



# Mondo Rescue: A GPL disaster recovery solution

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# MondoRescue

## Introducing myself



- Software engineering and Unices since 1988
  - Mostly Configuration Management Systems (CMS), Build systems, quality tools, on multiple commercial Unix systems
  - Discover Open Source & Linux (OSL) & first contributions in 1993
  - Full time on OSL since 1995, first as HP reseller then @HP
- Currently:
  - Technology **Architect** on OSL for the HP/Intel Solution Center, Grenoble
  - OSL HP **Ambassador**
  - EMEA OSL HP **Profession Lead**
  - Solutions Linux Conference board member
  - MondoRescue, Dploy.org, Project-Builder.org **project lead**
  - LinuxCOE, mrepo, tellico, rinse, fossology **contributor**
  - Mandriva, Fedora **packager**





- Disaster Recovery Plan (DRP):
  - Identifying, inventorying and classifying the critical systems and data in the enterprise (in relationship with their value for the enterprise) and consequent procedures, processes and systems to put in place to recover from a disaster.
  - Balance between DRP implementation costs and downtime costs, or loss of data/services costs.
  - Much more paper based than computer based. However tools are also needed as part of the plan. Also DR doesn't substitute itself to backups or archives.
  - Today, among the systems to deal with, you'll have Linux systems.
- Points to consider:
  - Recovery of solutions: systems, network, storage, connectivity, HA configurations and coherency between those elements.
  - Recovery of system configuration (BIOS, Stripe size, Block size, FS layout and options, Boot loader, OS data, users and application data, ...) and coherency between those elements.

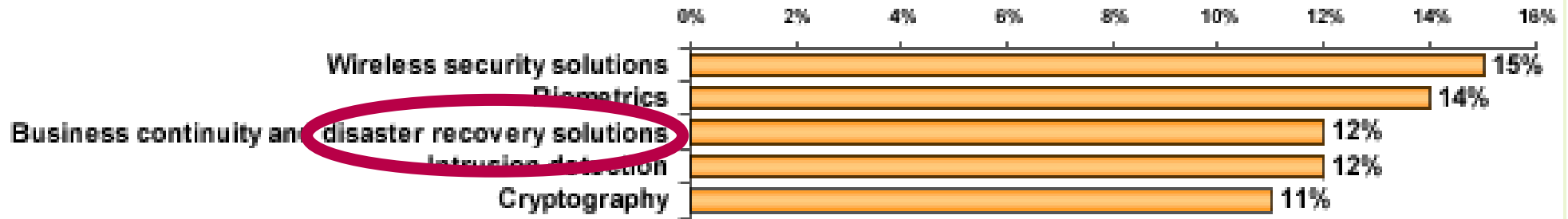


# MondoRescue

## Disaster Recovery



Figure 4 - Information Security Technologies - Planned for Deployment



Frost & Sullivan 2008 (ISC)2 Global information security Workforce Study  
[https://www.isc2.org/download/2008\\_Global\\_WF\\_Study.pdf](https://www.isc2.org/download/2008_Global_WF_Study.pdf)

Table 2 - Top Five Security Technologies Being Deployed by Region

Rank	Americas	Asia-Pacific	EMEA
1	Biometrics	Wireless security solutions	Wireless security solutions
2	Wireless security solutions	Intrusion detection	Storage security
3	Business continuity and disaster recovery solutions	Business continuity and disaster recovery solutions	Biometrics
4	Intrusion detection	Biometrics	Risk management solutions
5	Cryptography	Cryptography	Business continuity and disaster recovery solutions



# MondoRescue

A GPL Disaster Recovery Solution



- Distribution neutral (Mandriva, RedHat, Fedora, RHEL, OpenSuSE, SLES, Debian, Ubuntu, Gentoo, Slackware) – x86, x86\_64, ia64
- Supports most FS supported by the kernel (ext2/3/4, reiserfs, XFS, NTFS, [V]FAT, NFS, including dual boot systems) on any disk supported (IDE, SCSI, FC, HW Raid, SW Raid, LVM v1/2, DM, Multipath) and boot loader (lilo/grub/elilo)
- Supports CD-R[W], DVD[-+]R[W], Tapes, USB disks/keys, NFS, local FS (ISO9660 files)
- Uses mindi for mini-distro (live backup !)
- Full or differential backups supported
- CLI + curses based UI
- System DR in minutes





# MondoRescue

The user's view



- Need for a Rescue CD for Linux pre-installed servers in 2000
- 2 choices: mkCDrec and Mondo Rescue
- Mondo Rescue nearer to my initial needs
- Developer happy to receive patches
- -H option added

The screenshot shows a web browser window displaying the Mondo Rescue website. The browser's address bar shows the URL `http://www.mondorescue.org/`. The website has a navigation menu with links for Home, About, News, Docs, Downloads, Artwork, Support, Wiki, and Thanks. The main content area features the Mondo Rescue logo and the heading "Mondo Rescue Home Page". Below this is a section titled "What is Mondo Rescue ?" which contains a terminal window. The terminal window displays the following text:

```
WELCOME TO MONDO RESCUE
Backup to:
CD-R disks  CD-RW disks
DVD disks  CD streamer
Tape
Please choose the backup media

WELCOME TO MONDO RESCUE
Making catalog of files to be backed up
Dividing
Copying M
Calling M
Preparing
Archiving
I am backing up your live filesystem now.
Please wait. This may take a couple of hours.
CDR 1: [*****.....] 23% used
3:14 taken      82:35 remaining
3% done        97% to go

Writing boot and data disk images were created.
Boot-data disks were created OK
Archiving regular files
I am backing up your live filesystem now.
```

Below the terminal window, the text reads: "Mondo Rescue is a GPL disaster recovery solution. It supports Linux (i386, x86\_64, ia64) and FreeBSD (i386). It's packaged for multiple distributions (RedHat, RHEL, SuSE, SLES, Mandriva, Debian, Gentoo). It supports tapes, disks, network and CD/DVD as backup media, multiple filesystems, LVM, software and hardware Raid."



# MondoRescue

## Archiving with mondoarchive



- Uses either bzip2, gzip or lzo for data compression
- Uses afio for reliable backup (supports compression on a file basis, ASCII headers, cpio comp.)
- Generates bootable ISO images or burns media/creates tapes or USB disks, using running kernel + modules
- Saves disk structure and content. Proliant HW information
- Runs on a live system



```
/usr/sbin/mondoarchive -O -d /bkp -s 700M -p m1 -E "/usr/doc /usr/src" -N -T /tmp -n s1.hpintelco.org:/nfs
```

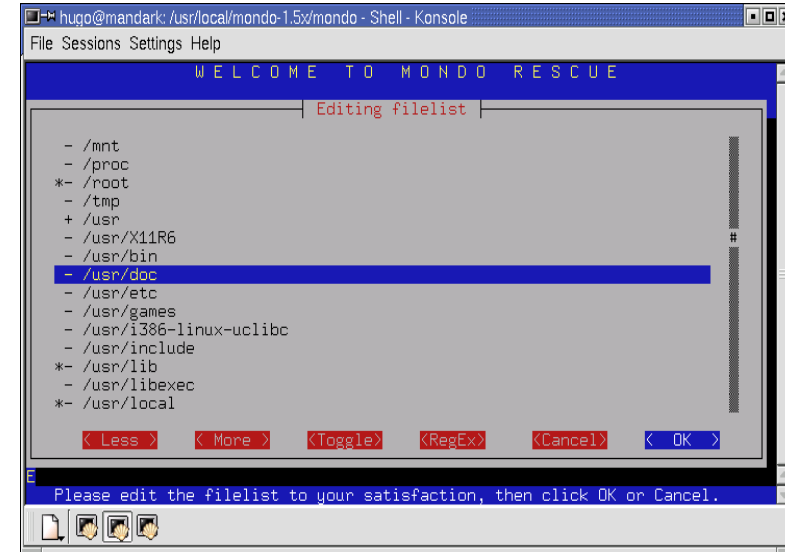


# MondoRescue

## Restoring with mondorestore



- From bootable physical media (CDs, tapes, OBDR since 2.2.6, USB devices), images on disks, network (PXE), virtual media (Proliant specific)
- Interactive restore from image files under the OS
- Proliant goodies support
- Various modes: Automatic, Interactive, Expert, Compare
- Ability to change FS type, layout, SW Raid, even HW configuration.
- DR restore in minutes. But do it !







# MondoRescue

## Cloning support



- Requires knowledge of master and target platforms (potential different drivers)
- All drivers should be part of the mindi image created (either used on master or forced in mindi)
- Use -H if master and target are identical hardware platforms
- In other cases, all functions are also available (partition resizing, filesystem type change ...) + hardware adaptation
- Improvement for mindi to include all drivers – TBC





- First patch in Dec. 2000
- First attempt of ia64 port not published back in 2001, then in Apr. 2004, and finally published in Nov. 2007
- Proliant fixes in Nov. 2004
- Then migration from CVS => SVN
- PXE support added in Apr. 2005
- Then no working SVN (1 year+)
- Patched 2.04 version in Sep. 2005





# MondoRescue

## PXE Support



- Using PXE boot ROM, ability to integrate MondoRescue images with a generic deployment server based on pxelinux.
- Ability to boot from a (central) server hosting (all) ISO images without physical media.

label mondo

```
kernel kernel/vmlinuz-mondo
```

```
append root=/dev/ram rw pxe
```

```
initrd=initrd/initrd-mondo.img
```

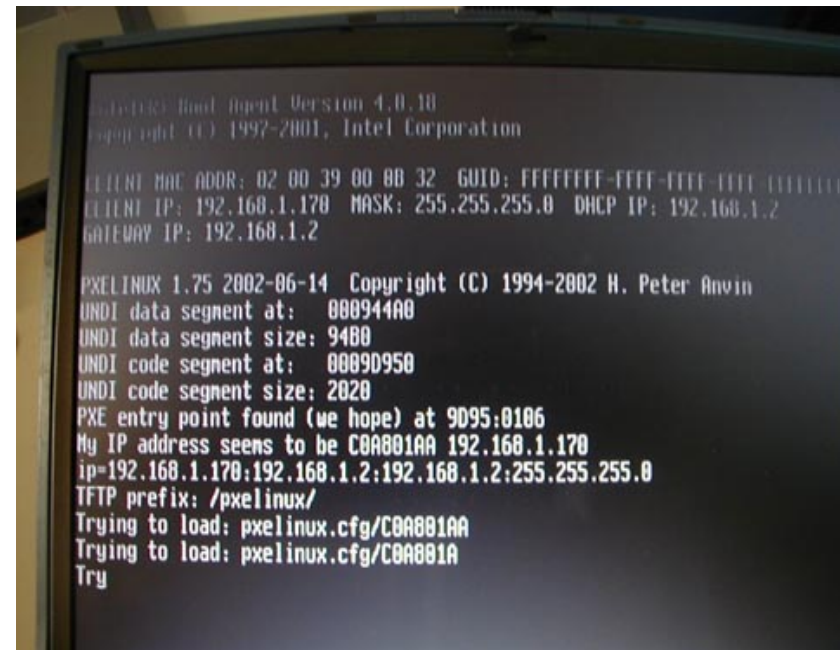
```
ramdisk_size=32768 prefix=m1
```

```
load_ramdisk=1 prompt_ramdisk=0
```

```
ipconf=eth1:192.168.0.1:255.255.255.
```

```
0:192.168.0.255:192.168.0.254
```

```
nfsmount=192.168.0.10:/mondo ping=5
```





# MondoRescue

## Proliant Features



- With the iLO and Virtual Media function, ability to boot from a (central) server hosting (all) ISO images or a laptop through a Web interface without physical media.
- Smart Array support
- Proliant NIC support
- Hardware info backup & recovery possible in a cloning approach (using hpacucli, hponcfg, conrep from SSSTK) – preliminary support in 2.2.5





# MondoRescue

## The Maintainer's View



- Project Maintainer since Oct. 2005
- New subversion repository (Thanks BerliOS – HP)
- 15 versions published with 2.2.8
- New Build process (Generated pkgs => lead to project-builder.org)
- 60 distribution tuples (Thanks Qemu)
- New Website (Thanks Ayo)
- Trac (300+ Bugs declared – half fixed already)
- Mondorescue HOWTO Rewritten
- Mailing List activity

The screenshot shows a web browser window displaying the MondoRescue Trac website. The address bar shows 'http://trac.mondorescue.org/'. The page features a navigation menu with links for 'Wiki', 'Timeline', 'Roadmap', 'Browse Source', 'View Tickets', and 'Search'. A 'Protected by M^NDO' badge is visible. The main content area includes a 'Welcome to Mondo Rescue devel pages' message, a note about editability, and a 'Starting Points' section with links to the website, documentation, and Debian BTS. A 'Contents' section lists various topics like 'Boot Process Unraveled' and 'Distribution Packaging'.





# MondoRescue

Project Lead: 2.2.5



- bug fixes on 2.2.4
- Better Ubuntu and Debian support
- Proliant SSSTK support
- ia64 support
- USB key support
- Udev support
- Use Project Builder

Timeline - MondoRescue - Trac - Mozilla Firefox

http://trac.mondorescue.org/timeline

Protected by MONDO

logged in as bruno | Logout | Settings | Help/Guide | About Trac | My Account

Timeline

View changes from 05/19/08 and 30 days back.

- Milestones
- Ticket changes
- Repository checkins
- Wiki changes

Update

**05/17/08:**

- 02:34 Changeset [1940] by bruno  
Improve log when errors on ext. attr.
- 01:29 Changeset [1939] by bruno  
svn merge -f 1923:1938 \$SVN\_M/branches/2.2.6
- 01:16 Changeset [1938] by bruno  
Better instructions for getting support (test versions, size of ...)

**05/15/08:**

- 16:44 Ticket #252 (defect) created by zoltak  
shm always being used and crashes mondo when out of space
- 13:58 Changeset [1937] by bruno  
Attempt to fix problem with SuSE 10.2 boot loader not reinstalled - may ...

**05/11/08:**

- 23:48 Changeset [1936] by bruno  
Removal of useless tools and distributions dir

**05/08/08:**

- 02:14 Changeset [1935] by bruno  
- remove useless files

**05/07/08:**

- 15:08 Changeset [1934] by bruno  
Handle part of #250
- 14:54 Changeset [1933] by bruno  
Attempt to fix #249 (adding START and STOP headers systematically for ...)
- 11:54 Changeset [1932] by bruno  
Attempt to solve #244 by ignoring SIGPIPE during big file restore with ...
- 11:37 Changeset [1931] by bruno  
Remove the useless g\_sigpipe\_caught bool

**05/06/08:**

Rechercher : osrb

Suivant Précédent Surligner tout Respecter la casse Phrase non trouvée

Terminé



# MondoRescue

Project Lead: 2.2.6



- bug fixes on 2.2.5
- Gentoo x86\_64 support
- Better tape support (-G)
- OBDR support
- Remove floppy support
- New cli params for mondorestore

The screenshot shows the Trac Roadmap page for MondoRescue. The browser window title is "Roadmap - MondoRescue - Trac - Mozilla Firefox". The address bar shows "http://trac.mondorescue.org/roadmap". The page features a navigation menu with options like "Wiki", "Timeline", "Roadmap", "Browse Source", "View Tickets", "New Ticket", "Search", and "Admin". The main content area displays four milestones:

- Milestone: 2.2.6** (No date set): 3% progress, 1 closed ticket, 37 active tickets.
- Milestone: 3.0.0** (No date set): 11% progress, 1 closed ticket, 8 active tickets. Description: "Major rewrite containing new memory management (dynamic allocation), configuration files, escape strings, ..."
- Milestone: 3.0.1** (No date set): 0% progress, 0 closed tickets, 4 active tickets.
- Milestone: 3.0.2** (No date set): 0% progress, 0 closed tickets, 15 active tickets.

At the bottom, there is a search bar with "osrb" entered, a "Rechercher" button, and a "Terminé" status. The footer includes the Trac logo, "Powered by Trac 0.9.6 By Edgewall Software", and a note that the project is hosted by HP Intel Solution Center on a Mandriva system.



# MondoRescue

Project Lead: 2.2.7



- bug fixes on 2.2.6
- Improve USB support
- Fix for debian x86\_64
- Support labeled reiserfs FS
- Remove shm usage
- OCFS2 preliminary support
- -E/-I support devices

Milestone 2.2.7 - MondoRescue - Trac - Mozilla Firefox

http://trac.mondorescue.org/milestone/2.2.7

Protected by MONDO

Milestone 2.2.7  
Completed 3 months ago (10/13/08 01:39:03)

Closed tickets: 31 Active tickets: 0

100%

Look at <http://trac.project-builder.org/browser/projects/mondorescue/pbconf/branches/2.2.7/mindi/pbcl>,  
<http://trac.project-builder.org/browser/projects/mondorescue/pbconf/branches/2.2.7/mondo/pbcl> and  
<http://trac.project-builder.org/browser/projects/mondorescue/pbconf/branches/2.2.7/mondo-doc/pbcl> for details.

Ticket status by Component

Mindi	8/8
Mindi-busybox	1/1
Mondo	22/22

Note: See [TracRoadmap](#) for help on using the roadmap.

Powered by Trac 0.10.4 By Edgewall Software

The Mondo Rescue project is hosted by the HP Intel Solution Center on a Mandriva system.







# MondoRescue

## Project Lead: 2.2.8



- bug fixes on 2.2.7
- Ext4 support added
- Fix OBDR on ia64
- Adds 2.6.27 support
- Adds multipath support
- Adds RHAS 2.1 support

Roadmap - MondoRescue - Trac - Mozilla Firefox

http://trac.mondorescue.org/roadmap

Protected by MONDO

Search

Login Settings Help/Guide About Trac Register

Wiki Timeline Roadmap Browse Source View Tickets Search Tags Blog

### Roadmap

Show already completed milestones

**Milestone: 2.2.8**  
No date set

46%

Closed tickets: 12 Active tickets: 14

**Milestone: 2.2.9**  
No date set

0%


Closed tickets: 0 Active tickets: 2

**Milestone: 3.0.0**  
No date set

0%

Closed tickets: 0 Active tickets: 17

Major rewrite containing new memory management (dynamic allocation), configuration files, escape strings, ...





# MondoRescue

Project Lead: 2.2.9



- bug fixes on 2.2.8
- Pre and post scripts
- Proliant DL160 G6 PXE (igb + e1000e, sata\_via, ...)
- ia64 improvements (serial mode, parted2fdisk)
- SuSE ramdisk support
- Increased mountlist limit
- Inactive VGs not restored
- Memory mangement improvements (some)
- NFS user + mount support

The screenshot shows the Trac Roadmap page for MondoRescue. The browser window title is "Roadmap - MondoRescue - Trac - Mozilla Firefox". The address bar shows "http://trac.mondorescue.org/roadmap". The page features a navigation menu with "Roadmap" selected. The main content area displays three milestones:

- Milestone: 2.2.8** (No date set): 46% progress. Closed tickets: 12, Active tickets: 14.
- Milestone: 2.2.9** (No date set): 0% progress. Closed tickets: 0, Active tickets: 2.
- Milestone: 3.0.0** (No date set): 0% progress. Closed tickets: 0, Active tickets: 17.

Below the milestones, there is a description: "Major rewrite containing new memory management (dynamic allocation), configuration files, escape strings, ...". A small MondoRescue logo is visible in the bottom right corner of the page.



# MondoRescue

Project Lead: 3.0.0



- Rewritten in perl (mindi first)
- Busybox removal
- OS independance (FreeBSD)
- Network protocol and setup independance
- Internationalization (fr,us)
- Configuration files
- Support of all FS/LVM options
- SELinux/EFIbootmgr support
- Software Engineering (tests programs, splint, valgrind, fossology...)

Custom Query - MondoRescue - Trac - Mozilla Firefox

http://trac.mondorescue.org/query?status=new&status=...

Protected by MONDO

logged in as bruno | Logout | Settings | Help/Guide | About Trac | My Account

Custom Query (8 matches)

Filters: Status  new  assigned  reopened  closed  
Milestone is 3.0.0

Group results by [ ] descending  Show full description under each result

Ticket	Summary	Status	Owner	Type	Priority	Component
108	/dev fills up to 100% and stops	assigned	bruno	defect	high	mondo
67	mondoarchive should have an option to select NIC	new	bruno	enhancement	normal	mondo
94	Show Command Assembled in GUI	new	bruno	enhancement	normal	mondo
141	Packages should be signed	new	bruno	enhancement	normal	mondo
152	Bootable USB that backs up to DVDs	assigned	bruno	enhancement	normal	mindi
153	pre+post script & answer file	new	bruno	enhancement	normal	mondo
235	FTP support	assigned	bruno	enhancement	normal	mondo
131	Exclude /var/log/lastlog from mondoarchive ?	assigned	bruno	enhancement	low	mondo

Note: See [TracQuery](#) for help on using queries.

Download in other formats: [XML](#) [RSS Feed](#) [Comma-delimited Text](#) [Tab-delimited Text](#)

Powered by Trac 0.9.6 By Edgewall Software

The Mondo Rescue project is hosted by the HP Intel Solution Center on a Mandriva system.

Rechercher : osrb

Terminé



# MondoRescue

Web Resources



Mondorescue main site

<http://www.mondorescue.org>

Trac / Wiki

<http://trac.mondorescue.org>

Busybox

<http://www.busybox.net>

Project-Builder

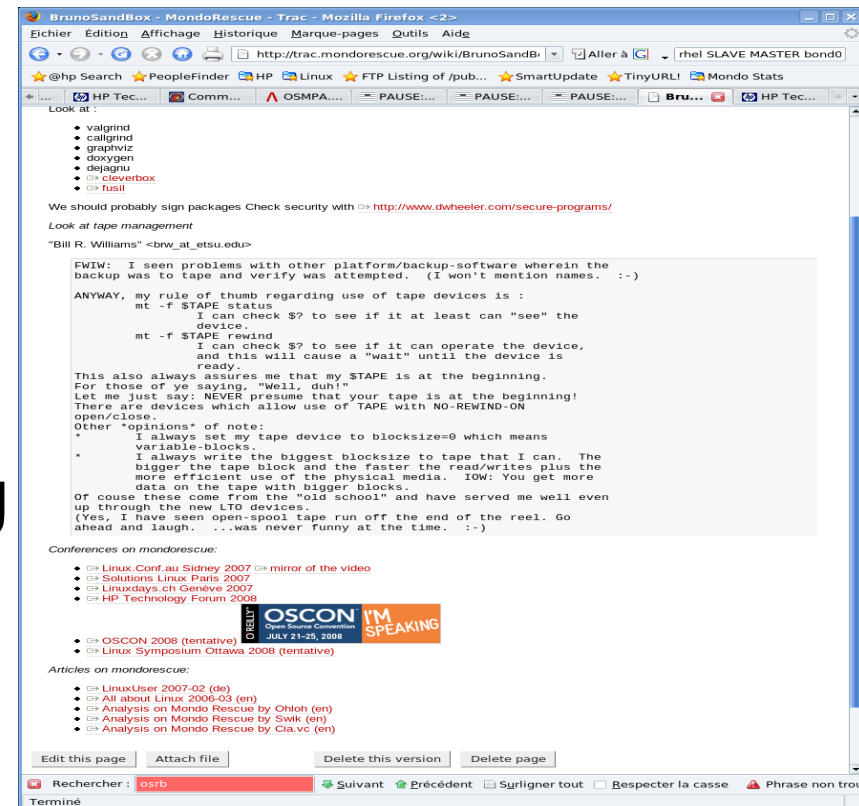
<http://trac.project-builder.org>

Open Source at HP

<http://opensource.hp.com>



*"The evolution of FLOSS and the Internet are tightly coupled"*





# MondoRescue

## Contact - Thanks



[Bruno.Cornec@hp.com](mailto:Bruno.Cornec@hp.com)

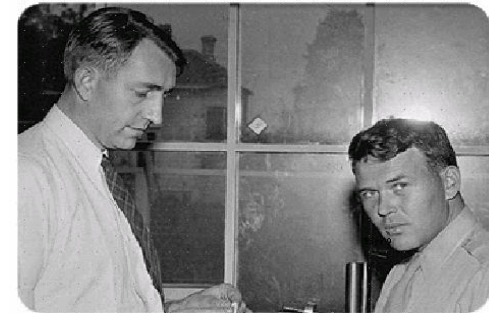
(Open Source and Linux Technology Architect  
at the HP/Intel Solution Center)

<http://www.hp.com/linux>

<http://opensource.hp.com>

Thanks goes to:

Linus Torvalds, Richard Stallman, Eric Raymond, Nat Makarevitch, René Cougnenc, Eric Dumas, Rémy Card, Hugo Rabson, Bdale Garbee, Bryan Gartner, Craig Lamparter, Lee Mayes, Gallig Renaud, Andree Leidenfrost, Phil Robb, Bob Gobeille, Martin Michlmayr among others, for their work and devotion to the Open Source Software cause... and my family for their patience :-)



"Changes are never easy to make. There is comfort and safety in tradition, but change must come, no matter how painful or expensive it may be."

*Bill Hewlett*

