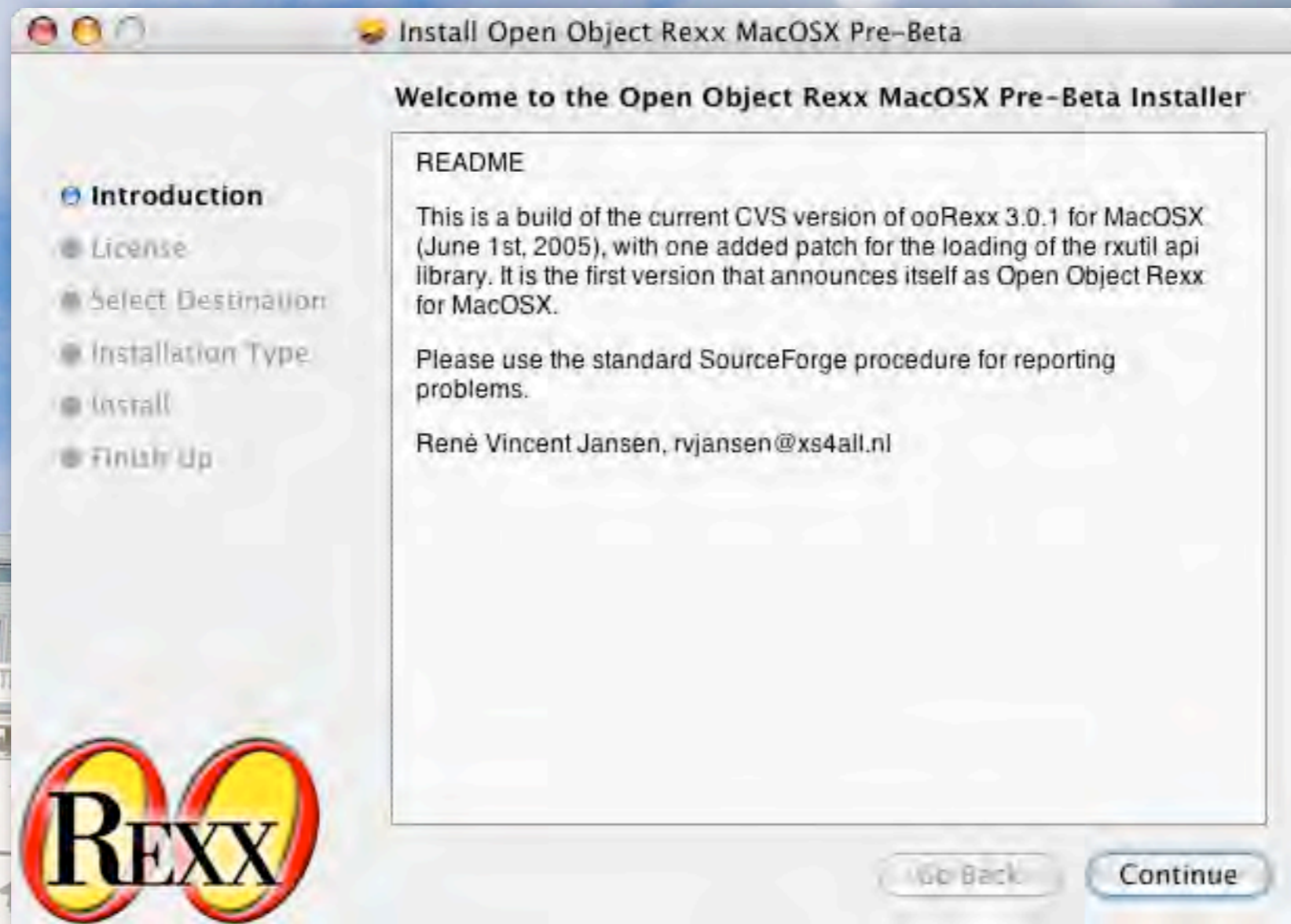
Use Java collection
classes for speed, thread
safety or just familiarity

Marries Object Rexx and
NetRexx

Possibilities just boggle
the mind- run
INTERPRET on stuff
returned from Java and
send it back ...

Installer package











Installer package



We need universal binaries to support new Apple hardware



**What's an Intel chip
doing in a Mac?
A whole lot more than
it's ever done in a PC.**



**ooRexx needs to be ported to the new
Intel Macs also - and quickly**



**An expanding universe
of applications.**

Transitions through
Instruction Set
Architectures

Currently moving to
Intel - new porting
issues

GCC compiler
supports multiple
target architectures





Regina on MacOSX

Great for Classic Rexx

Regina **Rexx**

AppleScript launcher
by William Kleinwachter
from Maui (one of the
original JES2
developers)

MacOSX installer by
yours truly (981
downloads on
Sourceforge)

ANSI Rexx conformant
and very stable



NetRexx on MacOSX

“Write once, run anywhere”

Java Support in MacOSX is excellent

There are no known differences in running NetRexx as compared to other platforms

When combined with an Interface painter a hard to beat development combo





Editor Support

You only need one of course

(see newsgroup alt.religion.emacs)

Emacs Classic REXX and NetREXX modes are working unchanged due to being written in eLisp

There is no special ooREXX support, but this is being worked on

We need Eclipse support to be *en vogue* with the current generation of developers - it seems they cannot do without syntax/ library method completion



Editor Support

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(see newsgroup alt.religion.emacs)

```

method add() returns String
  transaction = this.session_.beginTransaction()
  uri_ = UniformResourceLocator()
  if this.getSystemAddress() = null then this.setSystemAddress('local')
  uri_.setPrimaryName("http://" + this.getSystemAddress() + ":8080/invoker/c
  ")
  this.session_.save(uri_)
  sip = SystemImplementationService()
  if this.getPrimaryName() = null then this.setPrimaryName('dummy name')
  sip.setPrimaryName(this.getPrimaryName())
  sip.setUniformResourceLocator(uri_)
  this.session_.save(sip)
  transaction.commit()
  say CRDutil.getUser() 'added a SystemImplementationService at' this

```

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What does Emacs NetRexx mode support offer?



```
concat
"options \\(\\( ?\\|\\<\\(no\\)?"
"\\(binary\\|"
"c\\(o\\(m\\(ments\\|pact\\)\\|nsole\\)\\|rossref\\)\\|"
"d\\(ecimal\\|iag\\)\\|"
"explicit\\|"
"java\\|"
"format\\|"
"logo\\|"
"replace\\|"
"s\\(avelog\\|ourcedir\\|trict\\(args\\|assign\\|case\\|impor
"
"trace\\(\\|1\\|2\\)\\|"
"utf8\\|"
"verbose\\(\\|0\\|1\\|2\\|3\\|4\\|5\\)"
"\\|\\>\\|+\\|\\)"
```



What does Emacs NetRexx mode support offer?



Syntax Coloring

Index of methods in source code

Speedbar

JavaDoc support

Boilerplate Class generation

Do End, brace and parens matching

Auto Indentation

Auto-package statement

```
concat
"options \\(\\( ?\\|\\<\\(no\\)?)\"
"\\(binary\\|\"
" c\\(o\\(m\\(ments\\|pact\\)\\|nsole\\)\\|rossref\\)\\|\"
" d\\(ecimal\\|iag\\)\\|\"
" explicit\\|\"
" java\\|\"
" format\\|\"
" logo\\|\"
" replace\\|\"
" s\\(avelog\\|ourcedir\\|trict\\(args\\|assign\\|case\\|impor
\"
" trace\\(\\|1\\|2\\)\\|\"
" utf8\\|\"
" verbose\\(\\|0\\|1\\|2\\|3\\|4\\|5\\)\"
" \\|\\>\\|\\+\\|\\|\"
```



- ✓ REXX Mode by Anders Lindgren, Johan Bergkvist and James Perrin
- ✓ NetREXX Mode by Arjan Bos - total rewrite from scratch, 2003



Compiler Server

Resident NetRexx Compiler

The *nrxsrv* NetRexx compiler server speeds up builds by keeping a VM around that does not need to reload Java and the NetRexx compiler.

It is a client/server program. The client (started from **make**) feeds the server the names of the files to compile. The resulting class files are written to disk.

Open source and downloadable. Cuts build time in half.

```
Terminal — tcsh (tty1)
[liberty:~/data/rexx] rvjansen# nrxsrv
[liberty:~/data/rexx] rvjansen# NrxSrv 1.2
NrxSrv by I-Bizz Version 1.2.1, 2004. Started and running on port 2001.
When option -sourcedir is not used, .class files will be written to:
/Users/rvjansen/data/rexx

[liberty:~/data/rexx] rvjansen#
```

Build native code



```
makefile.mac: /Volumes/Workspace/src/com/abnamro/midms/platform/makefile.mac
all: libMacOSX_ppc_PlatformSecurity.jnilib

libMacOSX_ppc_PlatformSecurity.jnilib: MacPlatformSecurity.c
    cc -c -I/System/Library/Frameworks/JavaVM.framework/headers MacPlatformSecurity.c
    cc -dynamiclib -o libMacOSX_ppc_PlatformSecurity.jnilib MacPlatformSecurity.o -framework JavaVM
    touch dummy.jnilib
    cp *.jnilib ../../../../../../
    rm ../../../../../../dummy.jnilib

.PHONY: clean
clean:
    rm -f *.jnilib

-(DOS)-- makefile.mac  All (5,97)  SVN-6876  (Text)
```

Turn it into shared library



Platform dependent stuff

Mac dependent methods can be implemented using C and need to go into a native shared library, just like an external REXX function would.

```
MacPlatformSecurity.c: /Volumes/Workspace/src/com/abnamro
The native function to get the logged on user, to accom
Java's lax approach to this.

#include <jni.h>
#include <unistd.h>
#include <sys/types.h>
#include <pwd.h>

char *get_user_name();

char *get_user_name(){
    struct passwd *pass = NULL;
    char *name = NULL;
    uid_t id = getuid();
    pass = getpwuid(id);
    if (pass) {
        name = pass->pw_name;
    }
    return name;
}

JNIEXPORT jstring JNICALL Java_com_abnamro_midms_platform
_Id(JNIEnv *env, jobject obj) {
    return (*env)->NewStringUTF(env, get_user_name());
}
```

Future plans



Port ooRexx 4.0 and integrate
AppleScript support -
automate applications

ooRexx support module for
NetBeans and Eclipse

Second source NetRexx compiler
- EU funding is underway

ooRexx - NetRexx *rapprochement*?
Port BSF4Rexx - quickly

But there is always other work, so don't hold your breath ...



Port ooRexx 4.0 and integrate
AppleScript support -
automate applications

```
Record Stop Run Compile Bundle Center  
repeat  
  set theResult to display dialog "To whom would you like to send  
  this message?" default answer "Example: Jane Doe"  
  set theName to text returned of theResult  
  if (theName does not start with "Example:") then  
    exit repeat  
  end if  
end repeat  
  
-- Repeat this loop until the text entered has been changed from the  
-- default example text.  
-- Email address validation could be done at this point.  
repeat  
  set theResult to display dialog "What is their email address?"  
  default answer "Example: janedoe@example.com"  
  
  exit repeat  
end if  
end repeat  
  
-- Prompt for message subject  
set theResult to display dialog "What would you like the subject of  
the message to be?" default answer "I'm sending this via  
AppleScript!"  
set theSubject to text returned of theResult
```

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I-Bizz IT Services and Consultancy, Amsteldijk 14, 1074 HR Amsterdam
The Netherlands

Thanks for your attention!

Want to be involved in ooRexx-BSF4Rexx-NetRexx Mac work?

contact rvjansen@xs4all.nl

