No, I was not on Crack

Je ne regrette rien

Brought to you by

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Wed May 11 23:11:48 CEST 2005

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Why? Why? Why?

Why? Why? Why?

- Just because

pkgsrc

- Started in 1997
- Based on FreeBSD's pkg_install tools
- Infrastructure imported
- Packages imported piecemeal

Why is it called pkgsrc?

- At the time, we had a number of cvs modules
- basesrc, gnusrc, xsrc, localsrc
- A "port" in NetBSD terminology is a
  - "platform" or
  - "architecture"
- So we used the term "package"
- Hence we have "package source" or "pkgsrc"

"ports" vs. "packages"

- No problems: we have
  - Packages
  - Binary packages

Location, location, location

- We wanted to make it possible for a number of pkgsrc trees to be in use at any one time
- Compartmentalisation
- We moved /usr/share/mk/bsd.port.mk to mk/bsd.pkg.mk

Documentation

- I wrote some text on
  - creating pkgsrc entries
  - how to use pkgsrc to install and manage third-party software
- These were collated by Hubert into Packages.txt
- which has now grown and become The Pkgsrc Guide

Documentation(2)

- FreeBSD documented all its variables at the head of bsd.port.mk
- So we broke out that documentation into packages(7)

Library Versioning

- At the time, FreeBSD had whole lots of

  LIBDEPENDS= libjpeg\.so\.6.*

- in their Makefiles
- We removed all of this, and based our library dependencies on package version numbers

- We had to, the a.out versioning scheme would not transfer to ELF

Package Versioning

- Once we'd done this, it was obvious we had problems with upgrades.
- So I added the "Dewey" package versioning to pkg_install
- OK, I was also told that it couldn't be done, so that was why I did it
- (We still have the problem with upgrades, but package views is designed to fix that)

RUNDEPENDS

- Well, RUNDEPENDS had to die, too

Manual pages

- FreeBSD added package manual pages to their package Makefiles
- This presumably is a corollary to the basesrc MAN=wibble.1 convention
- This, for me, violates the POLS. All files and directories should be in the PLIST
- That's what we do - we just manipulate the PLIST with awk to get the right location and suffix

Checking type of PLIST entries

- We assumed everything was a file unless it said otherwise
- pkg_create checks the types of all the entries it has
- if it gets a directory without an @dirrm, it gets changed to be an @dirrm

Symbolic links

- pkg_create also grew a check to make sure that symbolic links were relative to the ${PREFIX}

- In theory, this will allow packages to be able to be installed in a location other than the ${PREFIX} it was built with

- May even work, if there are no shared libraries within the package

Porting to other Operating Systems

- I was managing a number of Solaris machines (40+) at Commerzbank in London
- I needed a coherent packaging system for them
- pkgsrc was ported to Solaris 2.6 in February 1999
- surprisingly painless
- That's when we grew the PKG_DEBUG_LEVEL definitions for debugging
- If ever you want to find out what's going on, use "PKG_DEBUG_LEVEL=2"

Zoularis

- In those days, we made everything look like NetBSD
- We used a wrapper layer around NetBSD utilities and libs
- It was written by Christos Zoulas
- So I called it Zoularis, as a very bad pun
- What was the title of this talk?

pkgsrc grows

- abs and Christos ported pkgsrc to Linux
- Zoularis is still difficult to port
- Based on NetBSD-current, all the headers are difficult to keep in sync with native Solaris
- I've moved on by this time, no longer have any Solaris boxes except my SS1+ ones
- Bill Coldwell is pushing me to port pkgsrc to Darwin

Generic bootstrap kit

- Zoularis's heavyweight nature, and ongoing love and affection needs
- All the modern utilities are on the various different operating systems
- Let's move to a generic bootstrap kit via GNU autoconf

Adding @comment lines to PLISTs

- Seemed obvious to me
- I like being able to find out just what files a package was built with
- FreeBSD discounted the idea

Build Information and Version

- Again, it seemed obvious to me
- pkg_info -B shows all the definitions a package was built with
- pkg_info -b shows all the versions of infrastructure files a package was built with

SHA1 digests on patchfiles

- We were getting a steady influx of PRs about build problems
- These were unreproducible for a number of people
- The problem had already been fixed
- The problem was that the user had out of date patch files
- Untarring the tarfiles over existing installation?
- Now we no longer get these problem reports

MD5 considered harmful

- Originally, all of our distfiles were "checked" with MD5 distfiles
- MD5 has generally been considered breakable for a while
- So Nick Hudson and I moved all MD5 digests to SHA1

SHA1 considered harmful

- More recently, SHA1 has been shown to be weaker than at first thought
- So we have moved to multiple digests
- Now we use SHA1 and RMD160
- Unfortunately, these digests are from the same family, but we have raised the bar considerably for anyone trying to introduce trojans
- I'd like to move to Whirlpool digests in the future (in addition to SHA1 and RMD160)

Just-in-time su(1)

- Again, this one seemed obvious to me
- It is horrible to have to do everything as root
- Especially on a network with NIS+, netgroups, ssh and root occasionally having less privileges than ordinary users
- So we gained just-in-time su(1)
- Just after that, we started to see some configure scripts containing trojans.
- Boy, was I glad we'd done that

EVAL_PREFIX

```
.if defined(EVAL_PREFIX)
.  for def in ${EVAL_PREFIX}
.    if !defined(${def:C/=.*$//})
${def:C/=.*$//}_DEFAULT?=${LOCALBASE}
_${def:C/=.*$//}_CMD=  ${PKG_INFO} -qp ${def:C/^.*=//} 2>/dev/null | ${AWK} '{ print $$2; exit }' | ${GREP} . || ${ECHO} ${${def:C/=.*$//}_DEFAULT}
```

```
${def:C/=.*$//}=        ${_${def:C/=.*$//}_CMD:sh}
MAKEFLAGS+=             ${def:C/=.*//}=${_${def:C/=.*$//}_CMD:sh}
.    endif
.  endfor
.endif
```

OK, I was on crack for that

(The ${GREP} needs to go from the above - awk can do it AND print the default)

Signed Packages

- We needed a way to do signing like RPM
- I added gpg and pgp signing, with a detached signature, on September 20th, 2001
- For some reason, people were otherwise occupied around that time
- There is/was no viable alternative to gpg

gensolpkg

- The problem was that NetBSD .tgz packages weren't accepted by a number of Solaris administrators
- They should have known better because I was the source of their bonuses
- But we do need to listen when constructive criticism is made
- There was also the slight problem of bootstrapping and integration with Jumpstart at the time
- gensolpkg generates a Solaris package from an installed binary package

genrpm

- And so to Linux
- We have the same problem here as on Solaris, although less severe
- But just as religious
- To be agnostic, we now provide the same facility on Lunix

@exec and @unexec verbosity

@exec and @unexec verbosity

- While you were watching that

```
@unexec echo "Finding manual page inconsistencies (this may take a while)"
@unexec rm -rf /
```

was just executing on your computer

@exec and @unexec verbosity (2)

- Why did I do this?
- Because I am naturally a garrulous and friendly individual who likes to take time to tell people what is happenning in all aspects of my life, from day to day management of domestic triumphs and other challenges, to the issues and relevant information items in the workplace. I find that in order to do this, using many words, where a few would suffice, is the best and most optimal solution. In fact, a future trend would be towards ever more loquatiousness on my own part...

@exec and @unexec verbosity (3)

- pkg_delete and pkg_add are executed as root
- We have no digital signature or other protection for the +CONTENTS file (rpm's and other packaging systems do)
- Because there are distinct scenarios when a malevolent admin can leave timebombs which are untraceable via modifying installed +CONTENTS header
- Being verbose about it won't fix it, but it will make it obvious what happened
- Because the people who are into security recommended it
- Because it has been used to debug and find problems in packages

Some things we didn't pick up

- OpenBSD's flavours
  - I consider them to be much too heavyweight for the gain that we get
  - They can play havoc with binary package naming schemes
  - I feel it's easier to have specific packages

More things...

- A different directory structure
  - It's been proposed
  - I'm certainly not against it
  - I just personally don't want to do the work

More, more things...

- A move to subversion instead of cvs
  - I'm really not convinced that subversion is there yet
  - I'm concerned at db4 backend problems
  - monotone or opencm may be a more viable alternative
  - But rest assured I'm not going to rely on email and patchsets
  - (for those of you who don't get the last reference, please see the Linux kernel mailing list)

He wouldn't let me have a new category!

- I think that our approach in the past has been good
- But we should keep reviewing things
- Create a new category when there's critical mass
  - Quantify critical mass!
  - Anything over 10-15 packages

Our categories suck!

- Yes, I agree
- misc, devel and net all have too many
- Thomas was the architect of the last round of changes
- If anyone wants to change them, please suggest it to tech-pkg@NetBSD.org

Conclusion

- Occasionally, some of the things I do seem bizarre
- Those of you who know me will realise that this is intended
- Please be assured that there was a good reason for doing these things
- Above everything, I'm a user of pkgsrc. If it isn't performing in ANY way, I'd like to change it to make it better

The End

Any Questions?

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