

# Next CERN Linux version

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**CERN Linux**

<http://cern.ch/linux> [linux.support@cern.ch](mailto:linux.support@cern.ch)

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# CEL3 - CERN E. Linux 3

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- ✓ Recompiled from Red Hat Enterprise Linux 3 sources
  - ✓ E. = {Enterprise|Enhanced|Experimental}
- ✓ Available for
  - ✓ i686/athlon
  - ✓ IA64 (Itanium 2)
  - ✓ AMD64 (Opteron)



# CEL3 Customizations

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- ✓ All packages included
  - ✓ From RHEL 3 AS/ES/WS versions
  - ✓ Also these not shipped by Red Hat
- ✓ Custom kernel
  - ✓ Added CERN patches
    - ✓ XFS file system, driver updates
  - ✓ Additional kernel modules
    - ✓ Wireless network cards ...



# CEL3 Customizations

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- ✓ Replaced system update mechanism
- ✓ Added packages
  - ✓ Openafs (with Krb IV), Heimdal Krb 5
  - ✓ CASTOR
  - ✓ Pine, zephyr ...
- ✓ Adapted configuration wizards
  - ✓ CERN printing wizard
  - ✓ Modified firewall setup



# CEL3 Customization

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- ✓ Adapted first system boot wizard
  - ✓ Added CERN specific options
- ✓ Added configuration management system
- ✓ Kernel 2.6 ready
  - ✓ 2.6 provided for tests



# Software Management

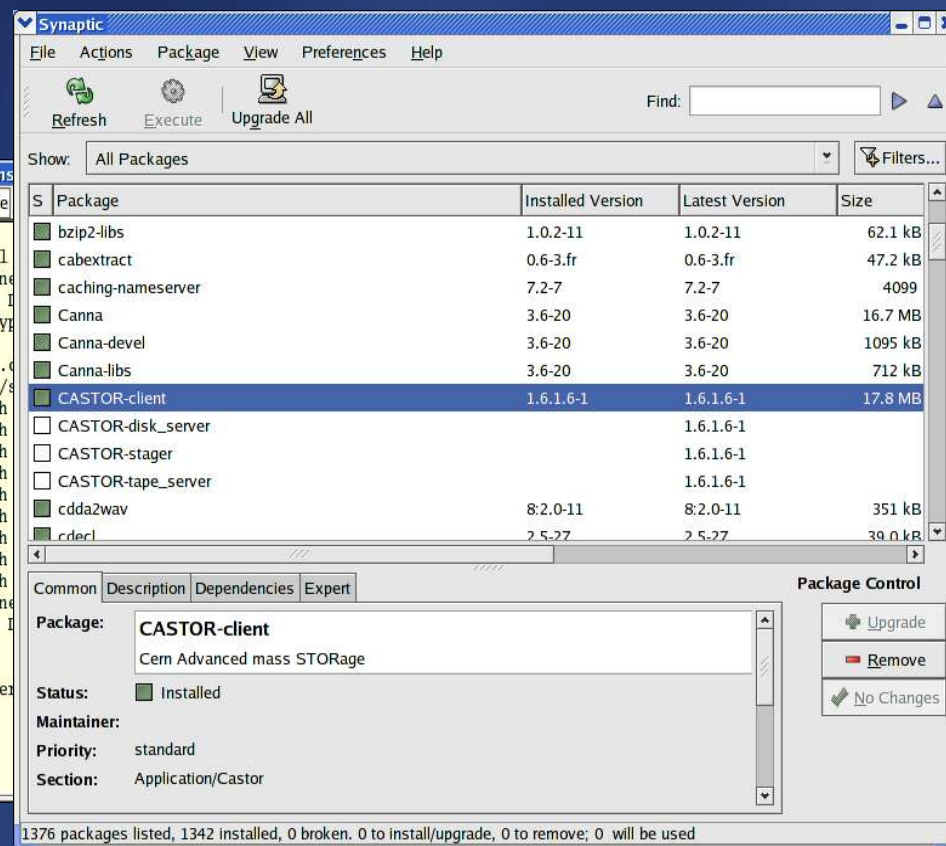
✓ Based on APT (Advanced Package Tool)

✓ Command Line interface

✓ Graphical interface

✓ CERN written  
configurable  
automatic  
update  
mechanism

```
jarek@lart:/home/jarek - Root Console  
[root@lart jarek]# apt-shell  
Reading Package Lists... Done  
Building Dependency Tree... Done  
Welcome to the APT shell. Type  
apt> update  
Get:1 http://linuxsoft.cern.ch/ [ ... ]  
Hit http://linuxsoft.cern.ch/ [ ... ]  
Hit http://linuxsoft.cern.ch/ [ ... ]  
Hit http://linuxsoft.cern.ch/ [ ... ]  
Hit http://linuxsoft.cern.ch/ [ ... ]  
Hit http://linuxsoft.cern.ch/ [ ... ]  
Hit http://linuxsoft.cern.ch/ [ ... ]  
Hit http://linuxsoft.cern.ch/ [ ... ]  
Hit http://linuxsoft.cern.ch/ [ ... ]  
Hit http://linuxsoft.cern.ch/ [ ... ]  
Hit http://linuxsoft.cern.ch/ [ ... ]  
Hit http://linuxsoft.cern.ch/ [ ... ]  
Hit http://linuxsoft.cern.ch/ [ ... ]  
Reading Package Lists... Done  
Building Dependency Tree... Done  
apt> upgrade  
apt> install lcm  
lcm is already the newest version.  
apt>
```



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# APT – Advanced Package Tool

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- ✓ Connectiva port of Debian apt to rpm
- ✓ Automatic dependency solving
- ✓ Multiple repository setup
- ✓ Highly extensible/customizable
  - ✓ Embedded LUA scripting capabilities
- ✓ Popular for 3<sup>rd</sup> party repositories (freshrpms etc)
  - ✓ Being integrated into Fedora Core





Synaptic

File Actions Package View Preferences Help

Refresh Execute Upgrade All

Find:

date the list of available packages

S	Package	Installed Version	Latest Version	Size
<input type="checkbox"/>	ami	1.2.2-3	1.2.2-3	963 kB
<input type="checkbox"/>	am-utils	5:6.0.9-2	5:6.0.9-2	1699 kB
<input type="checkbox"/>	anaconda	9.1.1-7.2.cern	9.1.1-7.2.cern	9557 kB
<input type="checkbox"/>	anaconda-help	9.1-3.RHEL	9.1-3.RHEL	1509 kB
<input type="checkbox"/>	anaconda-images	9.1.cern-2	9.1.cern-2	749 kB
<input type="checkbox"/>	anaconda-product	3.cern-1	3.cern-1	394 kB
<input type="checkbox"/>	anaconda-runtime	9.1.1-7.2.cern	9.1.1-7.2.cern	841 kB
<input type="checkbox"/>	apel	10.4-3	10.4-3	456 kB
<input type="checkbox"/>	apel-xemacs	10.4-3	10.4-3	498 kB
<input type="checkbox"/>	apmd	1:3.0.2-18	1:3.0.2-18	99.2 kB
<input type="checkbox"/>	apt	0.5.15cnc5-2.cern	0.5.15cnc5-2.c	
<input type="checkbox"/>	apt-cern	2:1-4.cern	2:1-4.cern	
<input type="checkbox"/>	apt-devel	0.5.15cnc5-2.cern	0.5.15cnc5-2.c	
<input type="checkbox"/>	arc	1-5.cern	1-5.cern	
<input type="checkbox"/>	arc-server	1-5.cern	1-5.cern	
<input type="checkbox"/>	aptables-if	0.0.5.0.2E	0.0.5.0.2E	

Common Description Dependencies Expert

Package: No package is selected.

Status:

Maintainer:

Priority:

Section:

1357 packages listed, 1328 installed, 0 broken. 0 to install/upgrade, 0 to remove; 0 will be used

Execute Upgrade All

radable

02

47 I

47 that

- No Changes
- Install
- Upgrade**
- Remove
- Remove Including Orphaned Dependencies
- Hold Current Version

Summary

**Execute the following changes?**

This is your last opportunity to look through the list of queued changes before they are executed.

**To be upgraded**

- rpmdb-redhat

**Summary** [Show Details](#)

- 1 package will be upgraded
- 12.4 kB of extra space will be freed
- 25.5 MB have to be downloaded

Download package files only



```
jarek@lart:/home/jarek - Root Console - Konsole
New Shell Root Console
Password:
[root@lart jarek]# apt-shell
Reading Package Lists... Done
Building Dependency Tree... Done
Welcome to the APT shell. Type "help" for more information.
apt> update
Get:1 http://linuxsoft.cern.ch apt/cern/cel3/en/i386 release [1310B]
Fetched 1310B in 0s (43.4kB/s)
Hit http://linuxsoft.cern.ch apt/cern/cel3/en/i386/os srclist
Hit http://linuxsoft.cern.ch apt/cern/cel3/en/i386/updates srclist
Hit http://linuxsoft.cern.ch apt/cern/cel3/en/i386/extras srclist
Reading Package Lists... Done
Building Dependency Tree... Done
[root@lart jarek]# apt-get upgrade
Reading Package Lists... Done
Building Dependency Tree... Done
0 upgraded, 0 newly installed, 0 removed and 0 not upgraded.
[root@lart jarek]# apt-get install apt-devel
Reading Package Lists... Done
Building Dependency Tree... Done
The following NEW packages will be installed:
  apt-devel (0.5.15cnc6-2.cern)
0 upgraded, 1 newly installed, 0 removed and 0 not upgraded.
Need to get 542kB of archives.
After unpacking 1696kB of additional disk space will be used.
Get:1 http://linuxsoft.cern.ch apt/cern/cel3/en/i386/os apt-devel 0.5.15cnc6-2.cern [542kB]
Fetched 542kB in 0s (3750kB/s)
Committing changes...
Preparing... ##### [100%]
  1:apt-devel ##### [100%]
Done.
[root@lart jarek]#
```

```
jarek@lart:/home/jarek - Root Console - Konsole
New Shell Root Console
Hit http://linuxsoft.cern.ch apt/cern/cel3/en/i386/os srclist
Hit http://linuxsoft.cern.ch apt/cern/cel3/en/i386/updates srclist
Hit http://linuxsoft.cern.ch apt/cern/cel3/en/i386/extras srclist
Reading Package Lists... Done
Building Dependency Tree... Done
[root@lart jarek]# apt-get upgrade
Reading Package Lists... Done
Building Dependency Tree... Done
0 upgraded, 0 newly installed, 0 removed and 0 not upgraded.
[root@lart jarek]# apt-get install apt-devel
Reading Package Lists... Done
Building Dependency Tree... Done
The following NEW packages will be installed:
  apt-devel (0.5.15cnc6-2.cern)
0 upgraded, 1 newly installed, 0 removed and 0 not upgraded.
Need to get 542kB of archives.
After unpacking 1696kB of additional disk space will be used.
Get:1 http://linuxsoft.cern.ch apt/cern/cel3/en/i386/os apt-devel 0.5.15cnc6-2.cern [542kB]
Fetched 542kB in 0s (3750kB/s)
Committing changes...
Preparing... ##### [100%]
  1:apt-devel ##### [100%]
Done.
[root@lart jarek]#
```



# Configuration Management

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✓ Quattor toolkit based

✓ Plus local extensions

✓ Allowing standalone operation

✓ Manual, weekly, daily and onboot actions

✓ Site defaults for:

✓ Openafs client

✓ Kerberos 4 and 5 setup

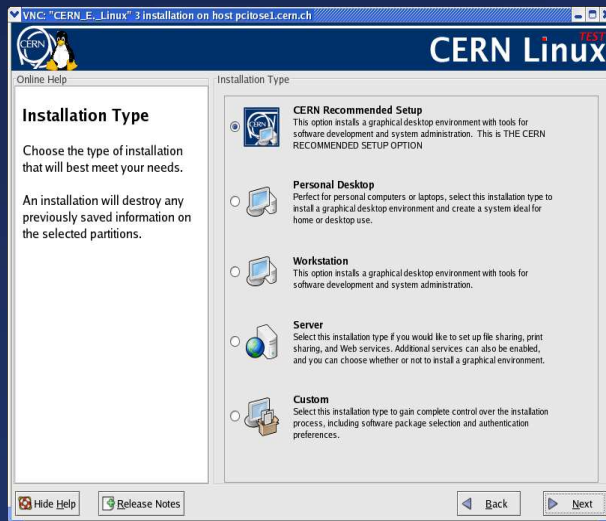
✓ ... other software packages (zephyr, pine ....)

✓ ...

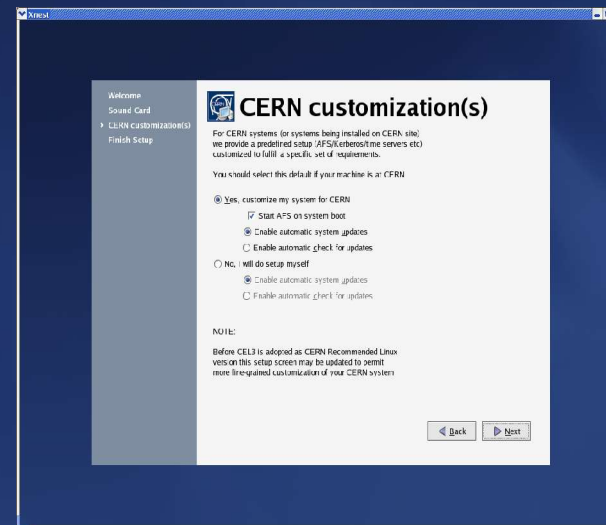


# (Few) Customization details

✓ Installation



“CERN Recommended Setup” choice



CERN Setup options on first boot



CERN Recommended Setup Workstation



CERN Linux

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Welcome

Sound Card

▶ CERN customization(s)

Finish Setup



## CERN customization(s)

For CERN systems (or systems being installed on CERN site) we provide a predefined setup (AFS/Kerberos/time servers etc) customized to fulfill a specific set of requirements.

You should select this default if your machine is at CERN

- Yes, customize my system for CERN
  - Start AFS on system boot
  - Enable automatic system updates
  - Enable automatic check for updates
- No, I will do setup myself
  - Enable automatic system updates
  - Enable automatic check for updates

### NOTE:

Before CEL3 is adopted as CERN Recommended Linux version this setup screen may be updated to permit more fine-grained customization of your CERN system

◀ Back

▶ Next



# (Few) Customization details

## ✓ Maintenance



check for updates (automatic or manual)

download of updates



CRS  
WS

Automatic installation

automatic update enabled

sysadmin e-mail notification

automatic update disabled - sysadmin e-mail notification

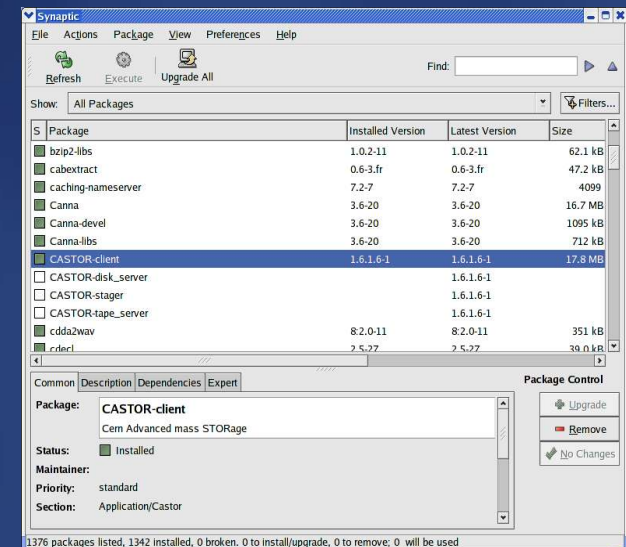


```
jarek@lart:/home/jarek - Root Console - Konsole
PINE 4.58 MESSAGE TEXT Folder: INBOX Message 1,246 of 1,248 ALL
Date: Fri, 5 Mar 2004 04:28:09 +0100
From: root <root@localhost.localdomain>
To: root@localhost.localdomain
Subject: [UPDATE] - SUCCESS on lart: Fri Mar 5 04:01:01 2004

System update on lart run at Fri Mar 5 04:01:01 2004 result:

Inst rpmdb-redhat [cel3-0.20040301] (cel3-0.20040303 NoName:cel3 en/CERN Linux)
Conf rpmdb-redhat (cel3-0.20040303 NoName:cel3 en/CERN Linux)

--
See: http://cern.ch/linux/updates for how to configure
your system for automatic updates
Linux.Support@cern.ch
```



Manual installation of updates (also additional software installation and removal)



CERN Linux

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# CERN Linux printing wizard

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Work in progress

- ✓ **CERN: Centrally managed print servers**
  - ✓ Using LPRng, providing DB of all printers
- ✓ **Printing clients**
  - ✓ LPRng: Not well integrated with desktop applications
  - ✓ CUPS: tightly integrated with applications
- ✓ **Wizard: Based on modified Red Hat application**
  - ✓ Using same infrastructure as CERN Windows printing wizard.
  - ✓ User-friendly way of configuring printers



**CERN Printer Wizard - lart**

Action Test Help

New Edit Delete Default Apply Fetch

Queue name	Default	Description
31-2401-HP	✓	added from CERN Printer Wizard
31-S025-HP		added from CERN Printer Wizard

**Edit a print queue**

Queue name Queue type Queue options Printer driver Driver options

Queue type: Networked UNIX (LPD)

Server: 31-2401-HP.print.cern.ch Queue: 31-2401-HP

Strict RFC1179 compliance

Help Cancel OK

available network printers:

Name	Model	Type
1	Xerox Phaser 6200B	PostScript
31-1012-BI	HP Business Inkjet 2280 PS	PostScript
31-1012-HP	HP LaserJet 4000 Series PS	PostScript
31-1029-DCI	HP LaserJet 4300 PS	PostScript
31-2020-HP	HP LaserJet 4050 Series PS	PostScript
31-2024-HP	HP LaserJet 4000 Series PS	PostScript
31-2025-HP	HP LaserJet 4000 Series PS	PostScript
31-2026-HP	HP LaserJet IIISI PostScript v52.3	PostScript
31-2-401-CM	HP 2500C Series PS3 Printer	PostScript Color A4
31-2401-HP	HP LaserJet 4050 Series PS	PostScript

Install Network Printers

Add printer to the configuration

Printer Types:

- <ALL>
- LaserJet
- LaserJet A3
- Plotter (HPGL)
- Plotter (HPGL2)
- Plotter (HPGL) A0
- PostScript
- PostScript A3
- PostScript A3/A4

Buildings:

- 25
- 26
- 27
- 28
- 29
- 30
- 31
- 32
- 33

Last database fetch: Thu May 6 11:53:08 2004

*Work in progress*



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# Red Hat Compatibility

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- ✓ It is the goal !
- ✓ Fermi LTS 30X / Whitebox ... others:
  - ✓ ALL should be binary compatible
  - ✓ If NOT -> Tell us ... it is a bug ... not feature ...
- ✓ Binary-only products compiled for RHEL  
3 AS/ES/WS should run
  - ✓ Maybe after some tweaking of /etc/redhat-release
  - ✓ But without support ....



# CEL3: Status & Availability

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20.05.2004

## ✓ **test1** version available

- ✓ For i686, ia64 and x86\_64, includes Red Hat Quarterly Update 1.
- ✓ CERN Site customization: 90% ready

## ✓ **test2** version mid June

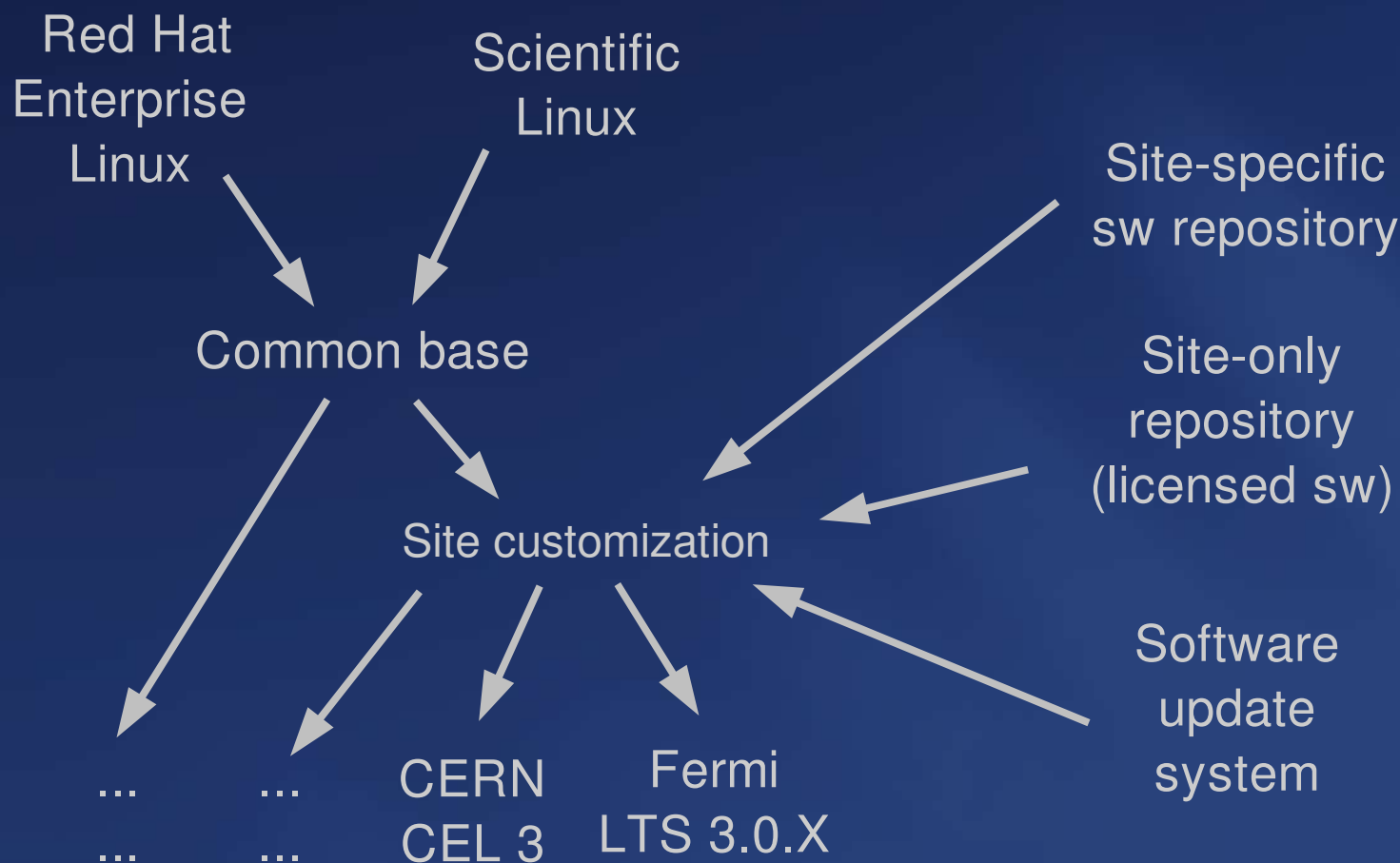
- ✓ Including Red Hat Quarterly Update 2
- ✓ Complete CERN Site customization

## ✓ **final** version end June

## ✓ Public interactive/batch test cluster(s) - June



# The (near ?) future



<http://cern.ch/linux/cel3>

NEW! CERN Linux 3 pages  
Linux Cert. C. - 9.03.2004

Questions?

The screenshot displays a Linux desktop environment with several windows open. At the top, a navigation bar includes 'CERN', 'IT Division', 'ADC Group', and 'CERN Linux Home'. A yellow banner on the right side reads 'NEW! CERN Linux 3 pages' and 'Linux Cert. C. - 9.03.2004'. The desktop background is a blue sky with clouds. On the left, there are icons for 'Floppy', 'Home', 'Start Here', and 'Fedora Legacy 7.3 (RPMS)'. A terminal window in the bottom-left corner shows a shell prompt and a directory listing of files and permissions. The central window is a presentation slide titled 'Software management' with a bulleted list of features: 'Based on APT (Advanced Package Mgmt.)', 'Command Line interface', 'Graphical interface', and 'CERN written configurable automatic update mechanism'. A 'Presentation' menu is open over the slide, showing options like 'Insert Slide...', 'Modify Slide Layout...', 'Slide Design...', 'Duplicate Slide', and 'Expand Slide'. In the background, an email client window shows an 'INBOX (692)' with a search filter for 'CERN'. The taskbar at the bottom shows several open applications: 'INBOX (692) - Ximian Evolution', '/linux/cel3/index.shtml (CERN Linux)', 'Konsole [9]', and 'Gimp [5]'. The system tray on the right shows the time as '16:01'.

- ✓ Based on APT (Advanced Package Mgmt.)
- ✓ Command Line interface
- ✓ Graphical interface
- ✓ CERN written configurable automatic update mechanism

**Presentation**

- Insert Slide...
- Modify Slide Layout...
- Slide Design...
- Duplicate Slide
- Expand Slide

```
[jarek@lart] cd /afs/cern.ch/project/linux/cern/cel3
[jarek@lart] ls
total 11
drwxr-xr-x 3 jpolok root 2048 Feb 10
drwxr-xr-x 3 jpolok root 2048 Feb 10
drwxr-xr-x 2 jpolok root 2048 Feb 10
-rw-r--r-- 1 jpolok c3 86 Feb 8
drwxr-xr-x 5 jpolok root 2048 Feb 8
-rw-r--r-- 1 jpolok c3 86 Feb 8
-rw-r--r-- 1 jpolok c3 137 Feb 8
[jarek@lart] pwd
/afs/cern.ch/project/linux/cern/cel3
[jarek@lart]
```

as a g... (dates)  
has low...  
ddy Lis...  
lies  
yone (...)  
Fu...  
Ar...  
M...  
Get In...