

# Debian AMD64 Proposal

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# 1 Introduction

## 1.1 Purpose

This document aims at outlining the port of Debian to the AMD64 architecture (previously known as x86-64 and Hammer).

The intent is to provide the porting team, and other interested parties, an informal porting guideline and a list of packages that are to be ported.

The AMD Developer Center granted the porting team use of one of their systems for the purpose of the port. This document also aims at providing the AMD Developer Center a plan on how the porting team will use the resources. Unless otherwise specified this document will refer to this system as “the build system.”

## 1.2 Scope

This document provides a rough guideline for the porting team. It is not to be considered a definitive time-line of events. It is expected that the project will be very fluid and specifics will change as time goes on.

## 1.3 Project Goals

The Debian AMD64 porting project sets out to create a Debian release targeted at the AMD64, and specifically at the 64-bit mode or Long-mode.

Initially the project will not be self-bootstrapping and will require that a 32-bit version of Debian be running on the system. Eventually, the team hopes to release a set of ISO images for direct installation onto an AMD64 system.

## 1.4 Web Presence

The project is already under way. Interested parties should be familiar with the following web pages and email addresses:

- Official Project Mailing List  
*<http://lists.debian.org/debian-x86-64/>*
- Alioth Project Page  
*<http://alioth.debian.org/projects/debian-x86-64/>*

A few project members maintain some information related to this project on their personal web pages, these are listed here:

- *<http://www.arndb.de/debian/>*
- *<http://www.jukie.net/bart/debian/amd64/>*

There is a plan to utilize the Debian wiki facilities for other contributions:

- *<http://wiki.debian.net/>*

## 2 Organization

This section of the document describes the initial requirements of the Debian AMD64 porting team. Please note that as of this documents' creation some of the requirements are already fulfilled.

### 2.1 The Build System

The porting team will require the following configuration from the AMD Developer Center to start:

- SuSE 64-bit system on Opteron hardware (ie the build system)
- chrooted 32-bit Debian/Sarge
- serial console access from another box/terminal server/etc.
- a remote-access power switch to the build system
- ssh access to the build system

### 2.2 Porting Team

The AMD Developer Center granted five (5) developers access to the build machine; these individuals are listed below:

- Kurt Keville
- Arnd Bergmann
- Bart Trojanowski
- Falk Hüffner
- Roland Fehrenbacher

Note that this list does not limit other from contributing to the project.

### 2.3 Team Communication

The porting team will use the official mailing list *debian-x86-64@lists.debian.org*.

Packages will be made available and exchanged via the Alioth Project page <http://alioth.debian.org/projects/debian-x86-64/>.

## 2.4 Port Name

The Opteron is the first publicly available implementation of the AMD64 bit architecture. This architecture used to be referred to as Hammer and x86-64.

An AMD representative suggested that we do go with AMD64. Since the Hammer name is no longer used to describe the architecture, and the x86-64 has the underscore vs dash problem (ie x86-64 vs x86\_64), this suggestion was agreed to by the porting team.

Since the tool-chain and glibc were ported in the era of x86-64 naming scheme, those tools will (probably) forever use x86-64 to name this architecture. The porting team will have to keep this in mind when working on certain packages.

The final Debian package names will take a form of *\*\_amd64.deb*.

## 3 Initial Build System

This section of the document describes the steps that will be taken by the porting team, specifically on the build system, before any .deb's can be ported.

The sections that follow assume that actions taken only influence the 32-bit Debian/Sarge chrooted environment.

### 3.1 Mixed 32/64-bit Platform

One of the big pluses of the AMD64 architecture for Debian is it's concurrent support for AMD64 and i386. It is the plan to initially port only the "important" and "interesting" packages to AMD64 while leaving the remainder of the applications as i386 (ie nothing will be done to these packages). The Debian user running on an AMD64 would have the appropriate sources list for both package databases.

While running a 64-bit SuSE kernel, it should be possible to install, build, and run simple 32-bit Debian applications.

Having a functional chrooted environment will conclude this step.

### 3.2 64-bit Tool Chain

Arnd Bergmann's biarch (i386 and amd64) compiler should be installed on the build system. With this setup it should be possible to build functional 64-bit applications.

### 3.3 64-bit Kernel

Given a functional 64-bit toolchain, it should be possible to build a working 2.4.20+ kernel.

## 4 Initial release

This section of the document qualifies what the porting team will consider an *initialrelease*. This release will be the first advertised release of AMD64, while still considered 'unstable'.

It is the hope of the author that this release could be advertised at OLS/2003.

The initial release will contain 64-bit ports for at least those packages marked as priority required, important and standard. There are approximately 160 said packages. A more detailed list can be found on <http://www.jukie.net/bart/debian/amd64/proposal/>.

Some of the packages listed may be superceded by newer versions or even be replaced by packages that have different names.

### 4.1 Core Libraries

The first porting effort will be that of porting the core libraries. At the completion of this stage the Debian AMD64 port will consist of, at minimum, the following library packages:

```
console-tools-libs
libblkid1
libc6
libcap1
libdb1
libdb2
libdb3
libdb4
libdns5
libdns8
libgcc1
libgdbmg1
libident
libisc4
libldap2
liblockfile1
liblwres1
libncurses5
libnewt0
libnss-db
libpam-modules
libpam-runtime
libpam0g
libpcre3
libperl
libperl
libpng2
libpopt0
```

libreadline  
libsasl  
libssl  
libstdc++  
libwrap0  
zlib1g

A more current list can be found on  
<http://www.jukie.net/~bart/debian/amd64/proposal/packages.libs>.

As outlined by the LSB, the 32-bit libraries will exist in the `/lib` directory, while the 64-bit variants will live in `/lib64`.

At this point it should be possible to run simple C programs against the ported libraries.

## 4.2 Autobuilder Requirements

Autobuilder (sbuild) will help tremendously in the porting process. After having ported the core libraries, the porting team will concentrate on the packages which are required by sbuild. These are as follows:

binutils  
coreutils  
cpio  
cpp  
cron  
debconf  
debianutils  
g++  
gcc  
gcc  
libsasl2  
login  
make  
passwd  
patch  
perl  
perl-base  
perl-modules  
slang1

A more current list can be found on  
<http://www.jukie.net/~bart/debian/amd64/proposal/packages.pre-sbuild>.

## 4.3 Running Autobuilder

This stage is not well defined. There may be some unforeseen problems that will arise when setting up the autobuilder.

## 4.4 Remaining Core Packages

The majority of the packages are in this stage of the build. The following packages will be ported with the help of autobuilder.

```
adduser
apt
at
bc
biff
bin86
bind9-host
binutils
bison
bsdmainutils
console-common
console-data
console-tools
cpio
cpp
cron
dc
debconf
dictionaries-common
dnsutils
doc-debian
doc-linux-text
dpkg-dev
dselect
ed
exim
file
fileutils
finger
flex
ftp
g++
gcc
gdb
gettext-base
gnupg
gnupg-doc
groff-base
iamerican
ibritish
ifupdown
info
```

ipchains  
ipmasqadm  
iptables  
ispell  
klogd  
less  
lilo  
locales  
logrotate  
lpr  
lsof  
lynx  
m4  
mailx  
make  
makedev  
man-db  
manpages  
manpages-dev  
mawk  
mbr  
mime-support  
modutils  
mpack  
mtools  
mtr-tiny  
mutt  
nano  
ncurses-term  
net-tools  
netbase  
netkit-inetd  
netkit-ping  
nfs-common  
nvi  
passwd  
patch  
perl  
perl-modules  
pidentd  
portmap  
procmail  
procps  
python  
python-newt  
rcs

reportbug  
setserial  
sharutils  
shellutils  
slang1  
ssh  
strace  
sysklogd  
tcpd  
tcsch  
telnet  
texinfo  
textutils  
time  
vacation  
wenglish  
whiptail  
whois

A more current list can be found on  
*<http://www.jukie.net/~bart/debian/amd64/proposal/packages.rest>*.

## 5 Future Work

The plan post initial release is still up in the air. Upon the successful conclusion of the “initial releases” the porting team will reevaluate this section of the document.

Currently the following ideas have been proposed for future work:

1. Hack dpkg to understand the new architecture.
2. Make the ftp people create the new architecture in the archive.
3. Ability to build a 2.5.x 64-bit kernel natively.
4. Install CD.