

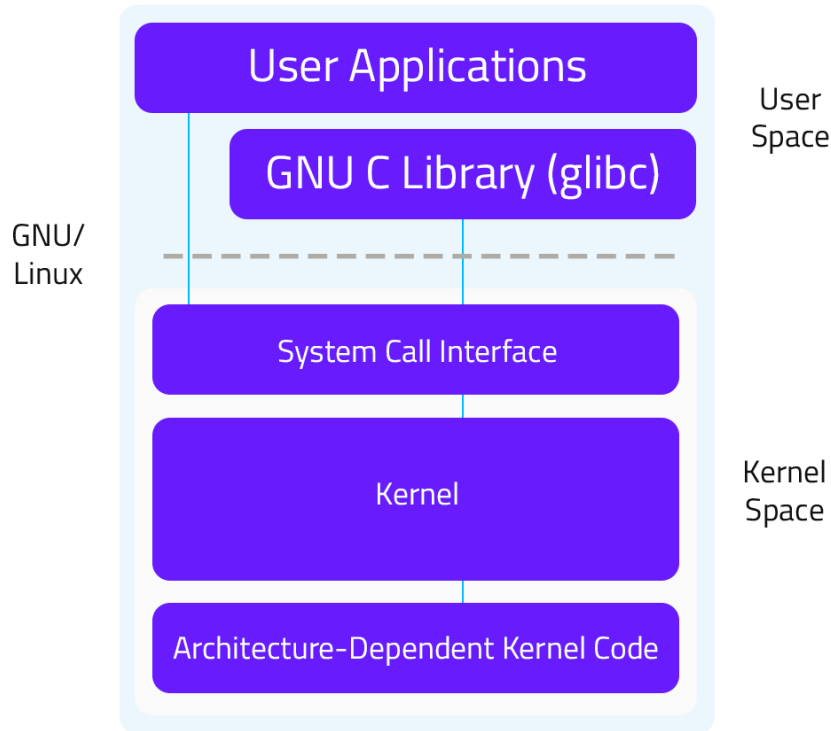
# Linux

One Operating System, Many Variants

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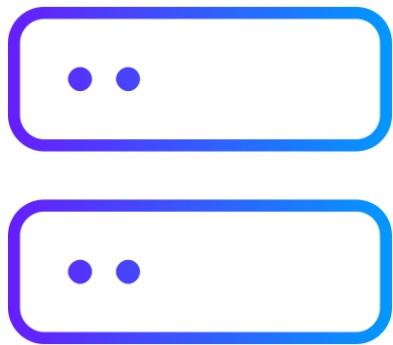
## The GNU Operating System & Free Movement Software

GNU is a recursive acronym for "GNU's Not Unix!", to represent that GNU's design is Unix-like, but differs from Unix: being free software, containing no Unix code.

GNU is an on-going project by the Free Software Foundation (FSF) for the purpose of creating a complete, high performance and freely distributable Unix-like computing environment, begun by Richard Stallman - a leading advocate for free software, in the

latter part of 1983.

Most open source software is released under the GPL. This license was carefully designed by Stallman and the FSF to provide maximum freedom for users of software (including the freedom to copy, study, modify, give away and even sell it) and to prevent software that is initially free from being taken over by any private company that might restrict this freedom.



96.4%  
of  
TOP 1MIL.  
web servers' operating systems

## One Operating System, Many Variants

Linux has become one of the most widely used operating systems in the world.

While the desktop OS market is dominated by Microsoft Windows, the internet server space operates primarily on Linux. Over 96.4% of the top 1 million web servers' operating systems are Linux.

When looking at Linux there are a bewildering number of variants from generalised OS to very specialised single use OS embedded into devices. In the Linux internet server space, there tends to be a limited number of variants in use.

These include RedHat Enterprise distributions, such as RedHat, Oracle, CentOS, Alma and Rocky, or Debian variants known as Debian and Ubuntu.

# 300+ variants

There are several hundred distributions, however only a few dozen account for the great majority of Linux usage.

There are so many options available because unlike Windows and MacOS, Linux is not a one-size-fits-all operating system.

Linux provides a base to customise for your purpose and taste - to make it as productive as possible.

Developers describe Debian as 'the universal operating system' while Red Hat Enterprise Linux (RHEL) is listed as a 'secure operating system and platform for enterprise hybrid clouds'. Ubuntu is referred to as a "modern enterprise open source".

No Linux distribution is the same, due to flexibility and customisation available and as such, each distribution must be compared in a case-by-case scenario.

WellData has established a comparison tool as a foundation for your exploration using the three most popular distributions. The remaining variants are often based on those within the comparison.



If you require a proposal tailored to your database requirements, get in touch with WellData:

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# Basis Of Comparison

	<b>RHEL</b>	<b>Debian</b>	<b>Ubuntu</b>
<b>Software Licence</b>	Open Source	Free	Free
<b>Design &amp; Development</b>	Red Hat Inc.	Debian Project	Canonical Ltd.
<b>OS Family</b>	Linux	Unix-like	Linux
<b>Initial Release</b>	February, 2002	September, 1993	October, 2004
<b>Architecture</b>	AMD64, Power Architecture, S/390, z/Architecture	AMD64, is64, i386, ARM64, ARMel, ARMhf, MIPSel, ppc64, z/Architecture, RISC-V	AMD64, ARM64, i386 ARMhf, ppc64, z/Architecture
<b>Kernel</b>	Monolithic (Linux)	Monolithic (Linux, kFreeBSD, micro, GNU hurd)	Monolithic (Linux)
<b>Distribution</b>	Commercial	Non-Commercial	Commercial
<b>Package</b>	rpm packages + RPM package manager	deb packages + dpkg package manager	deb packages + dpkg package manager
<b>Resolver</b>	yum	apt	Apt
<b>Mission</b>	Corporate entity (profit from package sales)	Software in the Public interest (non-profit)	Corporate entity (profit from package sales)

## Software Licence

Debian and Ubuntu are listed as free while RHEL is open source.



Debian's founding principles is that software should be open source, inclusive of firmware on computer peripherals. It's become common practice to upload device firmware from the device driver. It is (almost always) a pre-compiled binary and as such, classed as 'non-free'. It is, therefore, not included with Debian in its purest form, although it does offer a non-free repository for those who wish to use it. Ubuntu includes non-free as a matter of course.

## Operating System & Kernel



Debian is positioned as a 'Unix-like' operating system rather than Linux due to the availability of its alternative Kernels and not just Linux Kernel. Debian is not just a Linux distribution and has kernels based on numerous Unix-like kernels. RedHat and Ubuntu on the other hand are only available with a Linux kernel.

## Initial Release



Debian is one of the oldest distributions to offer a Linux kernel still in existence and has undoubtedly helped shape Linux as we know it today. This doesn't detract from RedHat - a huge advocate of open source with primary software open sourced stacks. Ubuntu - on the other hand - is the youngest of the big three distributions.



## Architecture

For most users, the differences between the distributions have little impact as they will predominantly be operating on x86\_64 (AMD64) hardware.



## Distribution

RHEL is a paid product with a support licence included, which covers bug fixes, but not direct software support. Other enterprise Linux distributions - such as CentOS - are free but do not include any support beyond community forums. Debian is supported by a non-profit organisation and as such, is supplied on a totally free basis with all support provided by volunteers online.

Ubuntu is offered freely to download and install with optional paid support. Oracle EL operates in a similar manner.



## Packages

The listed distributions fall into two categories - RPM and DEB. There are no true pros or con's to either format. Both formats are nothing more than archive files with attached metadata. In fact, tools exist to convert between the two formats.



## Resolver

The tool chains for managing software installation and resolving package dependencies differ significantly. Ubuntu and Debian utilise the dpkg and apt toolchains. RedHat utilises the rpm and yum toolchains. Neither of the toolchains provide unique functionality that is utilised during normal system administration and so it is not possible to state one toolchain is better than the other.



## Mission & Values

Unsurprisingly, the commercial Linux distributions - Ubuntu and RedHat - are profiting organisations. Debian was founded by Debian Project -a group of volunteers and as a result, do not profit as an organisation. Whilst this distinction exists, it has little impact on the distributions supplied.

## Advantages

- Truly free, in monetary and usage terms.
- It is legal (and encouraged!) for Linux to be installed across devices with no payment required.
- Linux's legendary stability is highly resistant to viruses and it is rare to crash to require a reboot.
- There is low potential of attack vectors for viruses and malicious software or third parties.

## Disadvantages

- Due to the sheer amount of distributions, it is difficult for proprietary software applications to support Linux.

Q: How can something that is free be better than something that is produced and sold by a business for profit?

A: Perhaps it is best to illustrate the answer to this question, with an example. Most people who are exposed to the Internet think that it is truly amazing and extremely useful. Yes, there are extremely successful commercial companies and organisations that use and help shape the internet, but the Internet is actually completely free. No company invented it, no company produces it and no company sells it.

It has been developed mostly by volunteers, by people who take great pride in creating and developing concepts and in enabling everybody to benefit from them.





The use of Linux has been *rapidly growing* on desktop PCs *soaring* in businesses, government agencies, educational institutions *worldwide* Internet web server usage set to *climb*

The use of Linux on Desktop PCs has been growing rapidly. Use has been soaring by businesses, government agencies, educational institutions and individuals worldwide. However, the available statistics on Linux likely underestimate its usage because they are based largely on the number of downloads and disk sets sold. They tend to undercount the situations in which Linux is installed on multiple computers from a single set of CDRoms, such as within a business or by friends sharing disks.

Linux Server usage, especially in the internet server space, outstrips other OSs. Over half the servers in use to serve web content are using Linux compared to only around a third using Windows. With changes to web development practices such as CI/CD utilising Docker, Jenkins and automation tools such as Ansible and Kubernetes the usage of Linux in the internet web server space is only set to climb.



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