# Open Source Development Labs

## Desktop Linux

## Capabilities

version 1.0

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# Contents

# Market Perspective

Linux has the ability to be technically superior to any operating systems (OSs) available. However, operating systems are here simply to support applications. Without support for a critical mass of applications, Linux or any OS will not have wide adoption in the industry.

# Developing Independently

An important decision taken by the OSDL Desktop Linux Working Group is that the Linux operating system will be developed independently. We will not attempt to emulate other existing desktop systems. We feel that the system should interoperate with existing systems, but we do not strive for complete compatibility. The text of the DTL approved statement is as follows:

The DTL Working Group strategy is to produce a desktop system specification that stands on its own merits and exploits its own strengths. Desktop Linux is not intended to replicate existing desktop systems, neither at the level of integration with existing deployments, nor as a development/application environment.

The aim is to produce a specification for a desktop system that has a necessary level of co-existence and interoperability with existing deployments. However, this functionality is not a primary driving force behind development of the system architecture, since intense focus on interoperability is viewed as a potential constraint on Linux Desktop System innovation. We recognize that maintaining a very high level of interoperability and integration would be a never-ending task.

# Hardware Platform Independence

The original intent of the OSDL Desktop Linux Group was to analyze desktop needs independently from the hardware environment. However, when hardware-dependent issues arose in initial discussions, we addressed a single hardware platform in order to bind the problem set. We chose the x86 environment platform because mainline Linux® development is done in this environment—thus this choice simplified our tasks.

If there continues to be a need to address hardware-dependent issues in future Desktop Linux analysis, the scope of this document will be amended to include other hardware platforms in architectural-specific sections. To this end, we welcome participation of companies and individuals who wish to extend this document to address additional architectures.

# Identifying Major Roadblocks

A major focus for the OSDL Desktop Linux Group is to identify major roadblocks that affect widespread Linux OS adoption in the enterprise. Enterprise Linux adoption is directly tied to the number of independent software vendor (ISV) applications available in the Linux environment.

Variety and choice, two of Linux's greatest strengths, are also its Achilles heel. ISVs and large corporations do not have the resources (or ability, in some cases) to ensure all applications work in all current graphical environments and windowing managers available in each distribution.

As a part of any enterprise, Linux will be one of a number of operating systems available. Interoperability is a key factor in the corporate adoption of Linux. Many of the ISVs have already ported their applications to different flavors of UNIX, and they don't want to do it again. Any similarities across the different operating systems, such as the same graphics environment, will be welcomed and encouraged by the ISVs.

Users and developers realize the business need for a single graphical environment across all Linux distributions. This is a business need, not a technical one. The overall intent is to have a Linux environment that ISVs can depend upon as being available and consistent across all distributions. The DTL statement adopted on this subject is as follows:

The declared aim of the Desktop Linux Working Group is to accelerate adoption of Desktop Linux in the enterprise. After considerable debate and review, members of the group have reached the conclusion that specifically in the desktop context, the most significant problem inhibiting global acceptance of desktop Linux is the lack of desktop area and interface standards.

ISVs and enterprise users require a clear, consistent set of interfaces, and they can afford to port to and support only one set of interfaces. On Linux, these interfaces are presented by the Desktop environment. It became clear that, moving forward, Desktop Linux needs a single desktop with a consistent, backward-compatible interface. This single set of programmatic, administrative and usage interfaces is essential to accelerate acceptance of Linux on the desktop.

Viable options for producing a single Desktop Linux interface include the following:

- Merge the current Linux desktop leaders into a single environment.
- Create an abstraction layer to mask differences.
- Select an existing desktop.

Only the last option was determined feasible in the short to medium term.

# Context and Scope

In this document, the OSDL Desktop Linux team outlines their initial thoughts regarding capabilities required for implementation of the Linux operating system on the desktop.

The scope of the document is to identify Desktop Linux capabilities that are required for particular enterprise user segments, and to determine technical and marketing needs for each segment. The segments considered are as follows:

- Basic Office
- Transaction Worker
- Technical Workstation
- Fixed Function

We have focused our analysis on the core capabilities that drive these four user segments, particularly on the OS platform, browser infrastructure and network.

OSDL recognizes that at least a fifth user segment, "General Purpose," exists. However, our work effort is not focused on additional segments, thus they are not addressed here.

Desktop Linux capabilities are grouped according to the following application layers:

- Hardware Support
- Operating System Services
- Application Services
- System Security
- Browser
- Installer
- Accessibility
- Basic Network Services

OSDL does not attempt to specify whether specific technologies are "correct" or "incorrect" solutions for Desktop Linux. In addition, OSDL deliberately does not focus deeply on any one area, and we do not dive into great depth about formal requirements.

# Conventions in This Document

The following sections describe two things.

- The five user segments considered for Desktop Linux capabilities
- The table format used to describe each Desktop Linux capability

# User Segments

The OSDL Desktop Linux (DTL) Marketing Group has identified five user segments that require Desktop Linux capabilities.

All five segments are described here, but the group is currently focusing on the first four.

This table illustrates the work-style requirements of the five segments.

| Fixed Function | Technical Workstation | Transactional Workstation | Basic Office | General Purpose |
|---|---|---|---|---|
| Limited use of business applications | Applications that drive business properties | | | |
| No office productivity | Simple office productivity | | | Advanced office productivity |
| No email | Advanced email | Simple email (webmail) | | Advanced email |
| No instant messaging | Instant messaging | | | |
| Simple browser access to intranet portals | Advanced browser access to the Internet | Simple browser access to intranet portals | Advanced browser access to the Internet | |
| File, print, systems management, network access and host emulation | | | | |

# Fixed Function

Users using fixed function machines run a single designated application that is customized for specific usage. These machines do not have a desktop: When the system boots, the application is invoked and its first screen is presented.

These users interact with the application through presented screens and panels. By definition, these machines do not run productivity applications. The users have no knowledge of the underlying operating system running the machine, no way of determining what operating system is running and no way of accessing the operating system.

A few examples of fixed function machines include point of sale terminals, airline boarding pass kiosks and ATM machines.

The ability to deliver Linux Desktop solutions to this enterprise user segment is restricted by the availability of the segment's required applications on Linux.

# Technical Workstation

These users run engineering or specialized industry-specific desktop applications such as computer animation. Their choices of hardware and operating systems are secondary to their choices of applications.

These users collaborate through basic email and instant messaging, and they browse intranet and internet sites. Technical desktops are prevalent in the UNIX marketplace.

This segment includes movie animation studios and engineers using CAD/CAM. Often these applications are built in C/C++, and they are highly dependent on the Windows user interface, the Windows desktop or the Solaris operating system.

The ability to deliver Linux Desktop solutions to this enterprise user segment is restricted by the availability of the segment's required applications on Linux.

# Transactional Worker

Users using these desktop machines typically run multiple customized business applications, most of which are structured or forms-based. They also browse the Web and collaborate through basic email.

Their web browsing is generally limited to information gathering (for example, obtaining corporate information and determining flight schedules). Email usage is limited to within the company, and generally the users do not have operating system expertise. These users may use simple server-based office productivity applications that may be remote or available via HTML.

Typically, users using these desktops include travel agents, bank administration personnel and front office personnel.

The ability to deliver Linux Desktop solutions to this enterprise user segment is restricted by the availability of the segment's required applications on Linux.

# Basic Office

Employees in the business world use desktop computers to drive company processes and productivity using word processing, presentation and spreadsheet applications, to name a few. These users use the applications to create and view simple documents such as memos, letters, presentations and spreadsheets.

Generally these users require only basic compatibility (including basic import and export compatibility) with other document formats, such as Microsoft Office. These are not 'power' office users, so they do not require complex functions such as scripting. They require basic browser functionality to access information such as corporate guidelines, parts information and loan information. They use email to communicate information and to send documents through attachments.

These users include loan officers and insurance agents who work in connected environments.

The ability to deliver Linux Desktop solutions to this enterprise user segment is dependent upon the availability of basic business applications on Linux.

## General Purpose

General-purpose users use desktop computers to drive company processes. They use arbitrary Windows applications that are dependent on Windows application program interfaces (APIs) such as MFC, IE and WIN APIs. They are highly skilled in the Windows user interface, and they depend on being able to interact with the Windows operating system and Windows-based applications to do their jobs.

Users of general-purpose desktops employ applications to create and modify complex documents for use within and outside of their companies. They are dependent on Microsoft Office data format, and their skills center on Microsoft Office user interface, functionality and feature sets. Often people in this enterprise user segment *don't want to move away from Windows.*

# Table Format for the Desktop Linux Capabilities

| Capability Name | | | |
|---|---|---|---|
| Each table describes a unique Desktop Linux capability. The capability name is a short description of the capability, and the name is used in all internal and external communication. | | | |

| ID Number | Significance for User Segments | | |
|---|---|---|---|
| Each capability is assigned an identifier in the format of XX-number. | 1. Desktop Linux readiness is mandatory for this enterprise user segment. | | |
| The XX abbreviation indicates the market capability layer, as defined here:<br>HW: Hardware | 2. Desktop Linux readiness is optional for this enterprise user segment.<br>3. Desktop Linux readiness is not required for this enterprise user segment. | | |
| OS: Operating System Services | | | |
| AP: Application | **Fixed Function**<br>1, 2 or 3 | **Transactional Worker**<br>1, 2 or 3 | **Basic Office**<br>1, 2 or 3 | **Technical Workstation**<br>1, 2 or 3 |
| SS: System Security | | | |
| NS: Network Services | | | |
| BR: Browser | | | |
| IN: Installer | | | |
| AC: Accessibility | | | |

| Rationale |
|---|
| This section explains the reasoning behind the DTL Marketing team's decision to include this topic as a Desktop Linux capability. |

| Description |
|---|
| This section describes the DTL Marketing team's goal and scope for the market capability. |

| References |
|---|
| These often include links to website pages that address specific topics related to the capability. |

# Desktop Linux Capabilities

Each Desktop Linux capability is described in a table, and tables are grouped and numbered within layers.

## Hardware Support

This section describes the underlying hardware technology required to support the desktop. It is not intended to address detailed requirements that match specific hardware configurations.

| CPU Requirements—32-Bit | | | |
|---|---|---|---|
| HW-1. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| The minimum CPU requirements vary drastically, based upon the user segment. | | | |
| Description | | | |
| Linux should meet the minimum requirements to run on a 32-bit CPU/System with >1GHz/128MB. | | | |
| References | | | |
| | | | |

| CPU Requirements—64-Bit | | | |
|---|---|---|---|
| HW-2. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 3 | 3 | 3 | 2 |
| Rationale | | | |
| The 64-bit architecture is an emerging technology that is important to support enterprise-level applications. | | | |
| Description | | | |
| Linux should meet the minimum requirements to run on a 64-bit CPU with 512Mb of memory. | | | |
| References | | | |
| | | | |

| Video/Graphics Cards Support—AGP/PCI | | | |
|---|---|---|---|
| **HW-3.** | **Significance for User Segments** | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| **Rationale**<br>AGP and PCI are the prevalent hardware architecture standards for graphics support. | | | |
| **Description**<br>Linux should support Accelerated Graphics Port (AGP) 8x and Peripheral Component Interconnect (PCI). | | | |
| **References**<br>"What is AGP?": http://www.sysopt.com/agp.html<br><br>PCI definition on Webopedia: http://www.webopedia.com/TERM/P/PCI.html | | | |

| Video/Graphics Cards Support—PCIe | | | |
|---|---|---|---|
| **HW-4.** | **Significance for User Segments** | | |
| | Fixed Function<br>3 | Transactional Worker<br>3 | Basic Office<br>3 | Technical Workstation<br>2 |
| **Rationale**<br>PCIe is the emerging hardware architecture standard for graphics support. | | | |
| **Description**<br>Linux should support graphic cards on PCIe technology. | | | |
| **References** | | | |

| Integrated Graphics Support on System Board | | | |
|---|---|---|---|
| HW-5. | Significance for User Segments | | |
| | Fixed Function  1 | Transactional Worker  1 | Basic Office  1 | Technical Workstation  1 |
| Rationale | | | |
| This is a pervasive configuration to support graphics, especially for low-end configurations. | | | |
| Description | | | |
| Linux Kernel 2.6 should meet the minimum OS requirement for integrated graphics support. | | | |
| References | | | |

| Display Support | | | |
|---|---|---|---|
| HW-6. | Significance for User Segments | | |
| | Fixed Function  1 | Transactional Worker  1 | Basic Office  1 | Technical Workstation  1 |
| Rationale | | | |
| Description | | | |
| Linux should support displays that meet the broad needs of the four defined user segments. Display detection is a critical need for OS support. Linux should provide a minimum level of support for the currently-prevalent display, for example, video graphics array (VGA). Linux should support emerging technologies, for example, high definition (HD), flat panel, multiple display support and projector support. | | | |
| References | | | |

| Peripherals Support | | | |
| --- | --- | --- | --- |
| HW-7. | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>Linux should support the most common input devices that cover the majority of the market. | | | |
| Description<br>Linux should support Universal Serial Bus (USB) and PS/2 mice, USB or PS/2 keyboards, USB flash/memory stick and USB boot. | | | |
| References | | | |

| USB 2.0 Support | | | |
| --- | --- | --- | --- |
| HW-8. | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>USB has become ubiquitous, and it needs to be supported. | | | |
| Description<br>Linux should support USB 2.0 for all currently selling platforms. The USB 2.0 specification is backward compatible to USB 1.1 | | | |
| References<br>http://www.usb.org/developers/estoreinfo/ | | | |

## IEEE 1394 (400/800) Support

| HW-9. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function<br><br>2 | Transactional Worker<br><br>2 | Basic Office<br><br>2 | Technical Workstation<br><br>2 |

**Rationale**

Because we see storage devices attached with IEEE 1394 support, it is important to support this technology.

**Description**

Linux should support the IEEE 1394 (400/800) high-speed serial data bus standard, for example, Firewire implementation.

**References**

IEEE 1394 definition on Webopedia: http://www.webopedia.com/TERM/I/IEEE_1394.html

## Bluetooth Support

| HW-10. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function<br><br>2 | Transactional Worker<br><br>3 | Basic Office<br><br>3 | Technical Workstation<br><br>2 |

**Rationale**

It is important to support personal network attachment, for example, personal digital assistant (PDA) devices.

**Description**

Linux should support Bluetooth short-range radio technology. This includes support for the most important profiles that assist the four user segments outlined in this document.

**References**

Motorola Bluetooth wireless technology:
http://www.motorola.com/mdirect/demos/bluetooth03/index.html

| Serial Device Support | | | | |
|---|---|---|---|---|
| HW-11. | Significance for User Segments | | | |
| | Fixed Function 1 | Transactional Worker 1 | Basic Office 1 | Technical Workstation 1 |
| Rationale | | | | |
| Desktop configurations include legacy devices that require serial support. | | | | |
| Description | | | | |
| Linux should continue to support serial devices via RS-232 ports. | | | | |
| References | | | | |
| An RS232 Standard tutorial: http://www.camiresearch.com/Data_Com_Basics/RS232_standard.html | | | | |

| Power Management—Desktops | | | | |
|---|---|---|---|---|
| HW-12. | Significance for User Segments | | | |
| | Fixed Function 2 | Transactional Worker 1 | Basic Office 1 | Technical Workstation 1 |
| Rationale | | | | |
| In order to be ENERGY STAR® compliant, devices must have power management capability. To prevent information from being lost, a device should flush current buffers before it goes into sleep mode. Hard drives should capture all cache data so it isn't lost, and graphics should be restored correctly. | | | | |
| Description | | | | |
| Linux should have communication hooks throughout the system. When the system goes into low power mode, all devices should prepare for and respond to it. Linux should support S3/S4, and for platforms that use the Advanced Configuration and Power Interface (ACPI), Linux should support the ACPI 2.0 specification. | | | | |
| References | | | | |
| ENERGY STAR home: http://www.energystar.gov/index.cfm?c=power_mgt.pr_power_management The ACPI specification: http://www.acpi.info/ | | | | |

## Power Management—Laptops

| HW-13. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 3 | 1 | 1 | 1 |

**Rationale**

To prevent information from being lost, a device flushes current buffers before it goes into sleep mode. Hard drives capture all cache data so it isn't lost, and graphics are restored correctly.

In addition, in order to be ENERGY STAR® compliant, devices must have power management capability.

For laptop configurations, efficient power usage is a requirement for extended battery life.

**Description**

Linux should have communication hooks throughout a system. If the system goes into low power mode, all devices should prepare for and respond to it.

Linux should support S3/S4, and for platforms that use the Advanced Configuration and Power Interface (ACPI), Linux should support the ACPI 2.0 specification.

**References**

The ACPI specification: http://www.acpi.info/

## Network Support/LAN

| HW-14. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

Network support is a vital aspect of the Desktop Linux effort.

**Description**

Linux should support common-network interfaces (wired and wireless) that have Linux kernel drivers available, and Linux should support integrated local-area network (LAN).

**References**

| Audio-Basic Support | | | |
|---|---|---|---|
| HW-15. | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>AC97 is commonly included as onboard audio support. | | | |
| Description<br>Linux should support AC97 basic audio. | | | |
| References<br>Intel Audio Codec: http://www.intel.com/technology/computing/audio/index.htm | | | |

| AC97 Full Support | | | |
|---|---|---|---|
| HW-16. | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>1 |
| Rationale<br>Additional features, such as support for win modem, may be required. Technical workstations require expanded tactical feedback to the user. | | | |
| Description<br>Linux should completely support AC97. | | | |
| References<br>Intel Audio Codec: http://www.intel.com/technology/computing/audio/index.htm | | | |

| CD and DVD Support | | | |
|---|---|---|---|
| HW-17. | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>CD and DVD devices support a variety of enterprise needs, for example, local backup, software distribution and so on. | | | |
| Description<br>Linux should support data-only DVDs, which retrieve data off of the device. Linux should support rewritable CDs (CD-RW) and DVDs (DVD-RW). | | | |
| References | | | |

| CD and DVD Multimedia Device Support | | | |
|---|---|---|---|
| HW-18. | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |
| Rationale<br>Graphic applications and training commonly require CD and DVD devices. | | | |
| Description<br>Linux should support multimedia CD and DVD devices.<br>Linux should fully support audio/video devices, which will require licenses. | | | |
| References | | | |

| Disk Drive and Interface Standard Support–-SATA/IDE, SCSI | | | |
|---|---|---|---|
| HW-19. | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |

| Rationale |
|---|
| This is required to support mainstream and legacy hardware. |

| Description |
|---|
| Linux should support the following disk drives and interface standards: Serial Advanced Technology Attachment (SATA), Intelligent Drive Electronics (IDE) and small computer system interface (SCSI). |

| References |
|---|
| Serial ATA Organization, "SATA-IO: Enabling the Future": :http://www.serialata.org/ |
| PCMechanic, "IDE Interface": http://www.pcmech.com/show/harddrive/78/ |
| STA SCSI Trade Association: http://www.scsita.org/ |

| PCMCIA Disk Controller Support—Desktop | | | |
|---|---|---|---|
| HW-20. | Significance for User Segments | | |
| | Fixed Function<br>3 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |

| Rationale |
|---|
| PCMCIA hardware is still in use on desktop systems (for example, Crypto keys), and it must be supported. |

| Description |
|---|
| Linux should support Personal Computer Memory Card International Association (PCMCIA) and CardBus disk cards. |

| References |
|---|
| PCMCIA, Card Bus Information: http://www.pcmcia.org/cardbus.htm |

| PCMCIA Disk Controller Support—Laptop | | | |
|---|---|---|---|
| HW-21. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 3 | 1 | 1 | 1 |
| Rationale<br>Personal Computer Memory Card International Association (PCMCIA) is widely used to support hardware devices attached to laptop computers. | | | |
| Description<br>Linux should support (PCMCIA) and CardBus disk cards. | | | |
| References<br>PCMCIA Organization: http://www.pcmcia.org/ | | | |

| USB Disk Controller Support | | | |
|---|---|---|---|
| HW-22. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 2 | 2 | 2 | 2 |
| Rationale<br>USB disk devices are prevalent and must be supported. | | | |
| Description<br>Linux should support universal serial bus (USB) disk cards. | | | |
| References | | | |

| Printer Support | | | |
|---|---|---|---|
| HW-23. | Significance for User Segments | | |
| | Fixed Function 2 | Transactional Worker 2 | Basic Office 2 | Technical Workstation 3 |
| Rationale | | | |
| Linux needs to support the pervasive enterprise formats. ASCII is still in use in some areas. | | | |
| Description | | | |
| Linux should support the most commonly used formats, for example: ASCII, PostScript and printer control language (PCL) | | | |
| Computers using Linux operating systems should be able to connect to printers through USB, integrated or USB Bluetooth, network or parallel ports. | | | |
| References | | | |
| | | | |

| TV Tuner (Decoder) Support | | | |
|---|---|---|---|
| HW-24. | Significance for User Segments | | |
| | Fixed Function 2 | Transactional Worker 3 | Basic Office 3 | Technical Workstation 3 |
| Rationale | | | |
| Some fixed-function uses involve TV display. | | | |
| Description | | | |
| Linux should support TV decoding / tuning by using X11 and following Consumer Electronics Linux Forum (CELF) specifications. | | | |
| References | | | |
| CE Linux Forum: http://www.celinuxforum.org/ | | | |

# Operating System Services

In this context, an operating system is defined as the kernel, support applications and utilities. This section covers basic functionality that the OS needs to provide.

| Remote Boot Capability | | | |
| --- | --- | --- | --- |
| OS-1. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| In order to adequately support desktop configurations, Information Technology support teams need to have the capability to boot a desktop remotely. | | | |
| Description | | | |
| Linux should have remote boot capability. Linux should boot with no user intervention required. | | | |
| References | | | |

| Network Management Support | | | |
| --- | --- | --- | --- |
| OS-2. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 2 | 2 | 2 | 2 |
| Rationale | | | |
| SNMP is a commonly used protocol that should be supported. | | | |
| Description | | | |
| Linux should support simple network management protocol (SNMP) or similar capabilities for devices that use those protocols. Linux should not pose inhibitors to the use of these network management functions. | | | |
| References | | | |

| File System Support—Non-Native/Local | | | |
|---|---|---|---|
| **OS-3.** | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>Interoperability is a key goal for the enterprise. | | | |
| Description<br>Linux should minimally support FAT, FAT32 and NTFS file systems. Linux should provide read-only support for NTFS (current drivers only support r/o capability). | | | |
| References | | | |

| File System Support–-Remote Protocols | | | |
|---|---|---|---|
| **OS-4.** | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>File storage and sharing requires remote file storage. | | | |
| Description<br>Linux should support remote network file system protocols (NFS) and server message block file serving (SMB/CIFS). | | | |
| References | | | |

| LSB 2.0 Support | | | |
|---|---|---|---|
| OS-5. | Significance for User Segments | | |
| | Fixed Function 1 | Transactional Worker 1 | Basic Office 1 | Technical Workstation 1 |

| Rationale |
|---|
| LSB standards are an important and pervasive set of standards. |
| Description |
| All components of the Linux operating system should be LSB 2.0-compliant. |
| References |

| Abstraction Layer for Audio/Video Devices | | | |
|---|---|---|---|
| OS-6. | Significance for User Segments | | |
| | Fixed Function 2 | Transactional Worker 2 | Basic Office 2 | Technical Workstation 2 |

| Rationale |
|---|
| A common API is needed for Audio/Video support. |
| Description |
| Linux should include an abstraction layer for audio and video devices. |
| References |

| Hot Pluggable Device Support | | | |
|---|---|---|---|
| **OS-7.** | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |

**Rationale**

On desktops, the need exists to insert and remove devices, including the capability to do so while the operating system is running.

**Description**

Linux should support automatic installation of device drivers, auto-configuration of devices, auto-mounting and more.

**References**

Linux hotplugging: http://linux-hotplug.sourceforge.net/

OSDL hotplug SIG: http://developer.osdl.org/maryedie/HOTPLUG

| Persistent Device Naming | | | |
|---|---|---|---|
| **OS-8.** | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |

**Rationale**

File system naming and applications are associated with the contents of a storage device, not an I/O address. On enterprise systems, many RAS options like Multipath, Clusters and Volume Management can cause physical device addresses to change. Therefore there needs to be a dynamic and consistent association between device naming and storage contents.

**Description**

Linux should provide persistent device naming.

**References**

u/dev: http://www.kernel.org/pub/linux/utils/kernel/hotplug/udev.html

| Driver Installation Standard | | | | |
| --- | --- | --- | --- | --- |
| OS-9. | Significance for User Segments | | | |
| | Fixed Function 1 | Transactional Worker 1 | Basic Office 1 | Technical Workstation 1 |

**Rationale**

HP OfficeJet (HPOJ) and most scanner drivers are user-space drivers, and HPOJ and USB scanner drivers use libsub. In Linux 2.6, kernel input subsystem events are passed to user space via /dev/input/eventX.

**Description**

Linux should provide a common driver installation method for user space drivers. Linux should include a mechanism to define which drivers a user can install.

**References**

Libusb library project: http://libusb.sourceforge.net/,

HP OfficeJet Linux driver: http://hpoj.sourceforge.net/

Linux USB HID: http://www.frogmouth.net/hid-doco/linux-hid.html

# Application Services

This section describes the support services for Applications.

In future releases, we will expand the scope of our analysis to describe specific application requirements such as the items identified in the User Segments diagram.

| Receive Streaming Media | | | |
|---|---|---|---|
| AP-1. | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |
| Rationale | | | |
| Enterprise-class deployments need this capability to disseminate information internally and externally. | | | |
| Description | | | |
| Linux should have the capability to receive streaming media of video, audio, e-learning and video on demand. Commercial codecs and protocols are not yet supported on Linux. | | | |
| References | | | |

| Send Streaming Media | | | |
|---|---|---|---|
| AP-2. | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>2 | Basic Office<br>3 | Technical Workstation<br>2 |
| Rationale | | | |
| Enterprise-class deployments need this capability to disseminate information internally and externally. | | | |
| Description | | | |
| Linux should have the capability to send audio and video streams. | | | |
| References | | | |

| MPEG Encoding | | | |
|---|---|---|---|

| AP-3. | Significance for User Segments | | |
|---|---|---|---|
| | Fixed Function<br>2 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |

**Rationale**

MPEG encoding is only needed to create content.

**Description**

Linux should support software encoding of MPEG4 and MPEG2 digital video compression streams. Linux should provide mandatory licensed content protection.

**References**

 

| Windowing System Independence | | | |
|---|---|---|---|

| AP-4. | Significance for User Segments | | |
|---|---|---|---|
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |

**Rationale**

For basic users, switching between different widget sets can be quite confusing. For advanced users, it is less confusing but still annoying. In either case, switching presents a disconnect from the expected.

By presenting the user's preferred windowing system and widget set, Linux could emphasize clean integration, compatibility and a desirable level of professionalism. Since installation is the first exposure the user has to Linux, a clean, unsurprising experience would enable the user to enter his or her first use of the operating system with a positive attitude.

**Description**

The Linux installer's graphical user interface (GUI) should present the user's preferred windowing system and widget set. This should be determined automatically, based on environment settings. If this is not possible, the user should be prompted or a suitable default should be used.

If the user is not running a windowing system or wishes to run it in a non-graphical manner, the installer should fall back to a command line-based installation mechanism.

**References**

 

## File Format Support—Media

| AP-5. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

Multi-media content is pervasive on desktops. Common audio, video and image formats should be supported by any system that is widely deployed as a desktop.

**Description**

Linux should support audio formats, video formats and graphic/image formats. This capability includes rendering application support for these file formats.

- Multi-media Formats: Flash and Shockwave
- Audio Formats
- Video Formats: for example MPEG4 (Decode)
- Graphics/image formats: JPEG, PNG, GIF, TIFF
- Text formats: .PDF, .RTF

**References**


## Multimedia Receiving Architecture

| AP-6. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 2 | 2 | 2 | 2 |

**Rationale**


**Description**

- Baseline set of compressors/decompressors (codecs)
- Pluggable codec architecture (also happens at application level)
- Dynamically loadable codec architecture
- Self-identifying media formats

**References**

Current applications are MPlayer, Xine and Videoland (each has pluggable codec architecture):

DVD movies today include codec embedded-players for Windows. There are regional codecs.

# System Security

This section covers key categories for system security.

| Access Control Services | | | |
| --- | --- | --- | --- |
| SS-1. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

**Description**

The Linux system should authenticate users by comparing user-provided credentials to credentials existent in the user database. Authentication is the act of ascertaining a user's identity; however, positive authentication alone is not sufficient to grant access to protected resources. The following list illustrates different methods of authentication:

- Local authentication: Identity of the user is verified against a local database.
- Directory-based authentication: Identity of the user is verified against a remote user database/directory service.
- Secret Key Authentication (Kerberos): Kerberos is a widely used authentication protocol that facilitates secure platform-neutral authentication to a central user database.
- Public Key Authentication (PKI certificates): Typically used in the form of hardware tokens with the user certificate embedded on the chip, verified against the record maintained by the Certificate Authority (CA).
- Authenticated access to network file systems
- Authorization

Authenticated users may be selectively authorized to access specific information. The act of authorization grants a user the level and type of access appropriate for that user. In this context, authorization is closely related to Role Based Access Control (RBAC), which is often implemented as a separate subsystem within the security layer. In these scenarios, the followings methods can be used:

- Local authorization: Access to a locally hosted authorization database
- Directory-based authorization: Access to a remotely hosted authorization database

Applications and system services that require support for authentication and authorization should use Pluggable Authentication Module (PAM) interface to authenticate and authorize access to protected resources. This approach modularizes access control within the system, and it allows applications and system services to rely on common modules that provide the needed services. This approach also eliminates the need for the applications and services to implement this functionality separately.

**References**

Rule Set Based Access Control: http://www.rsbac.org

| Data Protection Services | | | |
|---|---|---|---|
| SS-2. | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |

| Rationale |
|---|
| |

| Description |
|---|
| These data protection services are commonly used:<br><br>• File system-based data encryption: It may be necessary to protect sensitive data by encrypting it. The most simple and common form of data encryption is file-based encryption.<br><br>• Passphrase-based encryption: A password or passphrase is used to encrypt and decrypt the data<br><br>• X.509 certificate-based encryption: A PKI certificate is used to encrypt and decrypt the data<br><br>• Network-based data encryption: The need for network-based data encryption commonly arises in situations where the data being sent across the network is sensitive enough to warrant additional protection from eavesdropping.<br><br>• Protocol-based security: Protocols such as Kerberos, HTTPS and others already include measures to combat unauthorized disclosure of information being transmitted across the network.<br><br>• Protocol-independent security: For protocols that do not include built-in security (HTTP, SMTP and so on), Virtual Private Networks (VPN) and/or secure IP (IPSec) technology can be used to secure links.<br><br>• Firewall: A software firewall is usually the first line of defense against malicious agents on external networks wanting to gain access to local resources.<br><br>The data protection services listed above fundamentally rely on ciphers of various lengths and complexities to provide underlying security. The Linux system should provide ciphers appropriate to users' current needs, keeping local crypto export and usage laws in mind.<br><br>Generic Security Service Application Program Interface (GSSAPI) is an abstraction layer used to present higher-level applications with a generic interface to underlying security providers and protocols. Certain protocols such as Kerberos, and to some extent X.509, are presently integrated with GSSAPI. Integration with GSSAPI is an important item on the security roadmap, and it should be a priority in ongoing and future work in the security protocols arena. |

| References |
|---|
| Data Protection Services: http://www.finux.org/Reprints/Reprint-Halcrow-OLS2004.pdf |

| Local Authentication | | | |
|---|---|---|---|
| SS-3. | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>Functionality must be provided to authenticate the user onto a machine that does not have access to network authentication resources. | | | |
| Description<br>Linux should use a local database to authenticate the user. | | | |
| References<br>/etc/passwd  /etc/shadow<br><br>Refer to Linux-PAM:  http://www.kernel.org/pub/linux/libs/pam/ | | | |

| Directory-Based Authentication | | | |
|---|---|---|---|
| SS-4. | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>For a machine that is both connected to the network and has access to a remote user database, functionality should be provided to allow the machine to authenticate the user using the remote authentication service.<br><br>Support for LDAP protocol is required in order to support directory-based authentication. | | | |
| Description<br>Linux should use a remote authentication service (such as a central LDAP database) to authenticate the user. | | | |
| References<br>Microsoft Active Directory, Sun Directory Server, OpenLDAP<br><br>Refer to Linux-PAM:  http://www.kernel.org/pub/linux/libs/pam/ | | | |

| PAM Support | | | |
|---|---|---|---|
| SS-5. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

All modern UNIX operating systems support Pluggable Authentication Modules (PAM), which simplify authentication management and allow for fine grained-control of authentication processes.

**Description**

Linux should provide authentication services in the form of Pluggable Authentication Modules (PAM).

Clear documentation concerning the following areas should be provided:

- PAM API reference
- PAM usage reference
- PAM module reference

**References**

Refer to Linux-PAM: http://www.kernel.org/pub/linux/libs/pam/

| Kerberos Protocol Support | | | |
|---|---|---|---|

| SS-6. | Significance for User Segments | | |
|---|---|---|---|
| | Fixed Function <br> 1 | Transactional Worker <br> 1 | Basic Office <br> 1 | Technical Workstation <br> 1 |

**Rationale**

Kerberos support is required in environments where MIT Kerberos-compliant authentication back-ends are being used. However, the MIT implementation of Kerberos has been determined to be lacking sufficient functionality for enterprise deployment.

Microsoft, however, has addressed these concerns in the Active Directory product (as per RFC1510 and RFC1510bis). The Kerberos implementation shipped as part of the Linux distribution should interoperate with MIT and MS Active Directory back-ends and support enterprise-specific extensions.

**Description**

Linux should support the Kerberos authentication protocol.

**References**

Kerberos, the Network Authentication Protocol: http://web.mit.edu/kerberos/

MS Active Directory, GSSAPI

Refer to Linux-PAM: http://www.kernel.org/pub/linux/libs/pam/

| PKI/X.509 Protocol Support | | | |
|---|---|---|---|

| SS-7. | Significance for User Segments | | |
|---|---|---|---|
| | Fixed Function <br> 1 | Transactional Worker <br> 1 | Basic Office <br> 1 | Technical Workstation <br> 1 |

**Rationale**

PKI authentication is required, either in the form of passphrases or hardware-based PKI tokens, in environments where public key infrastructure has been deployed.

**Description**

Linux should support PKI.

**References**

OpenSSL, OpenLDAP, Signing and Encryption of email, GSSAPI

## Local Authorization

| SS-8. | Significance for User Segments | | | |
|-------|-------|-------|-------|-------|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

Following authentication, functionality must exist to provide the appropriate authorization context to the user on a machine that does not have access to network authorization resources.

**Description**

Linux should provide a local authorization database, which will serve as a source for authorization context on the machine.

**References**

sudo, Solaris RBAC model

Linux-PAM: http://www.kernel.org/pub/linux/libs/pam/

Linux Extended Attributes and ACLs: http://acl.bestbits.at

## Directory-Based Authorization

| SS-9. | Significance for User Segments | | | |
|-------|-------|-------|-------|-------|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

Following authentication, functionality must exist to provide the appropriate authorization context to the user on a machine that has access to a remote authorization service.

**Description**

The Linux machine should be able to authorize the user by using a remote authorization service.

**References**

Microsoft Active Directory/GPO/ACL stores, NIS netgroups

Refer to Linux-PAM: http://www.kernel.org/pub/linux/libs/pam/

| Passphrase-Based File Encryption | | | |
|---|---|---|---|
| SS-10. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| Functionality should be provided to allow users to encrypt and decrypt files by using a password or passphrase. | | | |
| Description | | | |
| Linux users should be able to encrypt and decrypt files by providing a password or a passphrase. | | | |
| References | | | |
| | | | |

| X.509 Certificate-Based File Encryption | | | |
|---|---|---|---|
| SS-11. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| If a machine is part of the PKI infrastructure, functionality should be provided to allow users to encrypt and decrypt files using their X.509 certificates. | | | |
| Description | | | |
| Linux users should be able to encrypt and decrypt files by using their X.509 certificates. | | | |
| References | | | |
| | | | |

| IPSec | | | |
|---|---|---|---|
| SS-12. | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale | | | |
| IPSec is an IP Security layer that provides security to network communications that lack security at the protocol level. | | | |
| Description | | | |
| Linux should support IPSec communications. | | | |
| References | | | |
| FreeS/WAN, OpenS/WAN | | | |

| VPN | | | |
|---|---|---|---|
| SS-13. | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale | | | |
| A machine must be able to act as the client endpoint on a VPN connection. | | | |
| Description | | | |
| Linux should support VPN connectivity based on SSL/TLS and IPSec stack. | | | |
| References | | | |
| HTTPS, OpenSSL, FreeS/WAN, OpenS/WAN | | | |

| Firewall | | | | |
|---|---|---|---|---|
| SS-14. | Significance for User Segments | | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>A software firewall is usually the first line of defense against malicious agents on external networks who are seeking to gain access to local resources. | | | | |
| Description<br>Linux should support software firewalls. | | | | |
| References<br>IPTables | | | | |

| Network Filesystem Access | | | | |
|---|---|---|---|---|
| SS-15. | Significance for User Segments | | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>The ability to access distributed filesystems that require filesystem protocol-based authentication must be supported. | | | | |
| Description<br>Linux should provide functionality to support authenticated access to network filesystems. Such filesystems include NFS and SMB/CIFS.<br><br>In order to support NFS, Linux should support the following protocols:<br><br>• legacy authentication methods intrinsic to NFSv2 and NFSv3<br>• GSSAPI and Kerberos v5 authentication specific to upcoming NFSv4<br><br>The following protocols provide support for authentication in SMB and CIFS-based filesystems (Windows 9x, NT, 2000/XP). Linux should support the following protocols:<br><br>• NTLM v1<br>• NTLM v2<br>• Kerberos v5 | | | | |
| References<br>NFS, CIFS | | | | |

# Network Services

The Network Services are capabilities that define standards that enable Linux systems in enterprise environments. These standards also enable the systems to access network resources within the enterprise environment.

Implementing the features in this section will increase Linux's ability to authenticate with the network, configure system services, access network resources (including files and printers), surf the intra/internet and send and receive email.

| Link State Detection | | | |
|---|---|---|---|
| NS-1. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| Description | | | |
| In order to initiate network connectivity, a Linux system in an enterprise environment should be configured to support the detection of link state on the network medium, either wired or wireless. Note that ifplugd provides support of script execution on link state change. For wireless, this requires the existence of wireless configuration tools, and the wireless driver should be configured sufficiently to associate and create the link. | | | |
| References | | | |

| IPv4 Support | | | |
|---|---|---|---|
| NS-2. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| Linux should support version 4 of Internet Protocol (IP) in order to work in current (IP) networks. | | | |
| Description | | | |
| The Linux client should be configured to support IPv4. | | | |
| References | | | |

| IPv6 Support | | | |
|---|---|---|---|
| NS-3. | Significance for User Segments | | |
| | Fixed Function<br><br>2 | Transactional Worker<br><br>2 | Basic Office<br><br>2 | Technical Workstation<br><br>2 |
| Rationale<br><br>In order to work in current Internet Protocol (IP) networks and networks being deployed using Internet Protocol version 6 (IPv6), Linux should support v4 and v6 versions of IP.<br><br>The Linux kernel and system libraries currently provide support for IPv6. | | | |
| Description<br><br>The Linux client should be configured to support both IPv4 and IPv6. | | | |
| References | | | |

## Automatic Network Configuration

| NS-4. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function<br><br>2 | Transactional Worker<br><br>2 | Basic Office<br><br>2 | Technical Workstation<br><br>2 |

**Rationale**

The Linux user should not be required to enter network configuration information manually or to reconfigure specific applications manually.

**Description**

The Linux client should be able to auto-configure its network resources upon link state detection. The minimum set of information that the client should be able to auto-configure includes the following:

- IP address
- DNS servers
- Hostname
- Proxy configuration (FTP, HTTP, S-HTTP, SOCKS and so on)
- Mail Servers

The mechanism should support service discovery (via broadcast or other means) for items not covered, or even for items listed. An example mechanism is Lightweight Directory Access Protocol (LDAP).

**References**

Examples:

- Dynamic Host Configuration Protocol (DHCP):
- OpenTalk (Rendezvous): http://developer.apple.com/macosx/rendezvous/
- Implementation of OpenTalk: http://www.porchdogsoft.com/products/howl/

Notes:
In ad hoc or short-lived networks, DHCP isn't required for the automatic configuration of an IP address if the Rendezvous protocol is implemented.

Rendezvous appears to have a limitation of functioning only within individual subnets, so it may not be applicable in a multi-subnet enterprise environment.

| Profile Management | | | |
|---|---|---|---|
| **NS-5.** | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |

| Rationale |
|---|
| Users should be able to automate the reconfiguration of their applications and environment when they change network locations. |
| When the user is connected from a non-secure network, this reconfiguration can be accomplished by using a virtual private network (VPN) or Secure Shell (SSH) to establish a link to a secure environment. Automatic starting and stopping of the services is based on the profile. |

| Description |
|---|
| The Linux client should support the user's ability to re-configure aspects of the system based on network connection changes. Basic network configuration changes should be automated by the system (IP address, DNS entries, default network resources [printers] and so on.) The system should be extendible by the user or by other applications. |

| References |
|---|
| Waproamd: |
| Debian's Laptop-net: |
| Ifplugd: |

| Email Auto-Configuration | | | |
|---|---|---|---|
| **NS-6.** | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |

| Rationale |
|---|
| Ease of use |

| Description |
|---|
| Based on information provided during the network discovery, The Linux system should support auto-configuration of installed email clients, specifically any proxy configuration options. This support includes server and port information, as well as authentication requirements. |

| References |
|---|
| |

| File Transfer Protocol (FTP) | | | |
|---|---|---|---|
| NS-7. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| FTP is used in many environments for file stores and distribution points where user permissions are not required. | | | |
| Description | | | |
| The Linux client should provide support for FTP. | | | |
| References | | | |

| Secure Copy (SCP) Support | | | |
|---|---|---|---|
| NS-8. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| Description | | | |
| The Linux client should provide support for SCP. | | | |
| References | | | |

| Network Printers Discovery | | | |
|---|---|---|---|
| NS-9. | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |

Rationale

Network-attached printers are part of an enterprise deployment.

Description

The Linux system should have the ability to discover available printers on the network.

References

Server Message Block (SMB): http://samba.anu.edu.au/cifs/docs/what-is-smb.html

OpenTalk (Rendezvous): http://en.wikipedia.org/wiki/Apple_Rendezvous

CEPS:

| Ability to Obtain Printer Capabilities | | | |
|---|---|---|---|
| NS-10. | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |

Rationale

Network attached printers are part of an enterprise deployment.

Description

The Linux client should be able to obtain printer capability information from the remote printer and configure its local rasterization layer accordingly.

References

PostScript Printer Description (PPD) for PostScript printers:

Simple Network Management Protocol (SNMP):

Universal Plug and Play (UPnP):

| Auto-Configure Selected Printers | | | |
|---|---|---|---|
| **NS-11.** | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |
| **Rationale** | | | |
| Network-attached printers are part of an enterprise deployment. | | | |
| **Description** | | | |
| Once a network printer has been identified, Linux should auto-configure the printing subsystem (with minimal user intervention) to use the printer. | | | |
| **References** | | | |
| Cisco Enterprise Print System (CEPS): | | | |
| Common UNIX Printing System (CUPS): | | | |
| Line printer daemon (LPD): | | | |
| rlpr: | | | |
| Internet Printing Protocol (IPP): | | | |

| WiFi Support | | | |
|---|---|---|---|
| **NS-12.** | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |
| **Rationale** | | | |
| | | | |
| **Description** | | | |
| Linux should support 802.11a/b/g wireless local area network (LAN) technology infrastructure support. | | | |
| **References** | | | |
| | | | |

## Wired Equivalent Privacy (WEP)

| NS-13. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

The IEEE 802.11 standard is widely deployed, and currently WEP is the most commonly deployed security level.

**Description**

The Linux client should provide tool support to configure WEP keys.

**References**

wconfig (wireless-tools) is an example:
http://www.hpl.hp.com/personal/Jean_Tourrilhes/Linux/Tools.html

## WPA Wi-Fi Protected Access

| NS-14. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

Wi-fi Protected Access (WPA) is the successor for WEP. WPA improves upon (and fixes) the deficiencies in WEP's encryption technique.

WPA is the "test release" of the formal specification for wireless security, 802.11i. The specification, as created by the IEEE Task Group i (TGi).

**Description**

The Linux client should be configured with a supplicant capable of supporting WPA.

**References**

Examples: http://www.wi-fi.org/OpenSection/protected_access.asp

## Wide Area Wireless WAN Support

| NS-15. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function<br>3 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |
| **Rationale** | | | | |
| **Description**<br>Linux should support wireless cards, for example: 1X and 1XEVDO wireless cards. | | | | |
| **References** | | | | |

## Networking Configuration

| NS-16. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| **Rationale**<br>There is a need for a higher level user interface to set the parameters for productivity. | | | | |
| **Description**<br>The network profile configuration should be able to configure networking, including wireless Extended Service Set IDs-ESSIDs. | | | | |
| **References**<br>CUPS: http://www.cups.org/ | | | | |

# Browser

The browser is more than an application. It is a deployment platform for a variety of applications.

## Standards

| EcmaScript 262 Compliance | | | | |
|---|---|---|---|---|
| BR-1. | Significance for User Segments | | | |
| | Fixed Function<br>2 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>EcmaScript is the standard browser scripting language. | | | | |
| Description<br>Linux should support the EcmaScript 262 browser scripting language, to provide a scripting language for dynamic HTML-based applications.<br>Linux should provide language bindings for HTML4, XHTML1.1, CSS1, CSS2.1 and DOM Level 2. | | | | |
| References<br>ECMA-262:  http://www.ecma-international.org/publications/standards/Ecma-262.htm | | | | |

| CSS1 / CSS2 Compliance | | | | |
|---|---|---|---|---|
| BR-2. | Significance for User Segments | | | |
| | Fixed Function<br>2 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>Cascading Style Sheets (CSS) allows web applications to separate the layout look and feel from the base markup. | | | | |
| Description<br>Linux browsers should implement all of CSS1 and CSS2. | | | | |
| References<br>CSS1:      http://www.w3.org/TR/CSS1/<br>CSS2.1:   http://www.w3.org/TR/CSS21/ | | | | |

| XHTML 1.1 (or Better) Support | | | |
|---|---|---|---|
| **BR-3.** | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |

**Rationale**

XHTML is the next generation web content language. Support is absolutely required for complete access to new web content.

**Description**

To provide flexibility for browser use in a variety of environments, Linux should support XHTML 1.1 or better.

**References**

XHTML 1.1: http://www.w3.org/TR/xhtml11/

| Support for HTML 4.0 in Browsers | | | |
|---|---|---|---|
| **BR-4.** | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |

**Rationale**

Hypertext markup language (HTML) 4.0 is the current HTML version standardized by the World Wide Web Consortium (W3C).

**Description**

Desktop Linux browsers should fully implement HTML 4.0 as defined in the reference below.

HTML 4.x implementations should provide appropriate ECMAscript bindings. The decision to track the HTML specification to version 4.01 will be left to the implementer.

**References**

HTML 4.0: http://www.w3.org/TR/html4/

HTML 4.1: http://www.w3.org/TR/1999/REC-html401-19991224/

| Canonical Mime-Type Database Reference | | | |
|---|---|---|---|
| BR-5. | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |

Rationale

Many desktop applications will require some form of database to map applications to specific file types.

Description

Desktop Linux browsers should reference a common mime-type database or file.

References

<br><br>

| XForms Web Forms Support | | | |
|---|---|---|---|
| BR-6. | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |

Rationale

The features in HTML forms no longer currently meet market needs.

Description

Desktop Linux browsers should implement XForms as defined in XHTML 2.0.

References

W3C XForms 1.0: http://www.w3.org/TR/2003/REC-xforms-20031014/

## Security

| Pop Up Blocking | | | |
|---|---|---|---|
| BR-7. | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |

**Rationale**

The implementation of advertising pop ups blocking has been one of the most widely appreciated browser features, giving the user control over advertisement obtrusiveness.

**Description**

Desktop Linux browsers should implement some form of blocking. This should allow users to exercise control over browser behavior when loaded content attempts to open a new window.

A certain amount of flexibility is required since many websites use pop-up windows as a part of their overall design. In these cases, allowing pop-up windows to appear is essential to the successful navigation of these websites.

**References**

# Usability

| Common Plug-In Architecture | | | |
|---|---|---|---|
| BR-8. | Significance for User Segments | | |
| | Fixed Function<br><br>2 | Transactional Worker<br><br>1 | Basic Office<br><br>1 | Technical Workstation<br><br>1 |

Rationale

Many applications need to be able to display HTML/XHTML as part of their normal function. For example, to display help pages. Other applications commonly provide their functionality to the browser by means of a plug in.

To give the user a consistent experience, it is helpful to embed the same functionality the users find in their browser into any such application. To avoid application tie-in to a specific browser, a common plug-in/embedding API is required.

Description

Linux should implement a common plug-in architecture.

References

Mozilla announcement: http://www.mozilla.org/press/mozilla-2004-06-30.html

Plugin project: http://www.mozilla.org/projects/plugins/

Desktop Linux Capabilities

| Capability for Installation of Non-Root Browser Plug Ins | | | |
|---|---|---|---|
| BR-9. | Significance for User Segments | | |
| | Fixed Function  2 | Transactional Worker  1 | Basic Office  1 | Technical Workstation  1 |

**Rationale**

In typical enterprise deployments, end users do not have root privileges.

On shared systems, users should be free to load plug ins of their choice to meet their needs, but this capability should not affect the browser configuration for other users of that system.

**Description**

If the preferences are set correctly, desktop Linux browsers should allow users to install and de-install plug ins without the need to have root permissions.

An individual user's plug in installation will be private to that user, which allows any one user to have a set of plug ins that is different from that of any other user on the system.

The system administrator may install a set of system-wide default plug ins.

**References**

| Pre-Installed Plug Ins for Browsers | | | |
|---|---|---|---|
| BR-10. | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |

Rationale

A small number of technologies are so widely used across internet websites that their supporting technologies (plug ins) are virtually required for users to successfully view a full range of content.

To avoid user frustration at having to locate and install these plug ins, they should be provided with the default installation of a browser.

Description

Regardless of operating system architecture (32-bit vs. 64-bit processor and so on), desktop Linux browsers should provide a set of basic plug ins that can optionally be installed for system-wide availability.

The provided plug ins should include the following:

- Flash
- PDF
- Java

References

## Browser Embedding API

| BR-11. | Significance for User Segments | | | |
| --- | --- | --- | --- | --- |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 2 | 1 | 1 | 1 |

**Rationale**

Many applications need to be able to display HTML/XHTML as part of their normal function. For example, to display help pages. Other applications commonly provide their functionality to the browser by means of a plug in.

To give the user a consistent experience, it is helpful to embed the same functionality the users find in their browser into any such application. To avoid application tie-in to a specific browser, a common plug-in/embedding API is required.

**Description**

Desktop Linux should provide a common application program interface (API) that allows a browser to be embedded in applications.

**References**

Embedding Mozilla: http://www.mozilla.org/projects/embedding/

## Auto-Configuration of Installed Browsers

| BR-12. | Significance for User Segments | | | |
| --- | --- | --- | --- | --- |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 2 | 2 | 2 | 2 |

**Rationale**

This feature is required for ease of use.

**Description**

The Linux system should support auto-configuration of installed browsers. Auto-configuration should be based on information provided during the network discovery, specifically any proxy configuration options.

**References**

| HTTP, S-HTTP, FTP, and Proxy Support | | | |
|---|---|---|---|
| BR-13. | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale | | | |
| Description | | | |
| A Linux system should provide a browser capable of supporting the HTTP, S-HTTP and FTP protocols, as well as standard HTTP and FTP proxy. | | | |
| References | | | |

| Extendable Protocol/Mime-Type Handler | | | |
|---|---|---|---|
| BR-14. | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |
| Rationale | | | |
| Linux needs the ability to handle the Real-Time Streaming Protocol (RTSP), the H.323 teleconferencing protocol and other protocols. | | | |
| Description | | | |
| A Linux browser should be extendable to support integration with additional protocols, either through embedded support or through external application handoff. | | | |
| References | | | |

# Installer

## Compatible Install Package Format

| Distribution-Independent Installer | | | |
|---|---|---|---|
| IN-1. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| Distribution-specific issues that could cause incompatibilities from one Linux distribution to the next would place a large testing burden on users. These issues would also present a risk that users could be locked in to a specific vendor if they could not afford that level of testing. | | | |
| Description | | | |
| Desktop Linux software should use an installation package format that is installable on any common Linux distribution. | | | |
| References | | | |
| | | | |

| Dependency Chain Capability at Install | | | |
|---|---|---|---|
| IN-2. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| It is important to ensure that appropriate co-requisite and pre-requisite chains are followed at Linux install. This will ensure appropriate installation, depending upon the kernel or Window System. | | | |
| Description | | | |
| The Linux installation system package should specify its dependencies. | | | |
| References | | | |
| | | | |

| Standard Linux Package Naming | | | |
|---|---|---|---|
| IN-3. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| It is important to prevent collision among package names between vendors, systems and distributions. | | | |
| Description | | | |
| Linux system and ISV packages should utilize the same Linux naming schemes. This will drive the standardization of package naming beyond the scope of the LSB 2.0 specification. | | | |
| References | | | |

| Menu Installation Capability | | | |
|---|---|---|---|
| IN-4. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| To load a piece of software, one needs to install a menu item. | | | |
| Description | | | |
| The Linux installation software should be capable of adding a menu on a user's desktop. | | | |
| References | | | |

# User Installable Software

| Software Installation Capability | | | |
|---|---|---|---|
| IN-5. | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>Operating environments are dynamic. Systems need to be refreshed on a regular basis. | | | |
| Description<br>Linux distributions should provide means to install add-on software after the initial operating system installation phase. | | | |
| References | | | |

| Automatic and Consistent Installation | | | |
|---|---|---|---|
| IN-6. | Significance for User Segments | | |
| | Fixed Function<br>2 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>To reduce the learning curve and the amount of manual intervention for users, the Linux GUI installer should start automatically and function consistently, regardless of the medium, location and protocol from which it's being installed (local disk, CD-ROM, network and more). The installer must be able to install itself plus any other application and kernel Linux code. | | | |
| Description<br>The Linux installer should install any software using the appropriate preferences and package naming schemes. | | | |
| References | | | |

| Installations Authorized for Any User | | | |
|---|---|---|---|
| IN-7. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 2 | 1 | 1 | 1 |

Rationale

It is important for Linux to support the capability for users to install software as a completely flexible configuration, for enterprises that would like this feature.

Description

A desktop user should be able to install and update any Linux software, whether from ISVs or Linux system kernel, without being a root user.

References


| Customized Installations | | | |
|---|---|---|---|
| IN-8. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 2 | 1 | 1 | 1 |

Rationale

The primary purpose of the GUI installer is to make it easy for a non-technical user to install the software with just a few clicks and few (if any) choices. However, advanced users might want to install "code" in locations other than the default.

Description

The Linux GUI installer should enable advanced users to customize the install.

References

| Command-Line Based Software Installation | | | |
|---|---|---|---|
| IN-9. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 2 | 1 | 1 | 1 |
| **Rationale** <br><br> In order to perform scripted installation for remote or automated installation or for automated testing of installation processes, it is valuable to have command-line installation mechanisms. <br><br> Command-line tools are easier to script or run through non-graphical terminals. Furthermore, GUI tools are not usable for some, due to hardware, accessibility, personal preference and so on. Command-line tools provide a possible alternative for these users. | | | |
| **Description** <br><br> The same functionality provided for Linux installation through GUI mechanisms should also be available from command line tools. | | | |
| **References** | | | |

| Package Relocation | | | |
|---|---|---|---|
| IN-10. | Significance for User Segments | | |
| | Fixed Function 2 | Transactional Worker 2 | Basic Office 2 | Technical Workstation 2 |

**Rationale**

In order to standardize an environment and reduce administration costs, certain sites may define constraints regarding where software can reside. At these sites, which include large installations, it's common to see extra add-on software reside on separate disks and totally non-standard directories. Packages should be flexible enough to run out of user-defined directories.

**Description**

Desktop Linux users should have the option to relocate Linux packages in the directory of their choice. Non-system critical packages containing optional add-on software fall under this category.

System critical packages that absolutely must be installed in a certain directory will be marked as non-relocatable. Relocatable packages will be marked as such in the package description section.

For example, it should be possible to install Apache into any directory, given that there's enough space on the file system. Startup files provided with the package will make note of this and point to the correct location.

**References**

# Remote Deployment

| Client "Pull" Deployment of Software | | | |
|---|---|---|---|
| **IN-11.** | Significance for User Segments | | |
| | Fixed Function<br><br>2 | Transactional Worker<br><br>1 | Basic Office<br><br>1 | Technical Workstation<br><br>1 |
| **Rationale** | | | |
| The "pull" method of deploying software is a common way to handle remote automated software installation from a server to a client. The client pulls down system and application updates and then calls the installer. | | | |
| **Description** | | | |
| If so configured, a Linux desktop system will periodically poll a central server for updates and initiate installation. | | | |
| **References** | | | |
| | | | |

| Server "Push" Deployment of Software | | | |
|---|---|---|---|
| **IN-12.** | Significance for User Segments | | |
| | Fixed Function<br><br>2 | Transactional Worker<br><br>2 | Basic Office<br><br>2 | Technical Workstation<br><br>2 |
| **Rationale** | | | |
| In some scenarios, a machine might not have an associated user, such as in the case of kiosk machines or general access machines. In other situations, users might not be involved in the administration of the computer at all, in which case full control over the software deployment needs to be entirely in the hands of system administrators. | | | |
| Thus there is a need for unattended remote deployment of software to a desktop machine. | | | |
| **Description** | | | |
| If so configured, system software will be "pushed" to a client location and then installed there at a predetermined time. | | | |
| **References** | | | |
| | | | |

## Remote System Imaging Mechanism

| IN-13. | Significance for User Segments | | | |
|--------|-------------------------------|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

When a system needs to be completely reinstalled from scratch, a remote system imaging mechanism allows the system to be rebuilt via an automated process initiated from a remote server.

**Description**

Remote Linux systems should have the ability to be imaged.

For example, System Imager is a commonly used application for performing remote installs in data center and cluster environments.

**References**

## Remote System Configuration

| IN-14. | Significance for User Segments | | | |
|--------|-------------------------------|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

If a desktop is used as a fixed function desktop, it is important to be able to update the configuration remotely.

**Description**

When permitted, Linux systems should have their configuration information updated remotely.

**References**

| Remote System Hardware Management | | | |
|---|---|---|---|
| IN-15. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

When performing remote or automated management of a desktop system, it can be necessary to perform hardware and system-level operations such as turning the machine on or off, configuring or upgrading the BIOS and so on. Being able to do perform these functions remotely (and automatically) enables this management to be scripted.

**Description**

If configured to do so, desktop Linux systems will permit remote system management (including power control) via the software installer. This will occur to the extent allowed by the hardware.

**References**

# Uninstallation

| Complete Local Uninstallation | | | |
|---|---|---|---|
| IN-16. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

On a stable desktop system, uninstallation of packages that do not completely uninstall can result in an increasing amount of extraneous files and configuration entries piling up in the system. This situation can make troubleshooting difficult. Applications should make every effort to completely "clean up after themselves."

**Description**

Linux packages should uninstall themselves from the system completely, which includes removal of binaries, configuration files, menu entries and directories.

**References**

## Safe Uninstallation

| IN-17. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

Rationale

Occasionally an application needs to make configuration changes during installation, but removal of a configuration file would leave the system in an inconsistent state. In these cases, the application should undo the changes it has made, and the removal should not cause the system to become inconsistent.

Description

During install or uninstall, Linux users will be able to backout of any changes and leave the system in its original state.

References

## Complete Remote Un-Installation

| IN-18. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

Rationale

In large computing environments, it is necessary to have a centralized means of system management. The ability to uninstall software remotely from clients is an important part of this goal. An administrator sitting at the central management console should be able to designate a client machine on a network, and be able to perform a software uninstall on the client machine as though he or she was logged in to it locally.

Description

Linux packages should be capable of being uninstalled remotely. The uninstall will be invoked from a central location. Un-installation will be complete and it will include removal of binaries, configuration files and directories.

References

# Upgrade

| Safe Upgrading by Replacement | | | |
|---|---|---|---|
| IN-19. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| Description | | | |
| Newer versions of upgradeable Linux packages should be installed in the same locations as legacy Linux packages and the legacy packages should be replaced. If configuration files need to be modified as part of the upgrade, for instance if the file syntax has changed between versions, the original file should be recoverable. | | | |
| References | | | |

# Application Services

| Invoke Applications from Remote Servers | | | |
|---|---|---|---|
| IN-20. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |
| Rationale | | | |
| The X Window System permits using GUI applications from a different machine by use of a network protocol and DISPLAY setting. This can be handy when the system administrator wishes to maintain, configure and upgrade the application on a single machine instead of across a collection of desktop systems. For example, the application might require more powerful resources than available on the desktop machine, or it might be dictated by license or security issues. | | | |
| Description | | | |
| The Linux desktop user should be able to invoke applications installed on a remote server. The user should be able to access remote server applications in a manner similar to accessing other applications, such as via entries in the start menu, from the command-line and so on. | | | |
| References | | | |

# System Installation

| Installation Types | | | |
|---|---|---|---|
| IN-21. | Significance for User Segments | | |
| | Fixed Function<br><br>1 | Transactional Worker<br><br>2 | Basic Office<br><br>2 | Technical Workstation<br><br>2 |

Rationale

Linux is the fastest growing desktop OS. When installing, it should assume that the user may want it to coincide with other OSs as well as residing with multiple copies of itself on one system.

Description

There should be three types of Linux installations: pristine installations (these format the entire partition and lay down a new system image); installations that replace an existing Linux image; and installations that upgrade an existing image.

In the case of the upgrade installation, the installation process should take place without destroying existing user definitions and application configurations. The installer will update one partition and leave other partitions alone.

References


| Multiple OS Boot Support | | | |
|---|---|---|---|
| IN-22. | Significance for User Segments | | |
| | Fixed Function<br><br>1 | Transactional Worker<br><br>2 | Basic Office<br><br>2 | Technical Workstation<br><br>2 |

Rationale

A user might require multiple boot options.

Description

In scenarios where multiple operating systems will exist on a single machine, at the end of the Linux installation process, Linux should ask if a multi-OS loader should be installed and configured. Based upon the user's choice, the multi-OS loader can be installed and the user will be prompted through configuration dialogs.

Lilo and Grub are examples of loaders that perform this operation.

References

| Installation Options for System Features | | | |
|---|---|---|---|
| IN-23. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

At the point of installation, users and administrators have different needs regarding system features.

**Description**

During local Linux installation, three options should be offered to the user: express installation, complete installation and custom installation.

The express option will install the system and applications determined by the distributors and/or the enterprise. The complete installation will install the Linux OS and all its optional components, including applications defined by the distributor and/or the enterprise. The custom option will take the user to a GUI panel from which the user can chose the components they wish to install.

**References**

| Addition and Removal of System Features | | | |
|---|---|---|---|
| IN-24. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

After installation, a user or administrator might need to alter the Linux kernel and/or applications via a GUI or script.

**Description**

After the Linux system installation is complete, a desktop user can install or remove software via GUI dialog or script.

**References**

## Installation Recovery Checkpoints

| IN-25. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

Rationale

Due to the length of installation, the installation process should checkpoint itself. If a failure occurs, the next installation attempt should prompt the user or administrator to resume at the checkpoint or start at the beginning.

Description

During Linux installation, the process should set checkpoints as it progresses. If a failure occurs and a restart is required, upon the next attempt to perform the installation, the installer will prompt the user to either resume or start again. If the user starts again, the process will remove the previous installation elements and begin the installation from the beginning.

References

## Non-Destructive Upgrade

| IN-26. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

Rationale

The system upgrade process should be able to be canceled and support should be able to be rolled back.

Description

Linux system upgrades should be conducted on a fairly regular basis. During upgrade, a cancel process should be available in the case the user decides to cancel or if an error situation arises (for example, if the device is running low on disk space). The cancel process will restore the system to the state it was before the upgrade process began.

At times, after a user has attempted an upgrade, problems occur that weren't present before the upgrade. In these cases, the system should provide an option to roll back to a previous version.

References

## Non-Destructive Drive Partitioning

| IN-27. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function<br>1 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |

**Rationale**

A non-destructive partitioning tool should be available with Linux.

**Description**

Many early implementations of Linux on the desktop should include pilots and migrations from Windows. Therefore, part of the Linux installation tools will be a disk-partitioning tool that performs non-destructive drive partitioning.

**References**


## glibc / Kernel Dependency

| IN-28. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function<br>2 | Transactional Worker<br>2 | Basic Office<br>2 | Technical Workstation<br>2 |

**Rationale**

GLIBC and kernel version differences are the primary cause of software incompatibilities, and expressing them explicitly is necessary to enable a user to select the appropriate version. Some applications require only basic functions that work across a variety of glibc versions, whereas other applications require more specific functionality available only in particular glibc versions.

Distinguishing these different classes will help users and developers communicate the dependencies. It would be ideal if there were a way to express this dependency without requiring user knowledge of glibc and the kernel.

**Description**

The Linux installation package should indicate its glibc and kernel dependence as either any version, a set of versions or a specific version.

**References**

## Dependency Delegation

| IN-29. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 2 | 2 | 2 | 2 |

Rationale

If an installed package calls for a particular version of a dependency (such as MySQL) but a newer version is present on the system, then the installer should request and use the newer version.

Description

The installed Linux package should make use of existing distribution-provided packages as much as possible.

References

## Co-Requisite/Prerequisite Dependency Capability

| IN-30. | Significance for User Segments | | | |
|---|---|---|---|---|
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

Rationale

It is necessary for appropriate co-requisite/prerequisite chains to be developed so that software will install appropriately depending upon the Kernel/Window System.

Description

The Linux installation package system should completely specify its dependencies.

References

# Accessibility

| Screen Reader | | | |
|---|---|---|---|
| AC-1. | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>In the United States, screen readers for blind and visually impaired people are required per S508 legislation. The European Agency for the Evaluation of Medicinal Products (EMEA) markets are defining similar public policy based on W3C Guidelines. Asia-Pacific policy is just being formed | | | |
| Description<br>Desktop Linux should include a screen reader. The screen readers should be available for major international languages. | | | |
| References<br>IBM Home Page Reader: http://www-306.ibm.com/able/solution_offerings/hpr.html | | | |

| Text to Speech Functionality | | | |
|---|---|---|---|
| AC-2. | Significance for User Segments | | |
| | Fixed Function<br>1 | Transactional Worker<br>1 | Basic Office<br>1 | Technical Workstation<br>1 |
| Rationale<br>In the United States, automatic conversion of text streams to voice (text to speech or TTS) is required per S508 legislation. The European Agency for the Evaluation of Medicinal Products (EMEA) markets are defining similar public policy based on W3C Guidelines. Asia-Pacific(A/P) policy is just being formed | | | |
| Description<br>Linux should provide TTS functionality for all application types delivered by client segmentation. | | | |
| References<br>IBM Home Page Reader: http://www-306.ibm.com/able/solution_offerings/hpr.html | | | |

| Accessibility Functions | | | |
| --- | --- | --- | --- |
| AC-3. | Significance for User Segments | | |
| | Fixed Function | Transactional Worker | Basic Office | Technical Workstation |
| | 1 | 1 | 1 | 1 |

**Rationale**

In the United States, screen readers for blind and visually impaired people are required per S508 legislation. The European Agency for the Evaluation of Medicinal Products (EMEA) markets are defining similar public policy based on W3C Guidelines. Asia/Pacific(A/P) policy is just being formed

**Description**

Linux should supply assistive technologies and maintenance on the technologies. Technologies include scripting and full screen magnification.

**References**

X.Org Foundation: http://www.X.org

# Future Topics

The following topics are areas under consideration for inclusion in future revisions of this document. Either these topics fall outside of the high level capabilities focus of this document, or the working group feels they have insufficient expertise to address the issues at this time.

As a reader of this document, if you feel you have appropriate expertise in any of these areas, we encourage your participation in the working group.  Contact the DTL initiative: mailto:dtl_discussion@lists.osdl.org

Whether or not these items are addressed in the next revision of this document is highly dependent upon the availability of appropriate expertise.

This list is not an exhaustive list of topics for the next revision. Topics not covered here will be included, and items listed here may not be included, for any one of a long list of reasons.

- Dependency delegation—use the latest revision of packages whenever possible
- Dependency generalization—satisfy dependencies on any distribution
- Dependency specification for pre/post installation
- Configuration reversion
- Access control policy services
- Global, user and application font management
- Multi-media instant messaging
- Web conferencing
- Webcasting
- VoIP—including firewall (iptables) SIP support
- Multimedia receiving architecture
- Embeddable application architecture/framework
- Common codec architecture.
- Multimedia performance tuning—latency, scheduling and so on
- DRM
- 3D Multimedia support
- Multimedia editing/authoring support
- Vector animation fonts
- Color management
- "Standard e-mail architecture"—SMTP, IMAP, POP3 – mailstore standards
- WebDAV
- Automatic resource discovery architecture
- CIFS
- CIFS Authentication
- Rsync
- Kernel independence
- Driver on demand
- Signed drivers
- Interoperability