

# Вступление

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# Об этом руководстве

Это руководство призвано облегчить Ваше первое знакомство с . Изучите различные части данного руководства, чтобы научиться устанавливать, использовать и получать удовольствие при работе с системой.

## Установка и настройка

Руководство проведет вас через весь процесс установки и базовой конфигурации системы. Представит YaST, центральный инструмент для установки и конфигурации системы. Здесь вы узнаете, как создать или изменить ключевые компоненты системы и как подключиться к Интернет.

## Основы

Эта часть в основном предназначена для тех пользователей, которые переходят на Linux с других операционных систем. Здесь описаны основные концепции, такие как концепция пользователей в Linux, структура файловой системы и права доступа для файлов и каталогов. Также приведены основы работы с оболочкой, однако она едва ли понадобится для взаимодействия с системой в настоящее время.

## Помощь и решение проблем

Здесь представлены общие сведения о том, где найти помощь и документацию в случае необходимости получения дополнительной информации, или для выполнения конкретных задач в системе. Также эта часть содержит подборку наиболее часто возникающих проблем и ошибок и варианты их решения.

Это руководство описывает .

Многие главы этого руководства содержат ссылки на дополнительные источники. К ним относятся как документация которая доступна в системе, так и документация доступная в Интернет.

Для обзора доступной документации, а также доступных обновлений текущей документации, посетите <http://www.novell.com/documentation/opensuse121> или в следующем разделе.

## 1 Доступная документация

Мы предоставляем HTML и PDF-версии наших книг на разных языках. Для данного дистрибутива доступны следующие руководства для пользователей и администраторов:

### Вступление (стр. i)

Руководство шаг за шагом проведет Вас через установку с DVD или из ISO-образа, даст краткое введение в окружения рабочего стола GNOME и KDE, включая некоторые ключевые приложения. Также познакомит с LibreOffice и его модулями для создания текста со сложным форматированием, работы с электронными таблицами или создания графики и презентаций.

## Содержание (†Содержание)

Даёт общее понимание работы , затрагивая задачи продвинутого системного администрирования. Его материал предназначен в первую очередь для системных администраторов и домашних пользователей, обладающих базовыми навыками администрирования. Содержит детальную информацию о продвинутых вариантах развертывания, администрирования, взаимодействия ключевых компонентов и настройке различных сетевых и файловых служб .

## Руководство по безопасности (†Руководство по безопасности)

Описываются основные понятия системы безопасности, охватывающей как локальные, так и сетевые аспекты. Показывается, как использовать такие утилиты для обеспечения сетевой безопасности, как AppArmor (которая позволяет определить к каким файлам заданная программа будет иметь доступ на запись, чтение или выполнение) или система аудита, которая тщательно собирает информацию о событиях, так или иначе связанных с обеспечением надлежащего уровня безопасности системы.

## System Analysis and Tuning Guide (†System Analysis and Tuning Guide)

Руководство администратора по обнаружению проблем, их разрешение и оптимизация работы. В нем найдется информация о том, как проверить и оптимизировать работу системы с помощью специальных инструментов, эффективно управлять ее ресурсами. Также в нем содержится обзор общих проблем и их решений, а также дополнительные справочные материалы и обзор доступных ресурсов.

## Виртуализация с KVM (†Виртуализация с KVM)

Данное руководство предлагает краткое описание настройки и управления системой виртуализации на базе KVM (Kernel-based Virtual Machine) в . Также показывается, как управлять VM Guest с помощью libvirt и QEMU.

Большинство HTML-версий руководств в установленной системе можно найти по адресу `/usr/share/doc/manual` или в справочном центре используемого окружения рабочего стола. Последние обновления документации доступны по адресу <http://www.novell.com/documentation>, где можно загрузить в PDF или HTML-версии руководств для конкретного продукта.

# 2 Обратная связь

Некоторые из доступных каналов обратной связи:

## Ошибки и запросы об улучшениях

Чтобы сообщить об ошибке или отправить запрос об улучшении, пожалуйста, используйте <https://bugzilla.novell.com/>. Чтобы сообщить о найденной ошибке в документации отправьте отчет для компонента Documentation (Документация) соответствующего продукта.

Если вы плохо знакомы с Bugzilla, то для вас могут оказаться полезными эти статьи:

- [http://ru.opensuse.org/openSUSE:Сообщить\\_об\\_ошибке](http://ru.opensuse.org/openSUSE:Сообщить_об_ошибке)
- [http://ru.opensuse.org/openSUSE:Сообщить\\_об\\_ошибке\\_FAQ](http://ru.opensuse.org/openSUSE:Сообщить_об_ошибке_FAQ)

#### Комментарии пользователей

Мы хотим услышать ваши комментарии и предложения об этом руководстве и другой документации, поставляемой с данным продуктом. Используйте поле ввода в нижней части на каждой странице онлайн-документации или перейдите по ссылке <http://www.novell.com/documentation/feedback.html> и оставьте свой комментарий.

## 3 Условные обозначения

В данном руководстве используются следующие типографские соглашения:

- `/etc/passwd`: имена каталогов и файлов
- *заполнитель*: замена *заполнитель* на фактическое значение
- `PATH`: переменная окружения `PATH`
- `ls, --help`: команды, опции и параметры
- `user`: пользователи или группы
- `[], [] + [F1]`: клавиша или клавиатурная комбинация; названия клавиш показаны в верхнем регистре, как на клавиатуре
- Файл, Файл > Сохранить как: пункты меню, кнопки
- Танцующие пингины (Глава Пингины, ↑Другое руководство): это ссылка на главу в другом руководстве.

## 4 О создании этого руководства

Эта книга была создана в Novdoc, основан на DocBook (смотрите <http://www.docbook.org>). Исходные XML-файлы проверяются программой `xmllint`, обрабатываются `xsltproc` и преобразовываются в XSL-FO с использованием специализированной версии таблиц стилей Нормана Уолша (Norman Walsh). Конечный PDF-файл отформатирован через XEP от RenderX. Инструменты с открытым исходным кодом и среда, используемая для создания этого руководства, доступны в пакете `susedoc`, поставляемом в составе .

## 5 Исходный код

Исходный код находится в открытом доступе. По следующему адресу доступны ссылки на загрузку и дополнительная информация [http://ru.opensuse.org/Исходный\\_код](http://ru.opensuse.org/Исходный_код).

## 6 Благодарности

Разработчики Linux сотрудничают с огромным числом добровольцев по всему миру, чтобы способствовать развитию Linux. Мы благодарны им за приложенные усилия — этот дистрибутив не существовал бы без них. Кроме того, мы благодарим Фрэнка Заппа (Frank Zappa) и Павар (Pavar). Особая благодарность, конечно же, выражается Линусу Торвальдсу (Linus Torvalds).

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Have a lot of fun!

Ваша команда SUSE



## Часть I. Установка и первые шаги



## 1 Установка. Быстрый старт

Используйте описанные ниже действия для установки новой версии . Этот документ вводит информацию о том, как запустить напрямую запустить систему установки .

### 1.1 Добро пожаловать в

Для получения более детальных инструкций по установке, обратитесь к документации по адресу <http://www.novell.com/documentation/opensuse114/>.

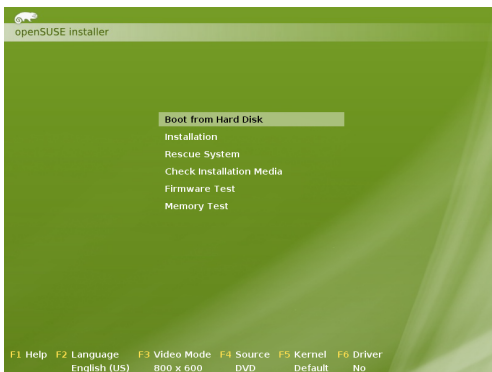
#### 1.1.1 Системные требования

- Pentium® III 500 МГц или более мощный (рекомендуется Pentium 4 2.4 ГГц или мощнее или любой процессор поддерживающий набор инструкций AMD64 или Intel® EM64T)
- 512 МБ оперативной памяти (рекомендуется 1 ГБ)
- 3 ГБ доступного места на жестком диске (рекомендуется больше в зависимости от количества устанавливаемых программ)
- Разрешение экрана 800 x 600 пикселей (рекомендуется 1024 x 768 или больше)

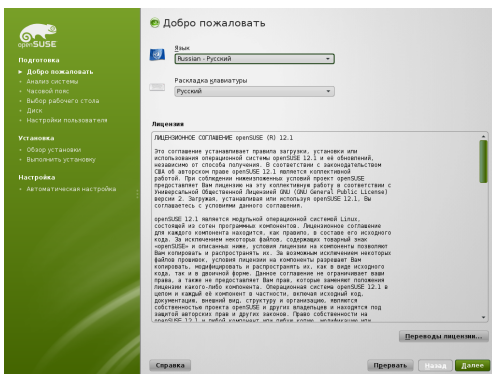
#### 1.1.2 Установка

Используйте эти инструкции, если на компьютере не установлены другие Linux системы или, если необходимо заменить существующую Linux систему.

- 1 Вставьте DVD с в привод и перезагрузите компьютер для запуска программы установки.

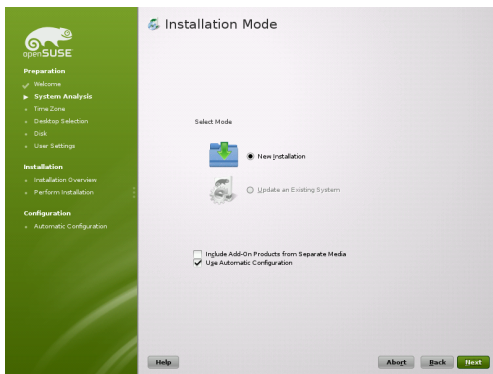


- 2 Выберите Установка на экране загрузки и нажмите [Enter]. Это приведет к загрузке и запуску процесса установки в обычном режиме.

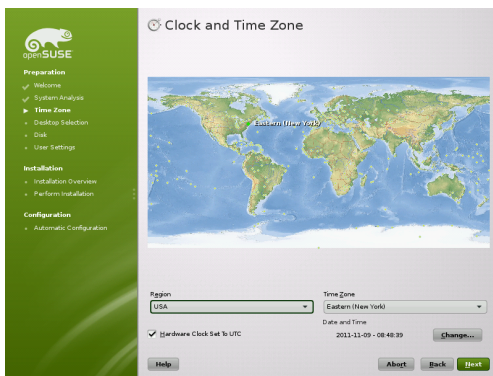


- 3 Выберите язык и раскладку клавиатуры, которые будут использоваться в процессе установки и в установленной системе.

Прочтите лицензионное соглашение и, если вы принимаете его условия, то перейдите к следующему шагу нажав Далее. В противном случае нажмите Прервать для завершения установки.



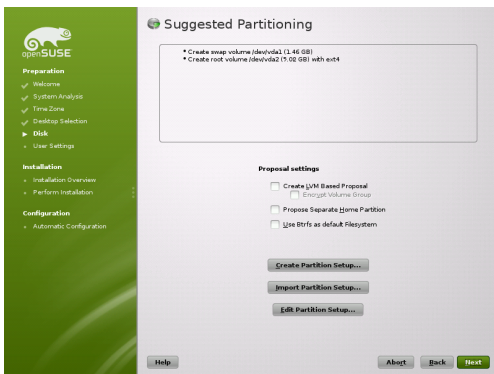
4 Выберите Новая установка и нажмите Далее.



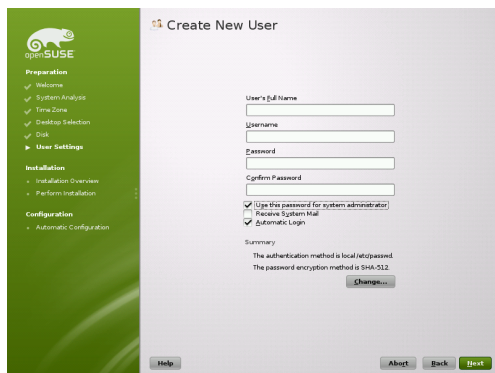
5 Используйте карту или выпадающие списки Регион и Часовой пояс, чтобы задать нужное время и часовой пояс. Затем нажмите Далее.



- 6 Выберите предпочитаемое окружение рабочего стола. KDE и GNOME — мощные окружения рабочего стола, похожие на Windows; другие варианты доступны в меню Другое. Затем нажмите Далее.



- 7 На этом этапе предлагается определить раздел для установки. В большинстве случаев предлагаемый системой вариант может быть использован без каких-либо изменений. Для принятия данной разметки нажмите Далее для перехода к следующему шагу. Опытные пользователи могут отредактировать схему разметки диска (Редактировать разметку...) или создать собственную схему (Создать разметку).

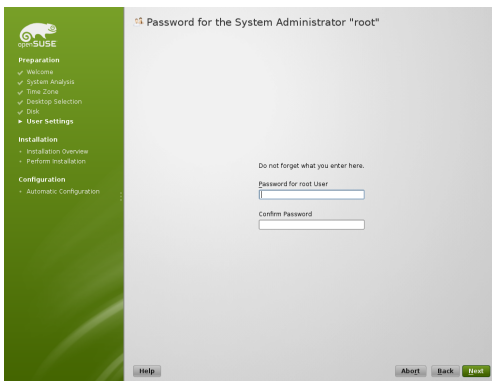


- 8 Введите свои имя и фамилию в поле Полное имя пользователя, имя пользователя и пароль, соответственно, в поля Имя пользователя и Пароль.

В целях безопасности, пароль должен состоять из заглавных и строчных букв и цифр. Его длина должна быть не меньше восьми символов. Пароли чувствительны к регистру. Для продолжения нажмите Далее.

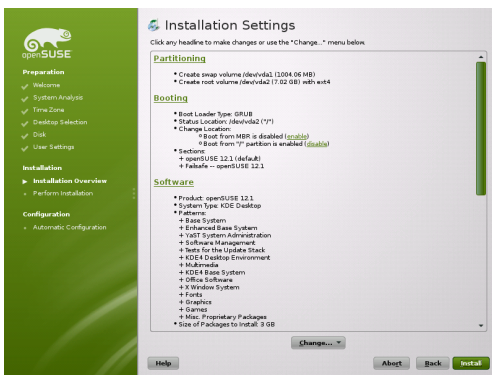
По умолчанию, указанный здесь пароль также используется в качестве пароля администратора системы — `root`. Отключите данную опцию, если необходимо задать другой пароль для супер-пользователя `root` (это можно будет сделать на следующем шаге).

При активации автоматического входа после включения системы будет загружен ваш рабочий стол, без какой-либо авторизации. Если в компьютере хранится важная информация, то эту опцию необходимо отключить, так как посторонние люди могут получить доступ к этим конфиденциальным данным.



- 9 Введите пароль для учетной записи администратора (также называемой пользователем `root`). Этот шаг может быть пропущен, если была активирована опцию Использовать этот пароль для системного администратора на предыдущем шаге.

При утере пароля пользователя `root` его уже нельзя будет восстановить. Можно будет только сбросить его при наличии прав администратора системы. Для перехода к следующему шагу нажмите Далее.

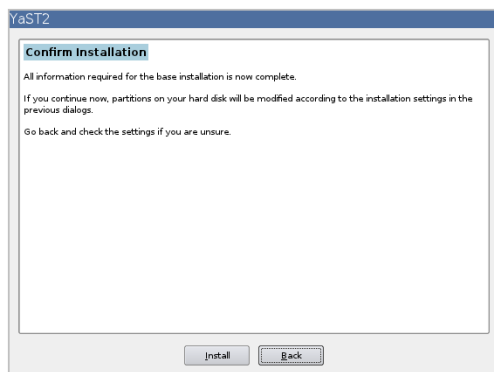


- 10 На экране параметров установки будут выведены сделанные установки, среди которых так же присутствуют настройки установленные автоматически. При необходимости, внесите нужные изменения.

Нажмите Установка, чтобы продолжить. В зависимости от выбранного программного обеспечения, может быть предложено принять дополни-



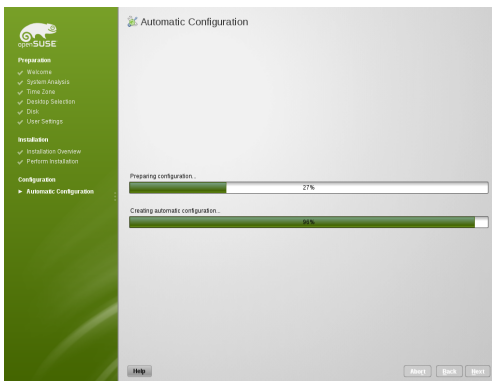
тельные лицензионные соглашения (кнопка Принять). Перед началом запуска потребоваться подтвердить выбранные параметры установки:



11 Нажмите Установка для запуска установки.



12 Обычно установка длится от 15 до 30 минут, в зависимости от производительности системы и выбранного программного обеспечения. В процессе установки можно сократить время за изучением презентации, примечания к выпуску или просмотром подробного журнала установки.



- 13 После завершения установки всех выбранных пакетов программного обеспечения будет загружена новая система и произведена автоматическая настройка, как например, настройка сетевой подсистемы, доступа в Интернет и определение настроек оборудования. Этот этап выполняется полностью автоматически и не требует участия пользователя.



- 14 Если на этапе задания установок был выбран автоматический вход в систему, то рабочий стол будет загружен сразу. В противном случае загрузка прервется на экране входа в систему. Нажмите на имени указанного при установке пользователя и введите пароль в поле Пароль. Нажмите [Enter], чтобы выполнить вход в систему.

## 2 KDE Быстрый старт

предоставляет пользователям Linux\* утилиты, в которых они нуждаются ежедневно. Они (утилиты) поставляются вместе с удобным в работе графическим окружением (рабочий стол KDE\*) облегчающим общение с системой Linux: доступ и управление файлами, каталогами и программами. предоставляет интегрированный набор приложений для широкого круга задач (офис, мультимедиа, Интернет). Так же включен пакет приложений LibreOffice, который позволяет редактировать и сохранять файлы во многих форматах. Поскольку этот набор офисных приложений доступен для нескольких операционных систем, то можно использовать одни и те же данные на различных компьютерных платформах.

### 2.1 Вступление

Когда вы запускаете систему, обычно запрашиваются имя пользователя и пароль. Если вы не устанавливали систему самостоятельно, узнайте у системного администратора ваши имя пользователя и пароль.

После первого входа в KDE вы увидите рабочий стол KDE, на котором представлены следующие основные элементы:



**Папка "Рабочий стол":** По умолчанию, виджет Рабочий стол отображает содержимое каталога ~/Рабочий стол. При помещении файла в эту директорию, он сразу отобразится в виджете.

Контекстное меню рабочего стола: Нажмите правой кнопки мыши на пустом месте рабочего стола, чтобы вызвать контекстное меню и настроить внешний вид рабочего стола, добавить панели или виджеты, изменить настройки рабочего стола, заблокировать виджеты в их текущем положении на рабочем столе, завершить текущий сеанс или заблокировать экран.

Инструментарий рабочего стола: Переместите указатель мыши к значку в верхнем правом углу рабочего стола, чтобы вызвать меню, с помощью которого можно добавить или удалить виджеты.


Панель KDE: По умолчанию, панель на рабочем столе KDE состоит из изображения Главного меню слева, далее расположены виджеты и значки программ, а так же значок настроек меню справа. Если подвести курсор мыши к любому значку на панели, то появится краткое описание.

Главное меню Нажмите на кнопку в левом нижнем углу панели, чтобы открыть главное меню. Главное меню состоит из следующих элементов: функции поиска вверху и нескольких вкладок внизу, обеспечивающих быстрый доступ к основным функциям меню. Дополнительно, в меню отображается имя пользователя и сетевое имя машины.

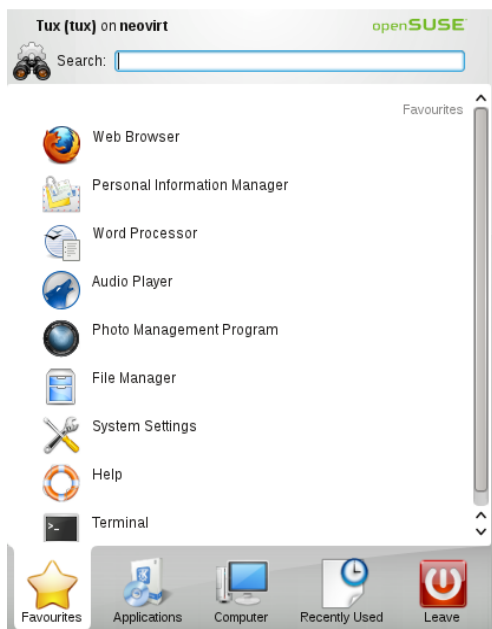
## 2.2 Запуск программ

Для запуска программ из Главного меню или командной строки, используйте оболочку или диалог Выполнить команду. Дополнительно, можно запустить программы с рабочего стола или панели по нажатию на значке программы.

### 2.2.1 Работа с главным меню

Для открытия Главного меню, нажмите на значок Главное меню на панели или нажмите  + [F1].

На вкладке Избранное отображаются, выбранные по умолчанию, основные программы для быстрого доступа, тогда как Приложения показывает все приложения установленные в системе. Для перемещения по структуре меню, нажмите на элемент и используйте значки в виде стрелки вправо или влево, чтобы перейти назад или вперед. Компьютер и Последние предоставляют быстрый доступ к некоторым часто используемым местам, приложениям или документам. Выход показывает несколько опции выхода из системы, такие как завершение сеанса, блокирование экрана (доступ можно получить только снова введя пароль), выключение или перезагрузка компьютера. Возможно приостановление работы компьютера с сохранением сессии в памяти или на диск.

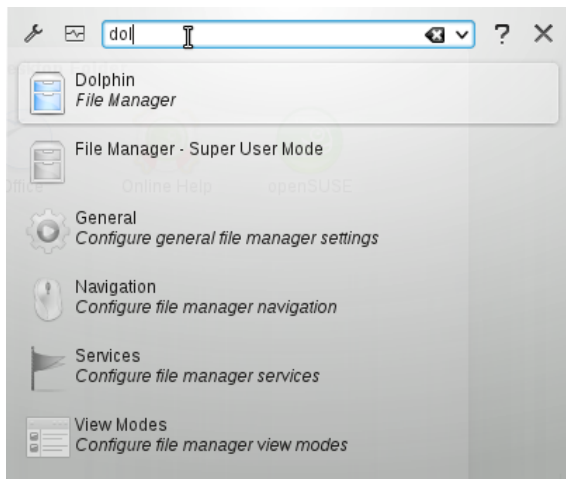


Если часто требуется какая-то программа и вы не хотите рыться в структуре меню в поисках этой программы, то просто добавьте ее ярлык на вкладку избранное. Нажмите правой кнопкой мыши на значке этой программы и выберите Добавить в избранное.

## 2.2.2 Использование диалога "Выполнить"

KRunner - приложение помощник позволяющее быстро запустить нужную программу. Кроме того, эта программа предлагает функцию поиска и вы легко сможете найти нужное приложение.

Нажмите **[ ] + [F2]** для открытия диалога Выполнить команду. Введите нужную команду, например, `dolphin`. Пока вы вводите команду, диалог выводит список приложений или действий подходящих под ваш ввод. Выберите нужный пункт или нажмите **[ ]**, чтобы запустить выделенное приложение или действие. Введенная команда запустит приложение, часто (но не всегда) команда это просто имя приложения, написанное строчными буквами.



Диалог Запуск команд предоставляет простой доступ к различным возможностям. Нажмите на значек с вопросом, чтобы увидеть список активных функций. Для настройки или получения списка всех функций нажмите на значек гаечного ключа. Также можно использовать так называемые Веб-сокращения заданные в Konqueror для отправки поисковых запросов напрямую к поисковому серверу без предварительного открытия браузера. Другой интересной функцией является калькулятор поддерживающий математические выражения, такие как  $=2+2^4-\sin(2)$ . Очень удобно конвертировать различные величины, например, перевести скорость из миль в час в километры в час. Просто вставьте выражение `60 mph in km/h` для получения результата.

### 2.2.3 Поиск приложений

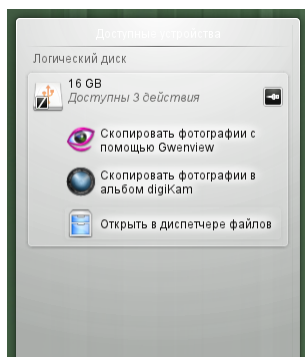
Главное меню и диалог Выполнить команду предлагают функцию поиска, которая позволяет быстро запускать программы, даже если вы уже не знаете точное имя приложения или команду для его запуска. Чтобы найти приложение, начните набирать команду или часть имени приложения в поле Поиск: Главного меню или введите в поле диалога Выполнить команду. Каждый введенный символ сужает поиск.

В списке расположенном ниже поля ввода выберите нужное приложение.

## 2.3 Управление внешними устройствами

Если вставить CD или DVD в привод или подключите внешнее устройство (например, USB-брелок или переносной жесткий диск), то виджет оповещения о новых устройствах откроется маленьким окошком со списком подключенных устройств.

В этом окне также выводятся возможные действия, в зависимости от типа устройства.



Так, например, если подключить цифровую камеру, то будет предложено загрузить фотографии с помощью Gwenview или digiKam. Нажмите на пункт с именем устройства, чтобы получить список доступных действий. Чтобы безопасно отключить устройство от компьютера воспользуйтесь значком в правой части строки с именем устройства.

## 2.4 Придание индивидуальности рабочему столу

можно изменить внешний вид и поведение рабочего стола KDE в соответствии с вашими предпочтениями.

### 2.4.1 Блокировка и разблокировка элементов рабочего стола

Элементы рабочего стола могут быть заблокированы в их текущих позициях, чтобы воспрепятствовать их перемещению на рабочем столе. Пока элементы рабочего стола заблокированы нельзя добавлять, перемещать или удалять их.

Чтобы заблокировать или разблокировать элементы рабочего стола, нажмите на значок кешью (кнопка инструментов Plasma) в верхнем правом углу рабочего стола и выберите Заблокировать изменение виджетов или Разблокировать изменение виджетов, соответственно.

Или нажмите правой кнопкой мыши на пустом месте рабочего стола и выберите Заблокировать изменение виджетов или Разблокировать изменение виджетов.

## 2.4.2 Изменение индивидуальных элементов рабочего стола

Далее можно найти некоторые примеры, как изменить индивидуальные элементы рабочего стола.

### Процедура 2.1 Добавление значка программы на рабочий стол

Чтобы создать ярлык для приложения и поместить его на рабочий стол или панель, воспользуйтесь следующей инструкцией:

- 1 Нажмите кнопку Главное меню и найдите там нужное приложение.
- 2 Нажмите правой кнопкой мыши и выберите Добавить на рабочий стол в появившемся контекстном меню. Если этот пункт меню недоступен, вероятно изменение элементов рабочего стола заблокировано. Снимите блокировку как описано в [Раздел 2.4.1, «Блокировка и разблокировка элементов рабочего стола»](#) (стр. 15).
- 3 Чтобы изменить положение значка на рабочем столе, нажмите левой кнопкой мыши на значке и перетащите его на нужное место.

Чтобы удалить значок с рабочего стола, нажмите правой кнопкой мыши на значке программы и выберите Удалить виджет "Значок".

### Процедура 2.2 Добавление виджетов на рабочий стол

- 1 Чтобы добавить виджеты на рабочий стол, нажмите правой кнопкой мыши на пустом месте рабочего стола и выберите Добавить виджеты....

Чтобы добавить виджет на панель нажмите правой кнопкой мыши на пустом месте панели и выберите Настроить виджет "Панель" > Добавить виджеты....

Если такой пункт в меню недоступен, вероятно изменение элементов Вашего рабочего стола заблокировано. В этом случае нажмите правой кнопкой мыши и выберите Разблокировать изменение виджетов.

- 2 В появившемся списке выберите нужный виджет. Используйте прокрутку для исследования доступных виджетов. Чтобы ограничить число отображаемых виджетов, введите в поле термин для поиска или выберите категорию.
- 3 Чтобы поместить выбранный виджет на рабочий стол или на панель, дважды нажмите левой кнопкой мышки по нему и закройте диалог.
- 4 Чтобы удалить виджет с рабочего стола, нажмите правой кнопкой мыши на виджете и выберите пункт Удалить виджет....

### Процедура 2.3 Настройка виджетов рабочего стола

- 1 Поместите указатель мыши над виджетом — появится прозрачная область рядом с виджетом, в которой будут находиться несколько символов:





Если эта область не появилась, вероятнее всего изменение виджетов заблокировано. Сначала разблокируйте их, как написано в [Раздел 2.4.1, «Блокировка и разблокировка элементов рабочего стола»](#) (стр. 15).

- 2 Чтобы изменить размер виджета нажмите левой кнопкой мыши на символ масштабирования в прозрачной области и, не отпуская кнопку мыши, медленно переместите курсор вдоль рабочего стола.
- 3 Чтобы повернуть виджет в любом направлении нажмите левой кнопкой мыши на символ круговой стрелки в прозрачной области и, удерживая кнопку мыши нажатой, переместите курсор описывая окружность. Есть «липкая» граница в горизонтальной и вертикальной позиции, где можно зафиксировать виджет. Конечно, можно расположить виджет под любым углом.
- 4 Чтобы изменить содержимое, параметры или свойства виджета, нажмите левой кнопкой мыши на символ гаечного ключа в прозрачной области. В появившемся диалоговом окне произведите необходимые настройки, согласно вашим предпочтениям.

#### Процедура 2.4 Добавление и удаление панелей

- 1 Если нужно разместить несколько панелей на рабочем столе, то нажмите правой кнопкой мыши на пустом месте рабочего стола и выберите Добавить панель, затем выберите тип панели из списка.

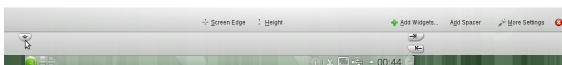
Если этот пункт меню недоступен, значит элементы рабочего стола заблокированы. В этом случае, нажмите правой кнопкой мыши и выберите Разблокировать изменение виджетов.

- 2 Нажмите на значок кешью с правой стороны новой панели, чтобы получить доступ к опциям настройки панели как описано в [Процедура 2.5, «Настройка панелей»](#) (стр. 18).
- 3 Чтобы удалить панель нажмите правой кнопкой мыши на пустом пространстве панели которую нужно удалить и выберите Настроить виджет "Панель" > Удалить виджет "Панель". требует, чтобы по крайней мере одна панель оставалась на рабочем столе.

## Процедура 2.5 Настройка панелей

можно настроить панель KDE в соответствии с вашими предпочтениями. Приложения и виджеты могут быть добавлены в область быстрого запуска или системный лоток на главной панели, или в дополнительной панели. Элементы панели и дополнительные панели можно свободно перемещать или полностью удалить в любое время.

- 1 Чтобы получить доступ к опциям текущей панели нажмите правой кнопкой мыши на пустом месте панели (или нажмите на значок кешью с правой стороны панели) и выберите Настроить виджет "Панель" > Настроить панель. Здесь можно изменить внешний вид и расположение панели.



Если такой пункт в меню и значок недоступны, вероятно изменение элементов Вашего рабочего стола заблокировано. В этом случае нажмите правой кнопкой мыши и выберите Разблокировать изменение виджетов.

- 2 Чтобы переместить элемент панели в другое место поместите курсор мыши над соответствующим элементом (например, значком программы, переключателем рабочих столов, системным лоток). Под курсором мыши появится перекрестие. Нажмите на него и переместите курсор в нужную позицию на панели. Нажмите еще раз, чтобы зафиксировать это положение.
- 3 Чтобы увеличить расстояние между двумя виджетами, воспользуйтесь кнопкой Добавить разделитель. Виджет разделитель появится с правой стороны. Перетащите его в нужное место.
- 4 Чтобы изменить ширину панели, нажмите и потяните за маленький значок стрелки с левого или правого конца панели. Используйте стрелку с левой стороны, чтобы задать положение панели, стрелки с правой стороны для задания максимального и минимального размеров панелей.
- 5 Чтобы изменить высоту панели, нажмите на кнопку Высота и переместите курсор до нужного положения.
- 6 Чтобы поместить панель с другой стороны экрана, воспользуйтесь кнопкой Край экрана. Потяните за нее и отпустите в нужном месте.
- 7 Если нужно добавить виджеты на панель, то сделайте это с помощью кнопки Добавить виджеты.... [Процедура 2.2, «Добавление виджетов на рабочий стол»](#) (стр. 16).
- 8 Чтобы удалить значки приложений или виджет с панели нажмите правой кнопкой мыши на нужном элементе и выберите пункт меню для удаления этого элемента.

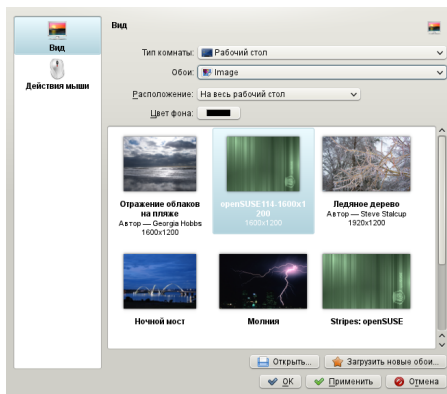
Значки в системном лотке обычно относятся к запущенным в фоне приложениям. Поэтому можно удалить эти значки только, если закроете эти приложения (нажмите правой кнопкой мыши по значку и выберите Выход).

- 9 Чтобы воспрепятствовать случайному перемещению панели и виджетов, используйте кнопку Заблокировать изменение виджетов.
- 10 Для установки дополнительных настроек (как автоскрытие панели) и положения панели используйте кнопку Дополнительно.
- 11 Если все изменения панели соответствуют вашим пожеланиями, то закройте панель настройки с помощью красной кнопки расположенной с правой стороны.

## Процедура 2.6 Изменение фона рабочего стола

можно изменить фон рабочего стола на изображение, слайдшоу, мозаику или просто залить однотонным цветом. Так же присутствует возможность установить в качестве фона карту земного шара или прогноз погоды.

- 1 Нажмите правой кнопкой мыши на пустом месте рабочего стола и выберите Настроить виджет "Рабочий стол". Откроется диалоговое окно настроек.
- 2 В секции Вид выберите требуемый тип в выпадающем списке Обои. Затем установите дополнительные параметры для выбранного объекта, который будет использован в качестве фона рабочего стола.
- 3 Например, чтобы установить изображение в качестве обоев:
  - 3а Выберите Изображение в списке Обои.
  - 3б Задайте Расположение для изображения.
  - 3с Чтобы выбрать уже имеющиеся обои выберите их в списке ниже или нажмите Загрузить новые обои..., чтобы загрузить и установить новые обои.
  - 3д Чтобы выбрать другое изображение нажмите Открыть... и выберите нужное в файловой системе.



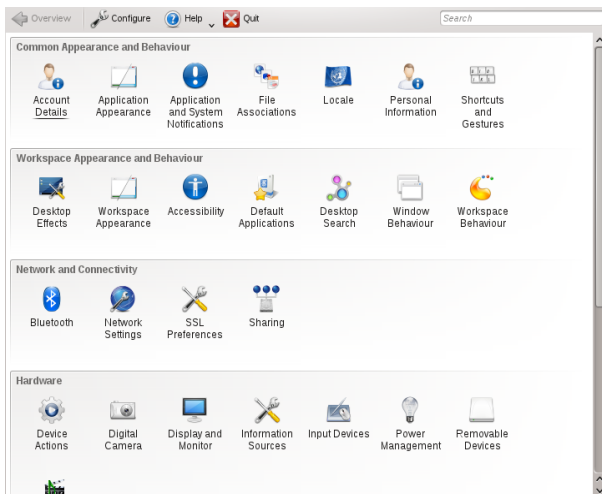
- 4 Установите другие настройки в диалоговом окне в соответствии с вашими предпочтениями и нажмите ОК, чтобы сохранить изменения и закрыть это окно.

### 2.4.3 Изменение персональных настроек

Наряду с изменением отдельных элементов рабочего стола, KDE позволяет в достаточно высокой степени придать индивидуальности вашему рабочему столу. Настройки общего вида и поведения приложений можно найти в диалоге конфигурации Параметры системы.

Запустите Параметры системы выбрав в Главное меню в секции Избранное > Параметры системы.

Настройки сгруппированы по категориями. Наведите курсор на значок, чтобы увидеть детали. Выполнение некоторых действий над персональными настройками требует наличия прав системного администратора (root).



Измените нужные параметры. Изменения не вступят в силу пока вы не нажмете Применить. Чтобы сбросить еще не примененные настройки нажмите Сбросить. Чтобы сбросить значения для всех пунктов на значения по умолчанию, нажмите По умолчанию.

Чтобы вернуться назад к основному виду (отображаются все категории), нажмите Назад в верхнем левом углу окна. Вы так же можете найти нужную категорию введя название одного из ее элементов в поисковое поле в верхней части окна (например, Хранитель экрана). Каждый введенный символ в строке Поиск улучшает точность поиска.

Для более удобного представления всех категорий, можно переключиться на их вывод в виде дерева, нажав Настроить и выбрав другой Вид меню.

## 2.5 Применение эффектов рабочего стола

Если компьютер оснащен видео картой поддерживающей ускорение 3D-графики и Xgl, то можно использовать такие графические эффекты как превращение рабочего стола во вращаемый трехмерный куб, прозрачные элементы рабочего стола или прозрачные окна, экранная лупа и так далее. Вы так же можете использовать другие эффекты как тени, затухание и колыхание окон. Если нет совместимой видео карты, некоторые эффекты могут быть заблокированы или негативно сказаться на производительности системы. Если производительность компьютера очень маленькая - отключите композитные эффекты для текущей сессии с помощью [] + [] + [F12].

Чтобы настроить эффекты рабочего стола, сделайте следующее:

- 1 Запустите Параметры системы как описано в **Раздел 2.4.3, «Изменение персональных настроек»** (стр. 20).
- 2 Выберите Эффекты рабочего стола в категории Внешний вид и поведение рабочего стола и отметьте Включить графические эффекты. Если видео карта не поддерживает ускорение 3D графики, то будет выдано соответствующее уведомление.
- 3 Дополнительно, можно изменить некоторые настройки в секции Основные параметры.
- 4 На вкладке Эффекты выберите необходимые вам эффекты. Нажмите на значок с буквой i, чтобы получить краткое описание для соответствующего эффекта. Если эффект активирован, то значок с гаечным ключом предоставит доступ к таким настройкам, например как, сочетания клавиш.
- 5 Воспользуйтесь кнопкой Применить, чтобы немедленно активировать выбранные эффекты.

## 2.6 Использование виртуальных рабочих столов

Среда рабочего стола предоставляет возможность размещать программы и задачи на нескольких виртуальных рабочих столах. Если вы часто работаете с множеством запущенных программ, то данная функция позволит сократить число окон выводимых на экран. Вы могли бы, например, использовать один рабочий стол для работы с электронной почтой и календарем, а другой для правки текстов и обработки изображений.

### Процедура 2.7 Перемещение приложения на другой виртуальный рабочий стол

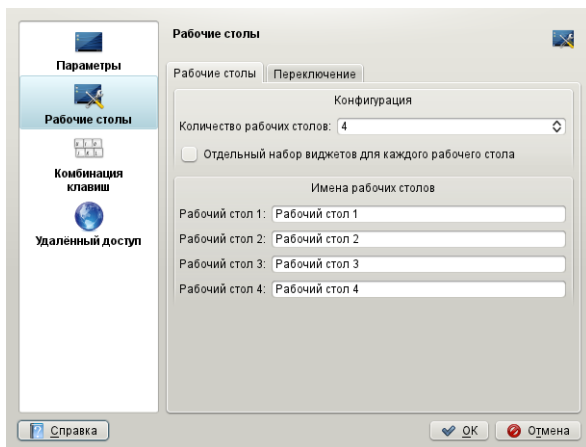
можно отобразить запущенные приложения с текущего или со всех виртуальных рабочих столов, или перемещать их на другие рабочие столы.

- 1 Запустите любое приложение.
- 2 Нажмите правой кнопкой мыши на заголовке окна.
- 3 Нажмите На рабочий стол.
- 4 Выберите рабочий стол на который нужно переместить приложение.
- 5 Чтобы переключиться на другой рабочий стол выберите нужный в виджете Переключение рабочих столов. Переключаться на следующий или предыдущий рабочий стол можно с помощью колеса мыши, поместив курсор над пустым пространством рабочего стола.

## Процедура 2.8 Конфигурирование виртуальных рабочих столов

можно увеличить число виртуальных рабочих столов, изменить присвоенные им по умолчанию названия, назначить комнаты, настроить эффекты анимации или назначить сочетания клавиш для их переключения.

- 1 Чтобы добавить еще один рабочий стол нажмите правой кнопкой мыши на пейджере и выберите Добавить виртуальный рабочий стол. Новый рабочий стол появится в этом виджете.
- 2 Для получения доступа к настройкам нажмите правой кнопкой мыши на пейджере и выберите Настроить виджет "Переключение рабочих столов".



- 3 Используйте настройки в секции Параметры для задания внешнего вида и поведения виджета.
- 4 Названия рабочих столов, сочетания клавиш и анимация переключения между виртуальными рабочими столами могут быть настроены в секции Рабочие столы.
- 5 Установите настройки в соответствии с вашими предпочтениями и нажмите OK, чтобы применить сделанные изменения и закрыть это диалоговое окно.

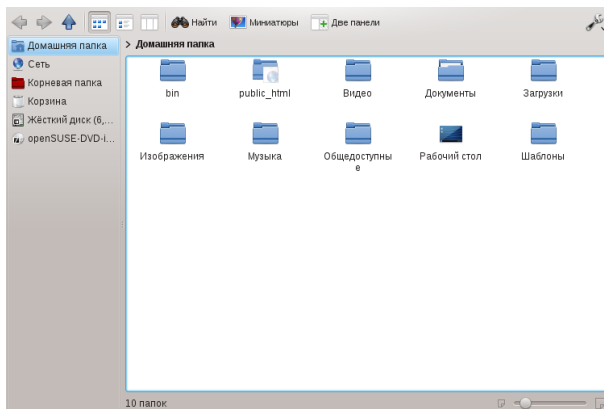
## 2.7 Управление файлами и каталогами

В KDE 4, Dolphin заменил Konqueror в качестве программы по умолчанию для работы с файлами. Konqueror остался веб-браузером (смотрите [Раздел 2.8, «Путешествие в сети Интернет»](#) (стр. 27)). Чтобы запустить Dolphin выберите в

главном меню Избранное > Менеджер файлов или нажмите [] + [F2] и введите dolphin.

## 2.7.1 Dolphin, основное окно

Основное окно Dolphin состоит из следующих элементов:



**Строка меню:** Строка меню содержит элементы для таких действий как: копирование, перемещение и удаление файлов, изменение режима представления, запуск дополнительных инструментов, различных настроек и получения помощи.

**Панель инструментов:** Панель инструментов обеспечивает быстрый доступ к часто используемым функциям, которые также доступны через меню. Если подвести курсор мыши к значку, то появится краткое описание во всплывающей подсказке.

**Строка адреса:** Строка адреса отображает путь к текущему открытому каталогу. Она может быть представлена в двух версиях: путь до текущего каталога отображается значками для каждой встречающейся папки в виде «хлебных крошек». Нажмите на любой значок в строке адреса, чтобы перейти в этот каталог. Вторая версия показывает путь до текущего каталога в виде текстовой строки, которую можно редактировать.

**Панели:** По умолчанию, Dolphin отображает только панель Точки входа. Она предоставляет быстрый доступ к часто используемым местам, например как, ваш домашний каталог, корневой каталог (/), корзина и внешние носители. Есть и другие панели, которые можно добавить в основное окно нажав Вид > Панели.

**Область отображения (рабочее пространство):** В области отображения выводится содержимое выбранного каталога или файла. По умолчанию, при запуске Dolphin отображает содержимое вашего домашнего каталога. Нажатие на папку



или файл в Dolphin приведет к следующему: он загрузит файл в приложение для дальнейшей обработки или отобразит содержимое этой папки.

Строка состояния: Отображает тип и размер выделенного объекта, позволяет увеличить или уменьшить размер значков или записей, отображаемых в рабочем пространстве.

## 2.7.2 Управление файлами и папками в Dolphin

Чтобы выполнить такие действия как копирование, перемещение, создание или удаление файлов нужно обладать соответствующими правами доступа для этих каталогов и файлов.

Для копирования, перемещения или удаления файла или каталога, проделайте следующее:

- 1 Чтобы выбрать в Dolphin один или несколько файлов или каталогов переместите указатель мыши к значку, но не нажимайте на него. Появится зеленый значок плюса в верхнем левом углу. Если нажать на него, то этот элемент будет выделен. Чтобы снять выделение нажмите на красный значок минуса наведя курсор на выделенный объект.

Другим способом можно выделить или снять выделение у нужных объектов зажав **Ctrl** при выделении элементов мышью.

- 2 Нажмите правой кнопкой мыши и выберите Копировать или Вырезать в появившемся контекстном меню.
- 3 Перейдите в в нужный каталог и вставьте туда выбранные элементы.
- 4 Чтобы создать новую папку в текущем каталоге, выберите Файл > Создать > Папку или нажмите **[F10]**. Укажите имя для нового каталога в появившемся окне и нажмите **[Enter]**.
- 5 Чтобы вставить скопированные или вырезанные объекты на шаге **Шаг 2** (стр. 25) нажмите правой кнопкой мыши находясь в каталоге, в который вы хотите вставить объекты и выберите Вставить. Выбранные объекты будут скопированы или перемещены в эту папку.
- 6 Чтобы удалить файл или папку, нажмите правой кнопкой мыши на удаляемом объекте и выберите Удалить в корзину в появившемся контекстном меню. Выбранный объект будет перемещен в корзину. В ней Вы сможете восстановить удаленный по ошибке объект или окончательно удалить его без возможности восстановления.

Чтобы быстро отфильтровать файлы в текущем каталоге по имени, нажмите **[Ctrl] + [F]** — появится поле ввода Фильтр в низу основного окна Dolphin. Введите любую часть имени файла, который вы ищете, чтобы отобразились все файлы в текущем каталоге, в имени которых присутствует заданная строка. Для более детального и расширенного поиска, нажмите **[Ctrl] + [F]**, чтобы запустить утилиту KFind.

Для получения дополнительной информации, обратитесь к [Раздел 2.14.2, «Использование локального поиска Strigi»](#) (стр. 37).

## 2.7.3 Настройка Dolphin

Dolphin предлагает много опций для изменения представления данных о файлах и всех других параметров в соответствии с вашими предпочтениям.

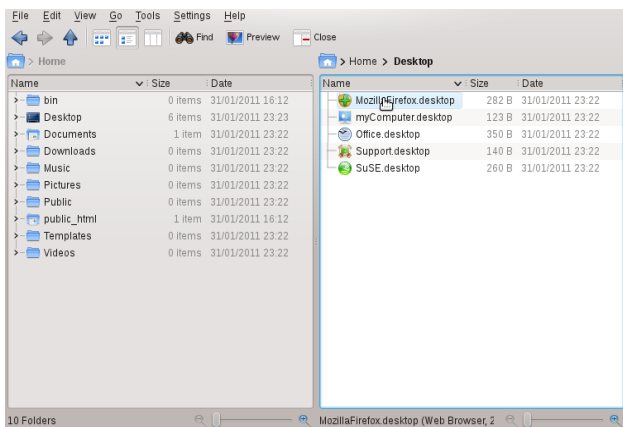
### Процедура 2.9 Смена представления

- 1 Чтобы переключить адресную строку из вида хлебных крошек к редактируемой версии, нажмите [F6] или нажмите на фон хлебных крошек. Введите путь до нужного каталога. После ввода адреса нажмите [Enter].

Чтобы очистить содержимое адресной строки нажмите на черный символ X справа. Чтобы переключиться обратно к виду хлебных крошек нажмите [F6] + [L].



- 2 Чтобы изменить представление текущей папки нажмите на панели инструментов на Значки, Таблица или Столбцы. Dolphin запомнит выбранный вид для текущей папки. Нажмите Две панели или [F3], чтобы представить содержимое текущей папки в двух разделенных столбцах. Теперь можно перемещаться по каталогам в каждом столбце и легко перетаскивать объекты из одного столбца в другой или сравнивать содержимое каталогов. Нажмите еще раз [F3], чтобы убрать дополнительный столбец.



- 3 Чтобы указать Dolphin отображать также и скрытые файлы, выберите Вид > Показывать скрытые файлы.

- 4 Чтобы выводить больше информации о файлах (как права доступа или владельца) в рабочем пространстве окна, выберите Вид > Дополнительные сведения и отметьте нужные опции.
- 5 Чтобы добавить нужные каталоги на панель Точки входа, перетащите папку из рабочей области на эту панель. Нажмите правой кнопкой мыши и воспользуйтесь контекстным меню, чтобы скрыть, отредактировать или удалить элементы панели Точки входа.
- 6 Чтобы добавить другие панели в главное окно, выберите Вид > Панели и выберите такие дополнительные панели как Сведения, Папки или Терминал.

Открепить панели от главного окна Dolphin можно нажав на левый значок в заголовке каждой панели. Нажмите на заголовок панели и потяните ее в любое другое место на рабочем столе. Чтобы вернуть панель обратно в окно Dolphin, снова нажмите на левый символ в заголовке панели.

#### Процедура 2.10 Полное изменение настроек Dolphin

Если нужно полностью изменить поведение Dolphin или его внешний вид, выберите Настройка > Настроить Dolphin... и изучите опции, предлагаемые в диалоге настройки Dolphin.

- 1 Чтобы использовать один режим представления для всех папок, нажмите Главное в левом столбце. Выберите Одинаковые для всех папок на вкладке Представление. Измените опции режимов представления согласно вашим предпочтениям на других вкладках и нажмите Применить, чтобы сохранить изменения.
- 2 Если нужно, чтобы Dolphin отображал другой каталог при запуске или, если вы хотите всегда использовать строку адреса в текстовом формате вместо хлебных крошек, то измените соответствующие опции выбрав слева Начальное представление.
- 3 Чтобы настроить пункты и действия отображаемые в контекстном меню Dolphin нажмите Главное. На вкладке Контекстное меню активируйте необходимые пункты. Нажмите Действия в левой панели и включите или отключите соответствующие действия для контекстного меню.
- 4 Нажмите ОК, чтобы сохранить изменения и закрыть диалог настройки Dolphin.

## 2.8 Путешествие в сети Интернет

Кроме Konqueror (веб-браузер по умолчанию в KDE), также включает браузер Firefox. Чтобы запустить Konqueror или Firefox нажмите  $\square$  + [F2] и введите, соответственно, `konqueror` или `firefox`.

В купе с такими функциями как поддержка вкладок, блокирование всплывающей рекламы и менеджер загрузок, оба браузера сочетают в себе последние дости-

жения в веб-технологиях. Их свободный подход к использованию поисковых механизмов помогает находить информацию, в которой вы нуждаетесь.



Введите URL в адресной строке, чтобы перейти по этой ссылке. Чтобы открыть новую пустую вкладку нажмите **[ ] + [T]**. Чтобы открыть ссылку в новой вкладке нажмите на ней средней кнопкой. Нажмите правой кнопкой мыши на вкладке, чтобы обратиться к большому количеству опций доступных для вкладок. можно создать новую вкладку, перезагрузить или закрыть одну или все открытые вкладки. можно также изменить расположение вкладок перетаскивая их в нужное положение.

## 2.8.1 Поиск информации

Оба браузера предлагают различные параметры поиска: можно искать информацию в Интернет или по ключевому слову в тексте открытой страницы.

### Процедура 2.11 Поиск в Интернет

- 1 Чтобы запустить поиск в Интернет нажмите на значок в левой части поисковой строки, для открытия списка доступных поисковых ресурсов.
- 2 Выберите желаемый поисковый ресурс и введите поисковый запрос в текстовое поле.
- 3 Нажмите **[ ]**, чтобы запустить поиск.
- 4 Чтобы найти искомое слово на открой странице в Firefox или Konqueror нажмите **[ ] + [F]**, чтобы открыть панель поиска в нижней части окна. Введите здесь слово которое необходимо найти и используйте кнопки на панели, чтобы искать в разных направлениях или установить настройки поиска, например как, С учетом регистра.

Konqueror предлагает пользователям сокращения для быстро поиска в Интернет. Например, чтобы запустить поиск для слова `yast` используя Google, просто вве-

дите `gg: yast` в адресной строке браузера (или диалоге Выполнить команду) и нажимите [].

можно задать собственные сокращения в Konqueror и Firefox как описано в [Раздел 2.8.3, «Задание персональных настроек»](#) (стр. 29).

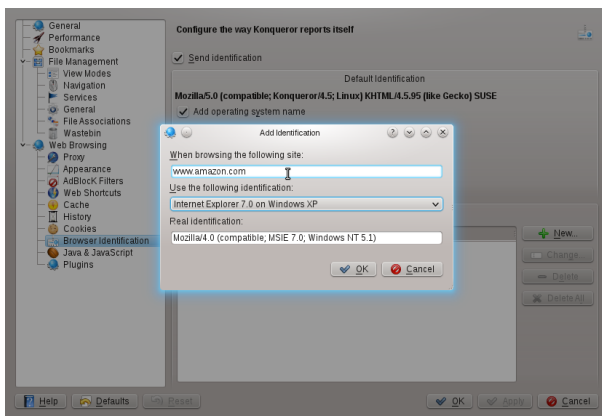
## 2.8.2 Загрузка файлов из сети

Если вы попытаетесь загрузить файл в Firefox или Konqueror, то увидите диалоговое окно запрашивающее разрешение на сохранение или открытие файла в программе связанной с этим типом файлов. Так же можно указать применять выбранное действие ко всем файлам данного типа. По умолчанию, Firefox сохраняет файлы в папку заданную в Настройках Firefox и показывает завершенные загрузки в диалоговом окне загрузки.

Чтобы открыть загруженные файлы, нажмите правой кнопкой мыши и выберите Открыть. Чтобы очистить историю загрузок, нажмите правой кнопкой мыши и выберите Очистить список.

## 2.8.3 Задание персональных настроек

Установите желаемое поведение Konqueror или Firefox. В Konqueror, получить доступ к диалогу настроек можно в Настройка > Настроить Konqueror.... Чтобы изменить поведение Konqueror как Веб-браузера, выберите категорию Веб-браузер в левой панели, чтобы отобразить опции для соответствующей категории. Например, можно «спрятать» реальный идентификатор Konqueror и задать для него значение для другого браузера (например, Internet Explorer\*) определенных сайтов. Для этого выберите Версия браузера и нажмите Добавить, чтобы добавить идентификацию для нужного домена.



можно задать сетевые сокращения, которые используете в Konqueror (или в диалоге Выполнить команду). В диалоге настройки Konqueror нажмите Сокращения,

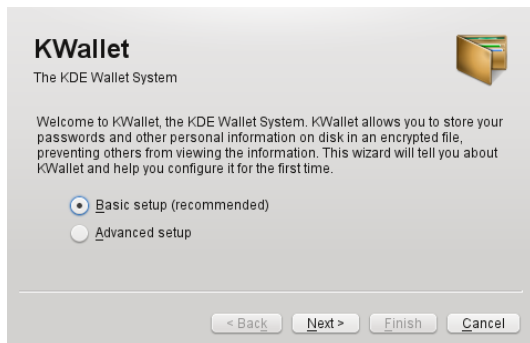
чтобы увидеть какие сокращения уже определены. Нажмите **Добавить**, чтобы задать новое сокращение. Закройте диалог настройки Konqueror нажатием на **OK**, чтобы сохранить изменения.

В Firefox, выберите **Правка > Настройки**, чтобы открыть Настройки Firefox. Нажмите на значок в верхней части экрана, чтобы получить доступ к настройкам в соответствующей нужной категории. Например, измените папку загрузок по умолчанию на вкладке **Основные** или скорректируйте правила блокирования всплывающих окон на странице **Содержимое**. Нажмите **Заккрыть**, чтобы сохранить сделанные изменения.

Чтобы настроить веб-сокращение для быстрого поиска в Firefox перейдите на страницу с нужным поисковым полем. Нажмите правой кнопкой мыши на этом поле и выберите **Добавить краткое имя для данного поиска....** Укажите Краткое имя и покиньте этот диалог нажав на **Сохранить**.

## 2.9 Управление паролями

При первом вводе пароля в приложении KDE (например, в KMail или Konqueror), будет задан предложено сохранить пароль в зашифрованном бумажнике. Если нажать **Да**, то по умолчанию запустится мастер KWallet. KWallet — это приложение для управления паролями, в котором можно хранить все свои пароли в надежно зашифрованных файлах (бумажниках).



Для активации KWallet выберите **Стандартная настройка** и нажмите **Далее**. Выберите **Да**, я хочу использовать бумажник KDE для хранения личной информации и введите пароль. Это ваш мастер-пароль для получения доступа к бумажнику (с названием `kdewallet`), который будет создан на следующем шаге.

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### ПРЕДУПРЕЖДЕНИЕ: Защита паролей в KWallet

Если вы забудете мастер-пароль для какого-либо бумажника, то его будет невозможно восстановить. Кроме того, любой, кто знает ваш мастер-пароль может получить доступ ко всей информации содержащейся в этом бумажнике.

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Нажмите Завершить, чтобы завершить настройку. Если Вы запустите мастер KWallet из другого приложения как, например, Konqueror или KMail, то KWallet запросит мастер-пароль для бумажника, чтобы сохранить в нем пароль для этого приложения. После создания конфигурации можно открыть бумажник в любое время для просмотра, поиска, удаления или создания записей. Обычно добавлять записи вручную не нужно. KDE самостоятельно распознает когда ресурсу необходима авторизация и автоматически запустит KWallet, при этом будет запрошен мастер-пароль. Тем не менее, можно добавить дополнительные данные, если это необходимо. Для на настройки каких-либо параметров KWallet нажмите `[] + [F2]` и введите `kwalletmanager`. В открывшейся программе управления бумажниками KDE выберите Настройка > Настроить KWallet....

Не смотря на то, что KWallet создавался как основная программа для управления паролями KDE приложений, Firefox так же может хранить данные которые вводятся в поля имени пользователя и пароля на Веб-сайтах. Если подтвердить свое согласие на сохранение этих данных нажатием на кнопку Запомнить, то пароль будет сохранен на жестком диске в зашифрованном формате. В следующий раз при посещении этого сайт Firefox автоматически заполнит поля имени пользователя и пароля.

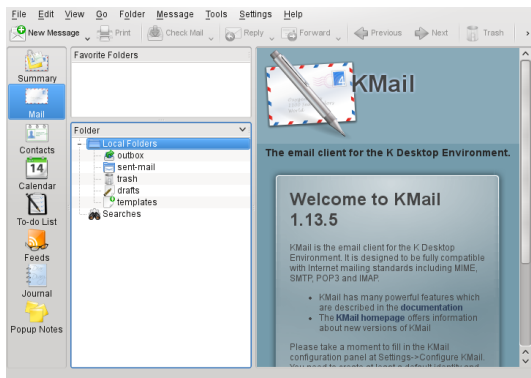
Чтобы просмотреть или изменить пароли сохраненные в Firefox выберите Правка Настройки.

## 2.10 Электронная почта и календарь

Для чтения и управления почтой, можно воспользоваться программой Kontact, выступающей в качестве персонального информационного менеджера (Personal Information Manager, PIM). Kontact объединяет в едином интерфейсе такие приложения из состава KDE как KMail, KOrganizer и KAddressBook. Это позволяет легко получить доступ к почте, календарю, адресной книге и другим функциям PIM. Kontact так же поддерживает работу сразу с несколькими учётными записями электронной почты.

### 2.10.1 Первый запуск Kontact

Чтобы запустить Kontact нажмите `[] + [F2]` и введите `kontact`. Чтобы доступ к одному из его компонентов, как, например, KMail нажмите на соответствующий значок в левой боковой панели.



Перед отправкой или получением почты необходимо настроить учётную запись:

- 1 В меню выберите Настройка > Настроить Контакт....
- 2 В левой боковой панели под Почта нажмите на Профили и выберите профиль автоматически созданный KMail. Нажав Изменить... можно указать Ваше полное имя и адрес электронной почты, внести другие изменения.
- 3 Нажмите Учётные записи в левой боковой панели под Почта и Добавить..., чтобы добавить по крайней мере по одной учётной записи на вкладках Получение и Отправка. (можно настроить одновременное использование нескольких учётных записей).

Обычно, требуется следующая информация для обеих учётных записей — для входящей и отправляемой почты: тип учётной записи, адрес сервера и порт. В зависимости от учётной записи, так же понадобится указать опции шифрования или авторизации. Если вы не уверены, что знаете какие настройки нужно указать — обратитесь за консультацией к вашему Интернет-провайдеру или системному администратору.

- 4 Проверьте установки и покиньте диалог настройки нажав ОК.

Чтобы написать письмо нажмите на значок Почта в главном окне Контакт и нажмите **[ ] + [N]**. После завершения написания письма нажмите Отправить, чтобы немедленно его отправить. В случае использования нескольких учётных записей нажмите удерживайте кнопку Отправить нажатой, чтобы выбрать учётную запись с помощью которой нужно отправить это письмо.

## 2.11 Обмен мгновенными сообщениями в Kopete

Kopete — приложение для обмена сообщениями в сети Интернет, позволяющее работать сразу с несколькими протоколами. Kopete в настоящее время поддер-



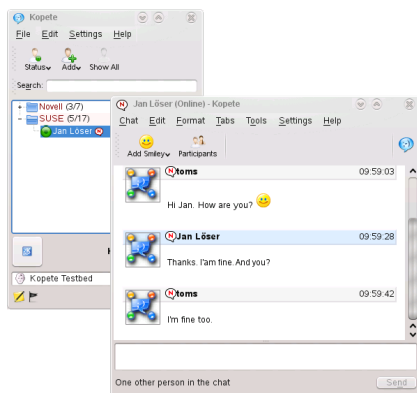
живает все популярные протоколы общения, такие как AOL\* Instant Messenger (AIM), Gadu-Gadu, GroupWise® Messenger, ICQ, Jabber\*, MSN, SMS и Yahoo!\*. Чтобы воспользоваться службой мгновенного обмена сообщениями (IM), нужно сначала зарегистрироваться у провайдера предлагающего данную службу IM, и настроить учётную запись в Kopete.

Чтобы запустить Kopete нажмите **[ ] + [F2]** и введите `kopete`. Если программа запущена первый раз — нажмите на значок гаечного ключа в нижней части окна Kopete, чтобы создать учётную запись. Kopete проведет вас через несколько шагов как выбор службы обмена сообщениями, ввод соответствующей информации об учётной записи — имя пользователя или ID, имя сервера и порт и другие данные необходимые для авторизации. Если Вы еще не зарегистрированы в выбранной службе обмена сообщениями, то нажмите Зарегистрировать новую учётную запись. В открывшемся окне браузера введите данные необходимые для регистрации. Переключитесь обратно в Kopete и введите данные полученные при регистрации. Для завершения настройки учётной записи нажмите Завершить.

Если нужно выйти в сеть после конфигурирования своей учётной записи, то можно добавить контакты в основном окне Kopete. Если в окне Kopete отображается статус **не в сети**, сперва нажмите **Файл > Установить статус > В сети** и введите пароль, если он будет запрошен. После подключения нажмите **Файл > Добавить контакт** и выберите учётную запись Kopete для которой нужно добавить контакты. Введите данные контакта или найдите его и нажмите **OK**.

Чтобы видеть все свои контакты, даже если некоторые из них не в сети, выберите **Настройка > Показывать пользователей не в сети**.

Чтобы начать с кем-нибудь разговор, нажмите на нужном контакте и введите сообщение в нижней части открывшегося окна. Нажмите **[ ]** для отправки сообщения. В верхней части окна будет отображаться ваша переписка.



## 2.12 Запуск LibreOffice

Набор офисных приложений LibreOffice включает все необходимое для работы: текстовый процессор, редактор электронных таблиц, мастер презентаций, редактор векторной графики и компоненты для работы с базами данных. Так как LibreOffice доступен для большого числа систем — можно работать с теми же данными на различных компьютерных платформах.

Чтобы запустить LibreOffice нажмите `[ ] + [F2]` и введите `libreoffice`. Чтобы создать новый документ выберите `Файл > Создать` и выберите тип создаваемого документа. Чтобы открыть существующий документ выберите `Открыть` и укажите соответствующий файл в файловой системе.

Дополнительная информация находится в LibreOffice Быстрый старт.

## 2.13 Просмотр PDF-файлов и других документов

Документы, которые должны быть доступны для распространения или печати на многих платформах, могут быть сохранены в формате PDF (Portable Document Format), например, при помощи LibreOffice. Просмотреть их можно с помощью Okular — программа по умолчанию для просмотра документов в KDE.

### 2.13.1 Использование Okular

Кроме файлов формата PDF Okular позволяет просматривать большое число других форматов, таких как PostScript, несколько форматов изображений, формат OpenDocument (ODF), OpenDocument Text (ODT), некоторые форматы eBook (ePub), и даже Microsoft\* Compiled HTML Help (CHM). Также Okular поддерживает работу с закладками, аннотациями, метаданным и мультимедийным содержанием, а также поворот страниц.

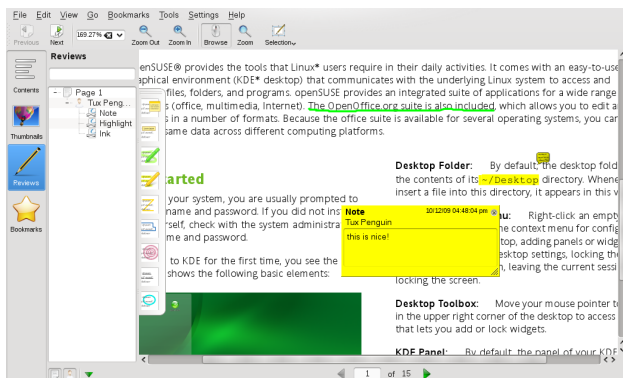
Запустить Okular можно из Главного меню или нажав `[ ] + [F2]` и введя `okular`.

Чтобы открыть документ, выберите `Файл > Открыть` и укажите нужный файл в файловой системе. Перемещение по документу, осуществляется с помощью значков навигации в верхней или нижней части окна. В зависимости от значка на который вы нажмете, расположенных в левой части окна, в боковой панели отобразится колонка с Содержанием, Миниатюрами для каждой страницы, Рецензирование или Закладки для этого документа. Чтобы найти любой текст среди перечисленных в боковой панели миниатюр или во всем документе, просто введите искомую строку в поле вверху боковой панели. Если нужно выделить и скопировать текст или изображение из открытого в Okular файла, то нажмите на значок Выделение области на панели инструментов и выберите нужную функцию в контекстном меню. Нажмите на значок Перетаскивание, чтобы переключиться обратно в режим просмотра документа.

## Процедура 2.12 Работа с закладками и аннотациями

С Okular можно рецензировать документ, подсвечивая части текста, или добавлять примечания или закладки, которые Okular затем прикрепит к файлу в виде метаданных. Заметьте, что добавленные примечания и закладки не сохраняются в документе, поэтому их нельзя распечатать или передать другим пользователям.

- 1 Чтобы добавить закладку для страницы в боковой панели или в главном окне приложения нажмите [] + [B]. Страница будет добавлена в список Закладок, доступный на левой боковой панели. Нажав правой кнопкой мыши на закладке в появившемся контекстном меню ее можно переместить, переименовать, или удалить.
- 2 Чтобы создать примечание для страницы нажмите [F6] и выберите один из инструментов рецензирования в появившейся панели. Примечание будет добавлено в список Рецензирование с указанием имени пользователя создавшего его. Используйте значок в нижней части боковой панели для группировки примечаний по страницам, по авторам или, чтобы отобразить примечания только для текущей страницы.



- 3 Чтобы открыть всплывающее окно и добавить текст в примечание (или удалить примечание), нажмите правой кнопкой мыши по примечанию в списке Рецензирование и выберите соответствующий пункт меню. Добавленные примечания или выделения автоматически присоединяются к файлу, поэтому нет необходимости сохранять их.


### 2.13.2 Использование Acrobat Reader

Если Acrobat Reader не установлен по умолчанию — установите пакет `acroread` с помощью YaST. Чтобы запустить Acrobat Reader нажмите [] + [F2] и введите `acroread`. Нажмите Файл > Открыть, выберите нужный PDF-файл и нажмите Открыть, чтобы увидеть содержимое этого файла.

## 2.14 Поиск данных

KDE предлагает множество приложений для осуществления поиска данных на компьютере или в файловой системе. Одним из таких приложений является KFind, работа с которой описывается ниже.

### 2.14.1 Использование KFind

Чтобы воспользоваться простым и расширенным поиском, используйте KFind. Запустить эту программу можно из Главного меню, выбрав Приложения > Поиск файлов и папок или нажав  + [F2] и введя `kfind`.

#### Процедура 2.13 Поиск по имени

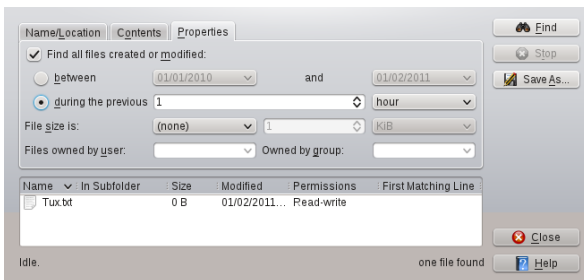
Чтобы использовать имя файла (или его часть) как поисковый запрос, выполните следующее:

- 1 Введите имя файла или только его часть в поле Имя файла. Используйте специальные символы, такие как звездочка (\*), чтобы указать недостающие символы в имени файла.
- 2 Укажите папку в которой необходимо произвести поиск файла. Также можно ввести путь до нужной папки в поле Искать в или нажав Просмотр..., чтобы указать расположение папки.
- 3 Для поиска в подкаталогах, отметьте Включая вложенные папки.
- 4 Нажмите Поиск, чтобы начать поиск. Результаты поиска отобразятся в нижней части диалогового окна. Чтобы открыть найденную папку, просто нажмите на нее. По нажатию правой кнопки мыши можно выбрать одну из функций контекстного меню.

#### Процедура 2.14 Поиск по содержимому и свойствам файла

Для более детального поиска, можно задать дополнительные опции, такие как текст, который должен содержать файл, или время последнего изменения файла. Для поиска по содержимому или свойствам выполните:

- 1 На вкладке Имя и расположении определите путь, где следует искать файл. Поле Имя файла можно оставить пустым.
- 2 Чтобы найти определенное содержимое в файле, перейдите на вкладку Содержимое. В поле Содержит текст, введите слово или фразу, которую требуется найти. Эта функция работает не для всех типов файлов.
- 3 Для поиска по свойствам, таким как время создания или время последнего изменения файла, перейдите на вкладку Свойства и выберите необходимые опции.



- 4 Нажмите Поиск, чтобы начать поиск.

## 2.14.2 Использование локального поиска Strigi

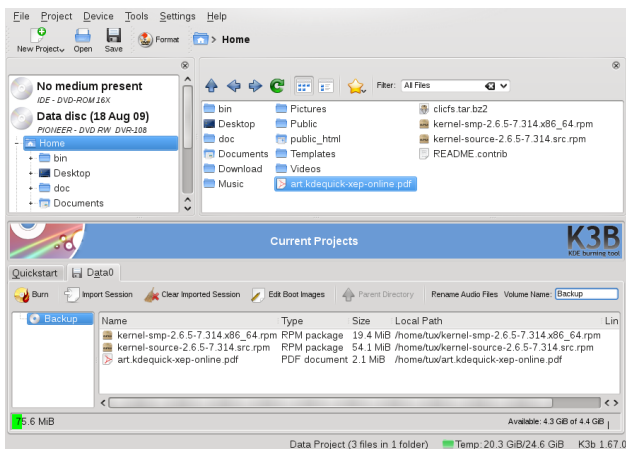
Демон локального поиска Strigi предоставляет возможность расширенного поиска с учетом таких метаданных как теги, оценки и даже URL-источник загрузки. Для этого потребуется запустить службы `neromuk` и `strigi`. Для активации этих служб нажмите [] + [F2] и введите `strigi`. Выберите Настройка сервера Neromuk/Strigi, чтобы открыть окно настройки. Включите две службы на вкладке Основные параметры и закройте это окно нажав Применить и OK.

После активирования этих служб можно использовать KRunner ([] + [F2]) для поиска файлов только вводя ключевые слова. Интерфейс расширенного поиска доступен в файловом менеджере Dolphin. Нажмите в Dolphin [] + [F] для активации локального поиска. можно задать фильтр для результатов поиска: Имена файлов, Содержимое или расположение.

## 2.15 Создание CD или DVD

Если вы являетесь обладателем CD или DVD привода с поддержкой записи, то можно записывать файлы на CD или DVD при помощи K3b. Чтобы записать данные на диск, выполните следующее:

- 1 Нажмите [] + [F2] и введите `k3b`. Откроется программа K3b.
- 2 Выберите Файл > Создать проект > Новый проект с данными из главного меню.
- 3 Используйте дерево просмотра в левой части окна для поиска файлов или папок, которые нужно записать на диск. Когда они появятся в верхней правой части окна, перетаскивайте их в окно Текущие проекты.



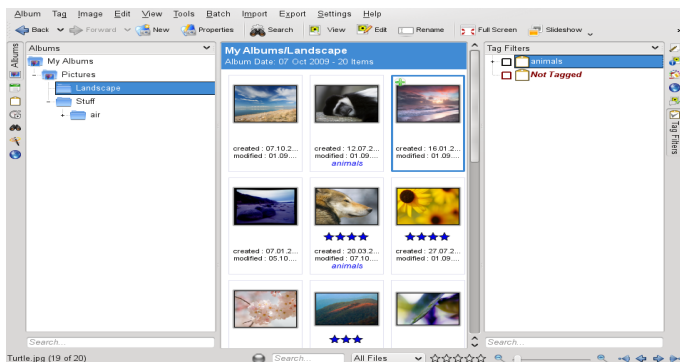
- 4 Вставьте записываемый диск в устройство и нажмите на Записать.
- 5 Проверьте настройки на вкладке Запись. Обычно не нужно вносить какие-либо изменения. Если желаете, можете изменить информацию о проекте на вкладке Файловая система.
- 6 Нажмите Записать.

## 2.16 Управление коллекцией цифровых изображений

C digiKam очень просто управлять цифровыми изображениями: загружать их с камеры, править и улучшать, объединять в альбомы (или создавать метки для простого поиска независимо от папок или альбомов), и архивировать их на CD, или экспортировать в Веб-галерею.

digiKam также содержит ряд полезных функций и дополнений, которые позволяют преобразовывать многочисленные изображения в различные форматы, переименовывать сразу множество изображений, или автоматически улучшать их с помощью специальных функций, таких как удаление эффекта "красных глаз", шумоподавление и удаление "горячих" пикселей. Различные фильтры и дополнения к программе позволяют создавать произведения искусства из ваших фотографий.

Чтобы запустить digiKam нажмите **[ ] + [F2]** и введите `digikam`. При первом запуске появляется мастер первоначальной настройки, в котором будет задать некоторые настройки.

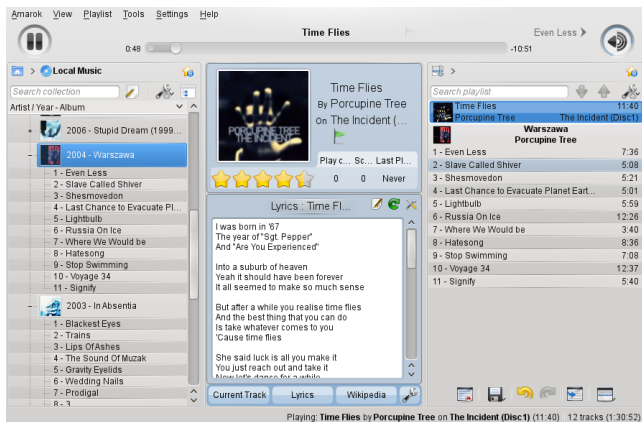


Главное окно digiKam содержит древовидное представление коллекции в левой части окна и отображает миниатюры изображений в правой части. Для быстрого доступа к изображениям используйте боковую панель слева, с помощью которой можно переключаться между различными видами, например, сортировать изображения по Альбомам, Дате, Меткам или Поисковым запросам. Чтобы переключить digiKam в режим просмотра или редактирования нажмите два раза по миниатюре.

## 2.17 Управление музыкальной коллекцией

Аудиоплеер KDE Amarok позволяет прослушивать различные звуковые форматы, создавать списки воспроизведения, слушать потоковое вещание радиостанций в Интернете и подписываться на подкасты. Поддерживаемые типы файлов зависят от механизма, используемого в Amarok.

Для запуска Amarok нажмите **[F2]** и введите `amarok`. При первом запуске Amarok попросит указать каталог, в котором находятся аудио файлы.



В главном окне Amarok присутствует боковая панель в левой его части, с помощью которой можно переключаться между различными видами: музыкальной коллекцией, адресами для прослушивания подкастов или потокового радиовещания в Интернет, списками воспроизведения и файловым навигатором. В средней части, контекстном навигаторе, отображается информация о текущей дорожке, сведения об артисте и текст песни из Википедии. Правая часть окна отображает текущий список воспроизведения. Чтобы запустить воспроизведение музыки достаточно перетащить элементы из любой боковой панели в список воспроизведения. Двойное нажатие на элементе в списке воспроизведения запускает его воспроизведение.

Если музыкальные файлы содержат корректные метаданные (по крайней мере содержат информацию об артисте и альбоме), то можно воспользоваться несколькими замечательными возможностями Amarok. Чтобы автоматически получать изображение обложки диска с Amazon, выберите Сервис > Управление обложками и нажмите Загрузить недостающие обложки. При следующем воспроизведении песни из этого альбома, обложка отобразится в контекстном навигаторе и в экранном уведомлении. Чтобы узнать больше об артисте нажмите на кнопку Википедия в средней части окна, чтобы Amarok выполнил поиск подходящей статьи в Википедии.

Чтобы настроить любой другой механизм (или других функций Amarok), выберите Настройка > Настроить Amarok....

## 2.18 Выход из системы

Выход из системы (без завершения работы системы), перезагрузка или выключение компьютера.



## 2.18.1 Завершение сеанса или переключение пользователя

Нажмите на значок Главное меню на панели и выберите Выход > Завершить сеанс KDE. Сеанс завершится, но система продолжит свою работу. Чтобы запустить параллельный сеанс с другим пользователем выберите Выход > Переключить пользователя.

## 2.18.2 Перезагрузка или выключение компьютера

Нажмите Выход, затем выберите один из следующих вариантов:

### Ждущий режим

Доступно только, если компьютер поддерживает функции управления питанием. Приостанавливает работу компьютера без завершения сессии. Все данные и данные сессии сохраняются в оперативной памяти (RAM).

### Спящий режим

Доступно только, если компьютер поддерживает функции управления питанием. Приостанавливает работу компьютера без завершения сессии. Все данные и данные сессии сохраняются на диске до выключения компьютера. Таким образом вы будете защищены от потери данных даже, если питание компьютером будет отключено.

### Перезагрузить

Перезапускает компьютер.

### Выключить

Закрывает текущий сеанс, затем выключает компьютер.

## 2.19 Дополнительная информация

Дополнительную информацию о KDE и приложениях KDE смотрите на <http://www.kde.org/> и <http://www.kde-apps.org/>.



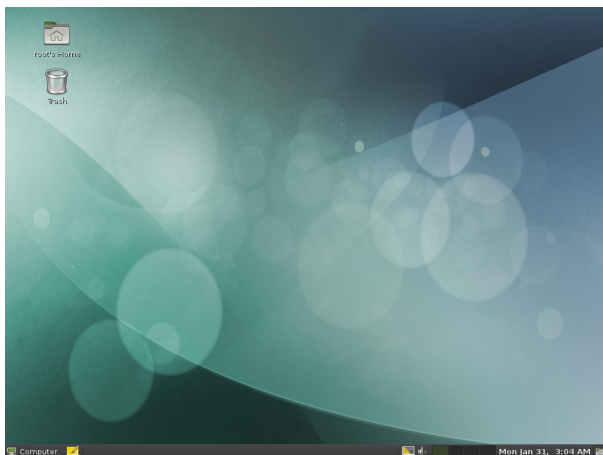
### 3 GNOME Быстрый старт

provides the tools that Linux\* users require in their daily activities. It comes with an easy-to-use graphical environment, the GNOME\* desktop, that communicates with the underlying Linux system, to let you access and manage files, folders, and programs. provides an integrated suite of applications for a wide range of office, multimedia, and Internet activities. The LibreOffice suite, which allows you to edit and save files in a number of formats, is also included. The office suite is available for several operating systems. Therefore, you can use the same data across different computing platforms.

## 3.1 Getting Started

When you start your system, you are usually prompted to enter your username and password. If someone else installed your system, check with your system administrator for your username and password.

After logging in to GNOME for the first time, you see the GNOME desktop, offering the following basic elements:



**Desktop Icons:** Access programs and features on your system by double-clicking an icon. Right-click an icon to get additional menus and options. By default, the desktop features several key icons, including your personal Home folder and a trash can for deleted items. Other icons representing devices on your computer, such as CD drives or USB flash disks, may also be present on the desktop, and you can add as many icons on your desktop as you like. If you double-click your Home folder, the Nautilus file manager starts and displays the contents of your home directory.

**Bottom Panel:** The desktop includes a panel at the bottom of the screen. This panel contains the Computer menu, the Tomboy Notes applet, a taskbar to display buttons for all currently running applications, and the system tray. You can also add applications and applets to the panel for easy access.

**Main Menu:** Click Computer on the left side of the bottom panel to open the main menu. Commonly used applications appear in the main menu along with recently used applications. Click the Documents button to display your recent documents, or click the Places button to display your favorite places (such as your home directory, your desktop, or available network servers). Click More Applications to access additional applications, listed in categories. Use the options on the right to access help, open the Центр управления GNOME, run YaST, install additional software, lock your screen, log out of the desktop, shut down the system, or check the status of your hard drive and network connections.

**System Tray:** The right side of the bottom panel shows some smaller icons, including the system clock that displays the current date and time, the Workspace Switcher, the volume control, and icons for several other helper applications.

**Taskbar:** By default, all applications running on the current desktop are displayed in the taskbar (the area in the middle of the panel between the Computer button and the system tray). You can access these applications by clicking their names in the taskbar. Right-click the application's name to see options for moving, restoring, or minimizing the window.

**Desktop Menu:** Right-click an empty spot on the desktop to display a menu with various options. Click Create Folder to create a new folder on the desktop. Use Create Launcher to create a launcher icon for an application. Provide the name of the application and the command for starting it, then select an icon to represent it. You can also change the desktop background, open a terminal, create a document, and align desktop icons.

### 3.1.1 Modifying Desktop Panels

The bottom panel can be customized to meet your individual needs, and additional panels can be added and configured to further personalize your desktop.

To add a new panel, right-click a blank space in the bottom panel and select New Panel. To delete a panel, right-click a blank space in the panel and select Delete This Panel. requires that at least one panel is left on the desktop.

### 3.1.2 Adding and Removing Panel Icons

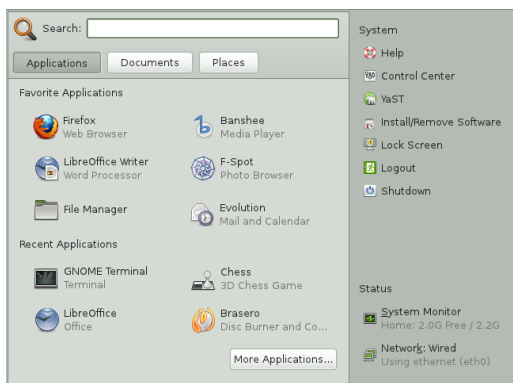
- 1 Right-click a blank space on the panel and select Add to Panel.
- 2 Browse to the desired program and double-click it to add it to the panel.
- 3 To remove a program icon from a panel, right-click its icon in the panel and select Remove From Panel.

## 3.2 Starting Programs

Start programs from the Main Menu or from the command line, using a shell or the Run Command. Additionally, you can start programs from the desktop or the panel by left-clicking the program icon once.

### 3.2.1 Using the Main Menu

To run a program in , click Computer on the panel to open the main menu screen. If the program you want does not appear in the main menu screen, click More Applications to view a list of all available applications grouped in categories. You can also limit the list to show only applications with a specific name by entering all or part of the name into the Filter field. Click an entry in the list to start the corresponding program.

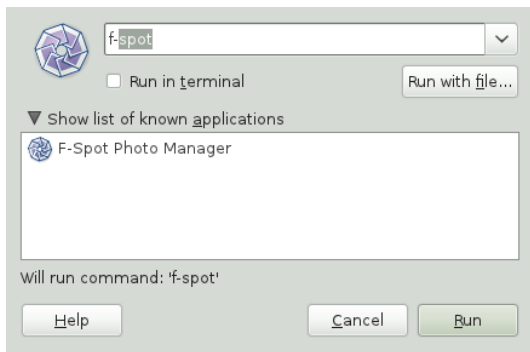


You can also add an icon to your panel that opens a more traditional version of the main menu. Right-click a blank space on the panel, select Add to Panel, then double-click Traditional Main Menu.

If you already know the name of an application but are not sure how to start it from the main menu, use the Search field in the main menu. Click Computer, type a portion of the application name in the Search field, then press **[Enter]**. If the application is installed on your system, the name of the application appears in the Needle search dialog box. Click the name to start the program.

### 3.2.2 Using the Run Application Dialog

Press **[Alt] + [F2]** to open the Run Application dialog. Type a command, for example, `f-spot`, and press **[Enter]** or click Run to start the application. The command to start the application is often (but not always) the application name written in lowercase.



## 3.3 Handling Media

If you insert a CD or DVD into your drive or plug in a pluggable device (for example, a USB stick or removable hard disk), GNOME opens Nautilus and shows the content of the media.

## 3.4 Customizing Your Desktop

Easily add, delete, and create shortcut icons on your desktop. You can also change icon properties and the desktop background to suit your needs.

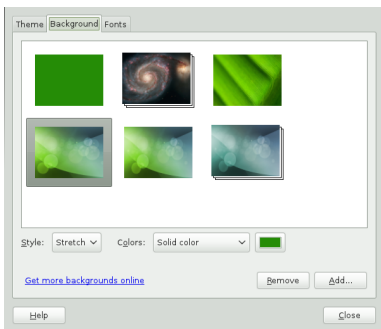
### 3.4.1 Adding Program Icons to Your Desktop

- 1 Click Computer.
- 2 Browse to the desired program.
- 3 Click and drag the icon to the desktop and position it as desired.

To delete an icon from your desktop, simply click the program icon and press the [Delete] key on your keyboard.

### 3.4.2 Changing the Desktop Background

- 1 Right-click the background.
- 2 Select Change Desktop Background.

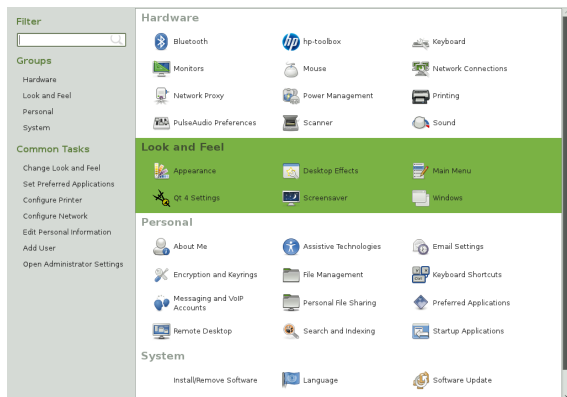


- 3 To select a wallpaper from the pre-installed images, browse to and select the desired image. After you select it, the background changes automatically.
- 4 To add an image, select Add, browse to the desired image, then click Open.
- 5 To display a colored background, select the solid color rectangle from the top of the list; then, from Colors, select the fill pattern and the desired colors.
- 6 Click Close.

### 3.4.3 Using the Центр управления GNOME

In addition to letting you change individual desktop elements, GNOME lets you extensively personalize your desktop. You can find more settings to adjust the overall appearance and behavior of your desktop in the Центр управления GNOME. There, you can also change fonts, keyboard and mouse configurations, regional and language settings, parameters for your Internet and network usage, and more.

To start the Control Center, click Computer, then click Control Center on the right of the main menu.



## 3.5 Applying Desktop Effects

If your computer supports a 3D graphics card with Xgl, you can use graphical effects like turning your desktop into a rotating 3D cube, enabling translucent or transparent windows, and zooming in and out of the desktop screen. You can also use other window effects such as shadows, fading, and transformations. If you do not have a 3D graphics card, some effects may be disabled or reduce the performance of your system. If the performance of your system is too low, disable the compositing effect for your current session with `[] + [] + [F12]`.



To configure the effects on your desktop, proceed as follows:



- 1 Start the personal settings window as described in [Раздел 3.4.3, «Using the Центр управления GNOME»](#) (стр. 47).
- 2 Select Look and Feel > Desktop Effects and choose Enable Desktop Effects. If your graphic card does not support 3D, you will be notified.
- 3 Select the effects in one of the tabs.

## 3.6 Using Virtual Desktops

The desktop environment allows you to organize your programs and tasks on several virtual desktops. If you often run a lot of programs simultaneously, this minimizes the number of windows to arrange on your screen. You might, for example, use one desktop for e-mailing and calendaring and another for word processing and graphics applications.

### Процедура 3.1 Moving an Application to Another Virtual Desktop

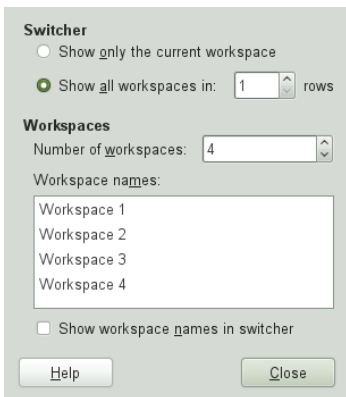
You can display a running application on one or all virtual desktops, or move it to other desktops.

- 1 Open the application.
- 2 Right-click the title bar of the application.
- 3 Click Move to Another Workspace.
- 4 Select the desktop on which to place the application.
- 5 To switch between desktops, click the desired desktop in the pager in the panel.

### Процедура 3.2 Adding Additional Virtual Desktops

Some users might need more desktops than are provided by default. To add additional desktops, do the following:

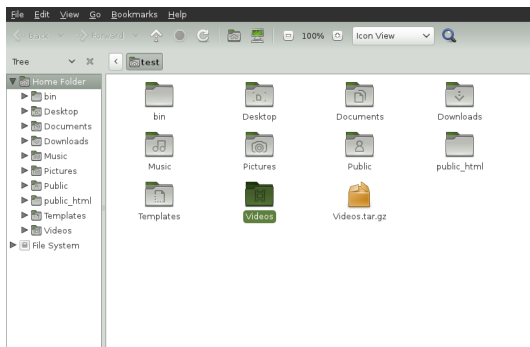
- 1 Right-click the pager in the panel and select Preferences. A configuration dialog appears:



- 2 Decrease or increase the Number of Workspaces.
- 3 If you want to change the names of the desktops double click on the list entries and enter the new names.

## 3.7 Managing Files and Folders

Use the Nautilus File Manager to create and view folders and documents, run scripts, and create CDs of your data. To open Nautilus, double-click your home directory icon on the desktop. You see the contents of your home directory.



The elements of the Nautilus window include the following:

Menu Lets you perform most tasks.

**Toolbar** Lets you quickly navigate among files and folders, and provides access to files and folders.

**Location Bar** Lets you locate files, folders, and URI sites. If you prefer text based location display to the button based one, select **Go > Location**.

**Side Pane** Lets you navigate or display information about the selected file or folder. Use the drop-down list to customize what is shown in the pane. The list includes ways to view information about files, perform actions on files, attach emblems to files, view a history of recently visited sites, and display your files in the tree system.

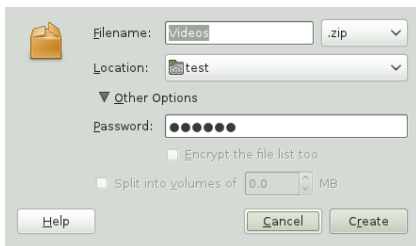
**View Pane** Displays folders and files. Use the options on the **View** menu to increase or decrease the size of content in the view pane and to display items as a list or as icons.

**Status Bar** Displays the number of items in a folder and gives the available free space. When a file is selected, the status bar displays the filename and size.

### 3.7.1 Archiving Folders

If you have files you have not used recently but want to keep on your computer, you can compress the files into a tape archive (TAR) format.

- 1 In the Nautilus view pane, right-click the folder you want to archive and select **Compress**.



- 2 Accept the default archive filename or provide a new name.
- 3 Select a file extension from the drop-down list. Use `tar.gz` for the most common archive form. Use `zip` if you need to protect the archive with a password.
- 4 Specify a location for the archive file, then click **Create**.

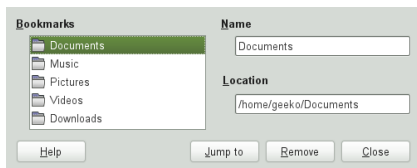
To extract an archived file, right-click the file and select **Extract Here**.

### 3.7.2 Using Bookmarks

Use the Nautilus bookmarks feature to mark your favorite folders.

- 1 Open the folder you want to create a bookmark for.
- 2 Click Bookmarks > Add Bookmark. The bookmark is added to the list, with the folder name as the bookmark name.
- 3 To select an item from your bookmarks list, click Bookmarks, then click the desired bookmark in the list.

You can also organize your bookmarks list by clicking Bookmarks > Edit Bookmarks and making your selections in the dialog box.



To change the order of your bookmarks, click a bookmark shown in the Edit Bookmarks dialog and drag it to the desired location.

## 3.8 Browsing the Internet with Firefox

Firefox\* is one of the most popular Web browsers. It has all the familiarity of other browsers, plus added features such as security and privacy tools.



To start Firefox, click Computer > Firefox Web Browser.

With features like tabbed browsing, pop-up window blocking, and download and image management, Firefox combines the latest Web technologies. Its easy access to different search engines helps you find the information you need. Enter a URL in the location bar to start browsing.

To open a new empty tab in Firefox, press **Ctrl** + **T** or the «+» button next to the last tab . Type a new URL to browse. To open a link in a new tab, click the link with your middle mouse button. Right-click a tab to access more tab options. You can create a new tab, reload one or all existing tabs, or close a single tab or all tabs. You can also change the sequence of the tabs by dragging and dropping them to a new position.

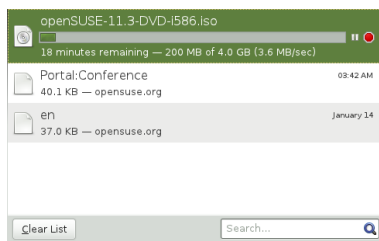
### 3.8.1 Finding Information

- 1 To start a search on the Web type your search keywords in the integrated search box on the right of the location bar, then press **Enter**. The results are displayed in the active window or tab.
- 2 To use a different search engine than the default, click the icon in the search box to open a list of other search engines.
- 3 Click the desired engine, then press **Enter** to start the search.

To search the current Web page for words, press **Ctrl** + **F** to open the Find bar at the bottom of the window. Enter your search keyword there and use the buttons to the right of the box to search in different directions or to select all hits in the text.

### 3.8.2 Downloading Files from the Web

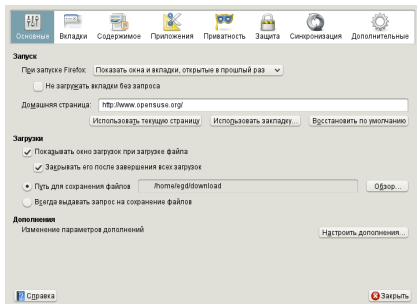
If you download a file with Firefox, the Firefox download manager starts and saves this file to the folder configured in Firefox Preferences. By default, the **Downloads** folder in your home directory is the destination for downloaded files. Firefox shows your finished downloads in the Downloads window.



Open the downloaded files directly from the Downloads window or from the destination folder. To clean up the history of downloaded files, click Clean List.

### 3.8.3 Configuring Preferences

To adjust the default download folder or to activate or modify the pop-up blocking feature, click **Edit > Preferences**.



Here also configure many other settings such as appearance, language, privacy, and tab options. Click the icons and set the options on each page according to your preferences. Click Close to apply the changes.

## 3.9 Managing Passwords

GNOME allows you to store your passwords and encryption keys in a keyring. This is useful if you want to store passwords for different web sites.

To create a new keyring, proceed as follows:

- 1 Press **[ ] + [F2]** and enter `seahorse`.
- 2 Select **File > New**.
- 3 Choose **Password Keyring** and proceed with **Continue**.
- 4 Enter a name for your keyring. Then, a dialog box opens.
- 5 Enter your password, confirm the password, and click **OK**.

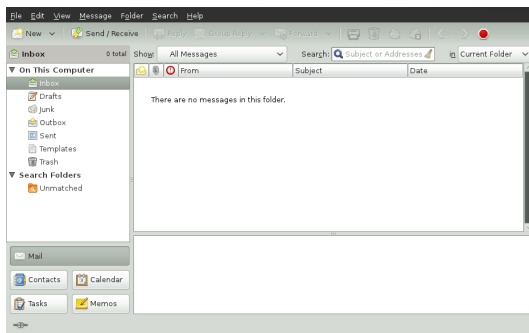
You can create as many keyrings as you like. For example, you can create one for private and one for business. To store passwords in your keyring, proceed as follows:

- 1 Press **[ ] + [F2]** and enter `seahorse`.
- 2 Select **File > New**.
- 3 Choose **Stored Password** and proceed with **Continue**.
- 4 Select your keyring, enter description and password.
- 5 Finish with **Add**.

## 3.10 E-Mailing and Calendaring

For reading and managing your mail and events, offers you Evolution™, a groupware program that makes it easy to store, organize, and retrieve your personal information.

Evolution seamlessly combines an e-mail, a calendar, an address book, and a task list in one easy-to-use application. With its extensive support for communications and data interchange standards, Evolution can work with existing corporate networks and applications, including Microsoft® Exchange.



To start Evolution, click Computer > Evolution Mail and Calendar.

The first time you start it, Evolution prompts you with a few questions as it sets up a mail account and helps you import mail from your old mail client. It shows you how many new messages you have and lists upcoming appointments and tasks, as well as the current weather and news from news feeds. The calendar, address book, and mail tools are available in the shortcut bar on the left.

Press **[N]** to open a new item for whatever part of Evolution you are working in. In mail, this creates a new message. If you are in the address book, **[N]** creates a new contact card, and in the calendar, it creates a new appointment.

For more information on using Evolution, click Help > Contents in any Evolution window.

## 3.11 Instant Messaging with Empathy

Empathy is a multiprotocol instant messaging (IM) client. It is compatible with AOL\* Instant Messenger (AIM), Google Talk, GroupWise® Messenger, ICQ, IRC, MSN Messenger, Jabber/XMPP, Yahoo!\*, and other networks.

With Empathy, you can log in to multiple accounts on multiple IM networks simultaneously. Empathy also supports many features of the various networks, such as video chat, file transfer, away messages, and typing notification.

To start Empathy, click Computer > More Applications > Internet > Empathy, or press [Alt] + [F2] and enter `empathy`.

To add an account to Empathy, either use the initial configuration wizard, or select Edit > Accounts. Click Add and select the protocol you want to use, and type your login information in the appropriate fields. Click Log in to activate you IM account. Finally click Close to start chatting with your friends.

Add contacts by clicking Chat > Add Contact. Select account, identifier and alias information relevant for the new contact and confirm with Add. However, you must be online and connected to the selected messaging service to add a contact to your list.

To start a chat, double-click the desired contact and type your message in the lower part of the chatting window. Press [Enter] to send the message. The upper part of the window displays the messages you have sent and received.

## 3.12 Starting LibreOffice

The LibreOffice office suite offers a complete set of office tools, including word processing, spreadsheet, presentation, vector drawing, and database components. Because LibreOffice is available for a number of operating systems, you can use the same data across multiple platforms.

To start LibreOffice, click Computer > LibreOffice Writer. To create a new document, click File > New, then choose the type of document you want to create. To open an existing document, click Open, then select the file you want from the file system.

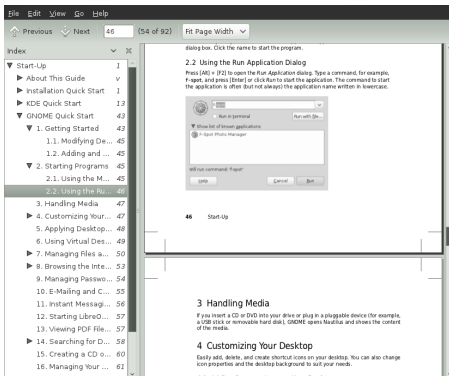
## 3.13 Viewing PDF Files and Other Documents

Documents that need to be shared or printed across platforms are often distributed as PDF (Portable Document Format) files. PDF files can be created using the LibreOffice suite or other applications. The GNOME PDF viewer is called Evince. It can be used to view PDFs and many other document formats, like PostScript, DjVu, DVI, and multi-page TIFFs.

To start Evince, press [Alt] + [F2] and enter `evince`.

- 1 To view a PDF file, double-click the PDF file.





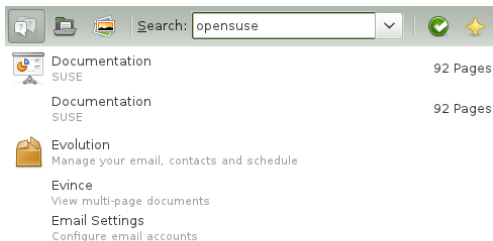
- 2 Use the navigation icons at the top of the window to navigate through the document. If the PDF document provides bookmarks, you can access them in the left panel of the viewer.

## 3.14 Searching for Data

GNOME provides more than one application for finding data on your computer or in the file system.

### 3.14.1 Using Desktop Search

To locate files or programs on your computer, click **Computer**. Enter a search term in the **Search** field and press **[Enter]**. The results are displayed in the **Needle**.



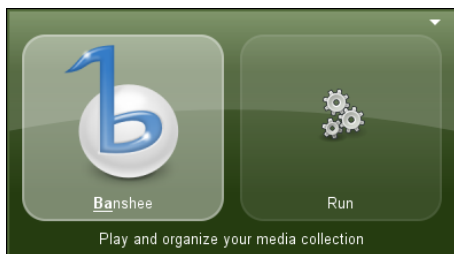
You can also start the **Needle** application by clicking **Computer > More Applications > Accessories > Desktop Search**.

### 3.14.2 Using GNOME Do

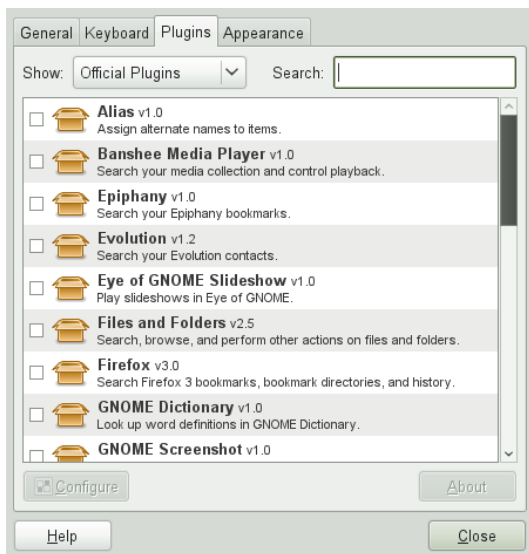
GNOME Do describes itself as an «intelligent launcher that makes performing common tasks on your computer simple and efficient.» It is extensible with plug-ins.

Start it by pressing [Super] + [Space]. The [Super] is normally located on the left and right [Windows] or [Penguin] key.

GNOME Do allows you to perform specific actions. For example, if you type **b**, it displays a starter button for the Banshee, the music player:



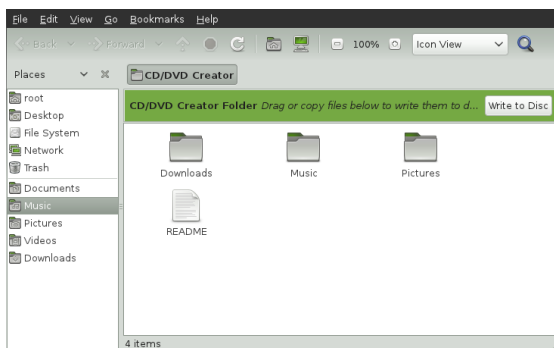
To customize GNOME Do to your needs, select the arrow button on the upper-right corner of the window and select Preferences. It gives you a list of plug-ins to search for mails in Evolution, listen to your music, etc.



## 3.15 Creating a CD or DVD

If your system has a CD or DVD writer, use the Nautilus file manager to burn CDs and DVDs.

- 1 Click Computer > More Applications > System Tools > CD/DVD Creator, or just insert a blank disk.
- 2 Copy the files and folders you want to put on the CD or DVD into the Nautilus CD/DVD Creator window.



- 3 Click Write to Disk.
- 4 Modify the relevant information in the Write to Disk dialog box, or accept the default values, then click Write. The files are burned to the disk. This could take a few minutes, depending on the amount of data being burned and the speed of your burner.

You can also use the more advanced burning tool Brasero, or Banshee to burn data and audio CDs.

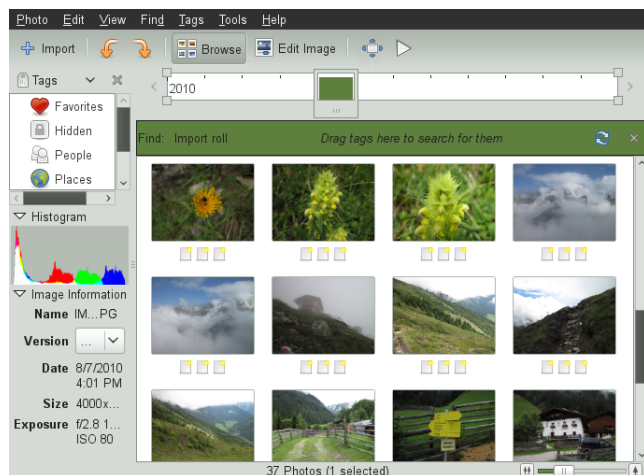
## 3.16 Managing Your Digital Image Collection

F-Spot is a management tool for your collection of digital images, tailored for the GNOME desktop. It allows you to assign different tags to your images in order to categorize them, and offers various image editing options. For example, you can remove red-eye, crop, and adjust brightness and colors. F-Spot supports all important image formats, including JPEG, PNG, TIFF, and several vendor specific RAW formats.

You can import photos from your hard drive, your digital camera, or your iPod. You can also use F-Spot to create photo CDs, generate a Website gallery, or export your photos to your Flickr, 23, Picasa Web, or SmugMug account.

To access F-Spot, click Computer > F-Spot Photo Browser or press `[C] + [F2]` and enter `f-spot`. The first time you run F-Spot, you must define the location from where

you want to import images into your collection. If you already have a collection of images stored on your hard drive, enter the path to the directory and (optionally) include subfolders. F-Spot imports these images into its database.



Thumbnails of your images are displayed in the right part of the window, and detailed information for a selected image is displayed in a sidebar to the left. By default, your photos are displayed in reverse-chronological order, so your newest photos are always at the top. You can sort your photos in chronological order or reverse-alphabetical order by clicking **View > Reverse Order**.

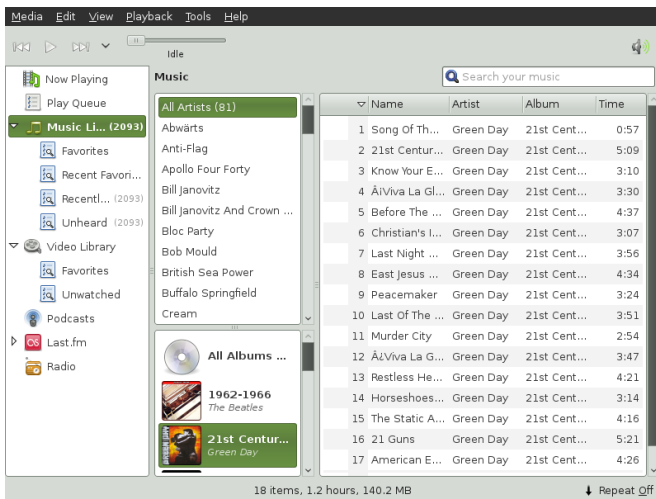
A menu bar at the top of the window allows you to access the main menus. A toolbar below offers several different functions depicted by a matching icon.

## 3.17 Managing Your Music and Videos

Use Banshee to import CDs, sync your media collection to a digital media player, play music directly from a digital media player, create playlists with songs or videos from your library, create audio and data CDs from subsets of your library, and subscribe to, download, and listen to your favorite podcasts. Banshee also has an Internet Radio plug-in that allows you to listen to audio streams.

To open Banshee, click **Computer > Banshee Media Player** or press **[I] + [F2]** and enter `banshee-1`.

When you start Banshee for the first time, you need to import your media to make them available in the library. To do so, select **Media > Import Media** from the menu. Choose an import source and click **Import**. After successfully importing your media, you can access them from your library.



To play a song or a movie, simply select it in the library and click the play button. You can also use the buttons in the upper left corner to pause a song or play the next or previous song. Use the loudspeaker button on the right to adjust the volume.

Banshee also has an integrated CD player. When you insert a music CD, your CD title appears in the left panel. Select the title and click the Play button to play your full CD.

To create audio and MP3 CDs, select the songs you want, then click the Edit > Write CD from the menu.

## 3.18 Logging Out

When you are finished using the computer, you can log out and leave the system running, or restart or shut down the computer.

### 3.18.1 Logging Out or Switching Users

Click Computer > Logout, then select one of the following options:

**Log out** Logs you out of the current session and returns you to the login screen.

**Switch User** Suspends your session, allowing another user to log in and use the computer.

### 3.18.2 Restarting or Shutting Down the Computer

Click Computer > Shutdown, then select one of the following options:

**Shutdown** Logs you out of the current session, then turns off the computer.

**Restart** Logs you out of the current session, then restarts the computer.

**Suspend** Puts your computer in a temporary state that conserves power. The state of your session is preserved, however, including all applications you have running and all documents you have open.

**Hibernate** Suspends your session, using no power until the computer is restarted. The state of your session is preserved, however, including all applications you have running and all documents you have open.

## 3.19 For More Information

To learn more about GNOME and GNOME applications, refer to <http://www.gnome.org/>.

## 4 LibreOffice Быстрый старт

LibreOffice — ранее известный как OpenOffice.org — это пакет многофункциональных офисных приложений с открытым исходным кодом, предоставляющий инструменты для всех типов офисных задач, таких как написание текстов, работа с таблицами, создание графиков, научных формул и презентаций. С LibreOffice вы можете использовать свои данные на разных компьютерных платформах. Также возможно открытие и редактирование файлов других форматов, включая форматы Microsoft Office и, затем сохранить их в выбранном формате.

Полный список новых возможностей, доступных в LibreOffice 3.4 описан в <http://www.libreoffice.org/download/3-4-new-features-and-fixes/>.

### 4.1 Совместимость

LibreOffice может работать с текстовыми документами, таблицами, презентациями и базами данных разных форматах, включая форматы Microsoft Office. С ними легко начать работать как и с файлами других форматов, а так же сохранить в исходном формате. Хотя такие файлы можно использовать при совместной работе, тем не менее, иногда возникают сложности с форматированием. Если в документе выявилось нарушение форматирования, то необходимо открыть их в оригинальном приложении и повторно сохранить в открытом формате для текстовых документов, таком как, например, RTF. В случае возникновения проблем с отображением табличных файлов, рекомендуется повторно сохранить эти файлы в формате Excel и использовать его как промежуточный формат (с форматом CSV возможна утрата форматирования ячеек; CSV иногда приводит к некорректному распознаванию типов ячеек).

### 4.2 Приложения LibreOffice

LibreOffice содержит несколько приложений (субпрограмм), спроектированных на взаимодействия друг с другом. Все приложения имеют схожий графический интерфейс пользователя и подобные функциональные возможности.

Таблица 4.1 Приложения LibreOffice

Приложение	Назначение
Writer	Текстовый процессор
Calc	Электронные таблицы
Impress	Создание презентаций

Приложение	Назначение
Base	Работа с базами данных
Draw	Векторный графический редактор
Math	Составление математических выражений

## 4.3 Что нового в LibreOffice

Со времени последнего выпуска было внесено множество улучшений во всех компонентах LibreOffice. Вот некоторые из них:

### Общее меню поиска

Единое меню поиска теперь представлено в каждом приложении LibreOffice для легкого поиска текстовых связей между открытыми документами. Поиск можно активировать, перейдя в меню Вид > Панели инструментов > Найти.

### Справка в Интернет

Если ни один файл справки (`libreoffice-help-*`) не установлен, то LibreOffice пытается показать соответствующую страницу справки в Интернет с помощью Веб-браузера.

### Новый диалог Печать

Диалог печати был переработан с целью объединения в одном месте таких полезных функций, как простой предварительный просмотр страницы и выбор количества печатаемых на странице листов.

### Новый диалог Тезаурус

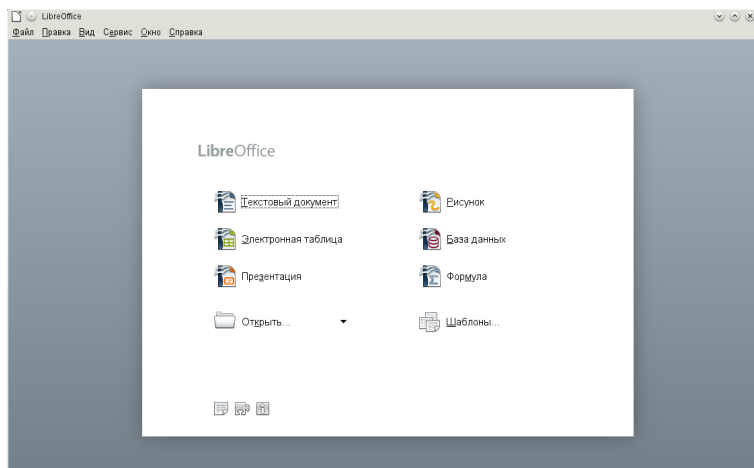
Диалог Тезаурус был улучшен и теперь в нем стало легче подобрать аналогичные или соответствующие термины для придания документам более отчетливого вида.

### Импорт альфа-канала для TIFF-изображений

Приложения LibreOffice теперь могут импортировать изображения RGBA TIFF вместе с информацией о прозрачных областях.



## 4.4 Запуск LibreOffice



Для запуска LibreOffice нажмите **[ ] + [F2]**, введите `ooffice` и нажмите **[Enter]**. В диалоге приветствия можно выбрать желаемое приложение. Если какое-нибудь приложение LibreOffice уже открыто, то можно запустить любое другое приложение путем нажатия **Файл > Открыть > Название приложения**.

### 4.4.1 Сохранение файлов LibreOffice

- 1 Для сохранения нового файла выберите **Файл > Сохранить** или **Сохранить** как из Меню или воспользуйтесь комбинацией клавиш **[ ] + [ ] + [S]**.
- 2 Выберите директорию, в которой нужно сохранить файл.
- 3 Введите имя файла в строке **Имя**.
- 4 В строке **Фильтр** выберите формат, в котором требуется сохранить файл.

В каждом приложении возможно сохранить свои документы как файлы LibreOffice, шаблоны LibreOffice или как файлы Microsoft и StarOffice.

### 4.4.2 Навигатор и комбинации клавиш

Инструмент Навигатор представляет информацию о содержимом документа. Он позволяет быстро перемещаться между различными элементами. Например, можно использовать навигатор для быстрого просмотра всех имеющихся в документе изображений. Чтобы открыть Навигатор нажмите **Вид > Навигатор** или

нажмите [F5]. Элементы перечисленные в окне Навигатор варьируются в зависимости от используемого приложения LibreOffice.

Кроме того, можно перемещаться по файлам используя следующие комбинации клавиш:

Таблица 4.2 Комбинации клавиш для навигации

Действие	Комбинация клавиш
Удалить до конца слова	Ctrl + F
Удалить до начала слова	Ctrl + B
К концу документа	Ctrl + End
В конец строки	Ctrl + J
Выбрать всё	Ctrl + A
В начало строки	Ctrl + Home
К началу документа	Ctrl + Home
Перейти на слово левее	Ctrl + Left
Перейти на слово правее	Ctrl + Right

### 4.4.3 Использование и создание шаблонов

LibreOffice поставляется с набором готовых шаблонов, также дополнительные шаблоны доступны в Интернет. Если необходимо создать собственный шаблон, то для этого нужно определить как должен выглядеть документ и создать стили используемые в шаблоне.

Для текстовых документов, таблиц, презентаций и векторных изображений можно с легкостью создать шаблон из уже существующих файлов, по следующим рекомендациям:

- 1 Запустите LibreOffice и откройте или создайте документ, содержащий стили, которые необходимо использовать как шаблон.
- 2 Нажмите Файл > Шаблоны > Сохранить.
- 3 Укажите название шаблона.

- 4 В подменю Категории выберите категорию, в которую нужно поместить новый шаблон.
- 5 Нажмите ОК.

## 4.5 LibreOffice Writer

LibreOffice Writer — это полнофункциональный текстовый процессор с богатыми возможностями форматирования текста и страниц. Его внешний вид похож на интерфейсы других подобных программ. Он имеет некоторые функции, которые, обычно, можно найти только в дорогостоящих издательских приложениях. Многие из функций LibreOffice Writer также задействованы в других приложениях LibreOffice.

### 4.5.1 Создание нового документа

Есть два способа создания нового документа:

- С нуля Чтобы создать совершенно новый документ нажмите **Файл > Создать > Текстовый Документ** и Writer создаст пустой документ.
- Мастер Для использования стандартного формата и предопределённых элементов в документах нажмите **Файл > Мастер > Письмо...** и следуйте указаниям мастера.
- Шаблоны Для использования шаблона нажмите **Файл > Создать > Шаблоны и документы**; выберите подходящую по названию папку (например, *Деловая корреспонденция*) и новый документ будет создан со стилями на основе выбранного шаблона.

Для использования стандартного формата и предопределённых элементов в документах, попробуйте мастер (небольшая утилита, которая позволяет на основе некоторых основных предварительных требований к документу создать его из подходящего шаблона). Например, для создания делового письма нажмите **Файл > Мастер > Письмо**. С помощью мастера можно создать простой документ со стандартным форматированием.

Введите желаемый текст в окне документа. Воспользуйтесь панелью инструментов **Форматирование** или меню **Формат** для придания документу нужного внешнего вида. Используйте меню **Файл** или соответствующие кнопки на панели инструментов для печати и сохранения документа. С помощью опций в меню **Вставка** можно добавить в документ дополнительные элементы, такие как таблицы, рисунки или графики.

### 4.5.2 Изменение настроек форматирования LibreOffice

В LibreOffice можно изменить установки по умолчанию с помощью меню **Формат**.

Далее приведен список наиболее востребованных опций, доступных в большинстве модулей:

#### Изменение настроек символов

Для одновременной настройки всех символьных элементов выберите **Формат > Символы**.

#### Изменение настроек абзаца

Для форматирования абзацев выберите **Формат > Абзац** и выберите соответствующий раздел для внесения изменений.

#### Изменение настроек выравнивания

Для изменения выравнивания текста выберите **Формат > Абзац** и выбрать желательное выравнивание.

#### Вставка верхнего и нижнего колонтитула

Для добавления верхнего или нижнего колонтитула нажмите **Вставка** и выберите, соответственно, **Верхний колонтитул** или **Нижний колонтитул**.

#### Вставка специальных символов

Для вставки специальных символов выберите **Вставка > Специальные символы**.

#### Вставка сноски

Для вставки сноски нажмите **Вставка** и выберите **Сноска**.

#### Вставка колонок

Для вставки колонок нажмите **Вставка** и выберите **Раздел....** На вкладке **Колонки** укажите требуемое количество колонок для данного раздела.

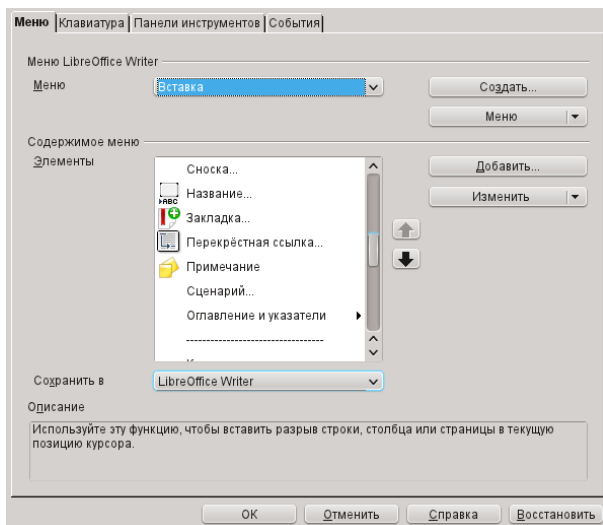
#### Вставка оглавления и указателей

Для вставки оглавления или указателя нажмите **Вставка** и выберите **Оглавление и Указатели**.

В меню **Настройка** доступны дополнительные опции форматирования.

#### Добавление комментариев

Если необходимо добавить к тексту комментарий для других людей работающих над данным документом или просто для себя нажмите **Вставка > Комментарий**.



### 4.5.3 Использование составного документа

При работе с очень большими документами (такими как книги), возможно, окажется более удобным работать с книгой при помощи составного документа, чем при хранении книги в виде единого документа. Составной документ позволяет быстро изменить форматирование всего документа или перейти в каждый вложенный документ для редактирования.

Составной документ — это документ LibreOffice Writer, который служит контейнером для множества файлов LibreOffice Writer. Можно работать над главами или другими документами, как индивидуальными файлами, собранными в составной документ. Составной документ особенно удобен, если несколько людей работают над одним документом. Можно выделить для каждого соответствующую часть документа в виде вложенного документа, позволяя работать над документом одновременно, без риска повредить или удалить записи друг друга.

- 1 Нажмите Создать > Составной Документ.

или

откройте существующий документ и выберите в меню Файл > Отправить > Создать составной документ.

- 2 Добавьте вложенные документы.
- 3 Нажмите Сохранить.

Файлы справки LibreOffice содержат более подробную информацию о работе с составными документами. Обратитесь к разделу Составные документы и вложенные документы.

## 4.5.4 Использование Writer для редактирования HTML

Являясь полнофункциональным текстовым процессором, Writer также может быть использован для редактирования HTML-файлов. Он воспринимает HTML-теги таким-же образом, как и любые другие стили в текстовом документе. Документ будет выглядеть так же, как он будет выведен на экран в Веб-браузере, или же Вы можете напрямую редактировать HTML-код.

- 1 Нажмите Файл > Создать > Документ HTML.
- 2 Нажмите F11 для открытия окна Стили и форматирование.
- 3 Нажмите на стрелку вниз окна Стили и форматирование.
- 4 Выберите Стили HTML.
- 5 Создайте HTML-документ, используя стили, чтобы пометить текст.
- 6 Нажмите Файл > Сохранить как.
- 7 Выберите местоположение для сохраняемого файла, имя файла, и укажите документ HTML (.html) в строке Файл.
- 8 Нажмите Сохранить.

Если необходимо напрямую редактировать HTML-код или необходимо видеть HTML-код создаваемый при редактировании HTML-файла, как текстового документа, нажмите Вид > Исходный текст HTML. В режиме отображения исходного кода окно стили и форматирование не доступно. При первом переключении в этот режим, будет предложено сохранить документ как HTML-файл, если это не было сделано ранее.

## 4.5.5 Таблицы

Можно включать табличные данные в документы модулей Writer, Impress и Draw. Вставить простую таблицу в документ можно при помощи соответствующих элементов меню или используя панель инструментов:

- Вставка > Таблицу...,
- Таблица > Вставить > Таблицу...,
- или использовать значок Таблицу на панели инструментов.

Название:

Размер таблицы:

Столбцы:

Строки:

Параметры:

☐ Заголовок

☒ Повторять заголовок

Первые  строк(и)

☐ Не разбивать таблицу

☒ Обрамление

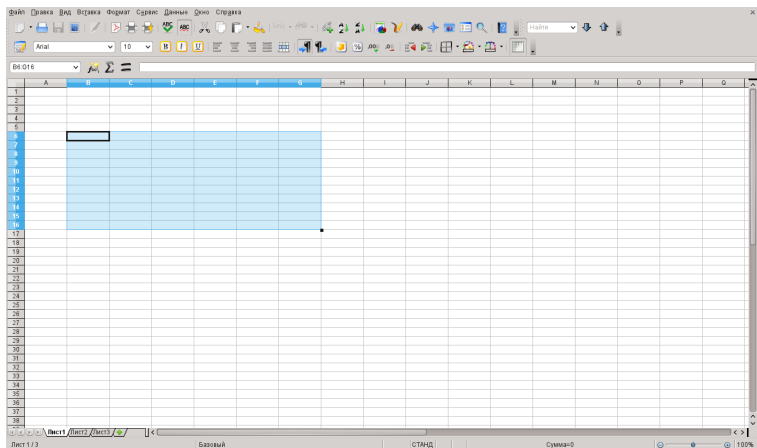
Для ввода данных выберите ячейку с помощью курсора мыши и начните вводить текст. Для перемещения между ячейками используйте клавиши со стрелками. **↓** переместит курсор в следующую ячейку, **↑** + **←** — переместить курсор в предыдущую ячейку.

Для изменения таблицы воспользуйтесь меню Таблица или панелью инструментов Таблица.

## 4.6 LibreOffice Calc

Calc — это приложение LibreOffice для работы с табличными данными, а также построения графиков и диаграмм. Электронные таблицы содержат несколько листов, включающих ячейки, которые могут быть заполнены такими элементами, как текст, числа или формулы. С помощью формул можно манипулировать данными из других ячеек для генерации значения в заданной ячейке, в которую они были внесены. Calc позволяет систематизировать, фильтровать и сортировать данные или создавать из их основе графики для графического представления. Используя DataPilotс можно комбинировать, анализировать и сравнивать большие массивы данных.

Как и весь комплект LibreOffice приложение Calc может быть использовано на множестве программных платформ. Приложение поддерживает большое количество форматов для обмена (включая экспорт в PDF), а также может читать и сохранять файлы в формате Microsoft Excel.



### 4.6.1 Создание нового документа

Запустите LibreOffice и выберите **Файл > Создать > Электронную таблицу** для создания нового документа. Каждый лист доступен по нажатию на соответствующей вкладке внизу окна.

Вводите данные в требуемые ячейки таблицы. Для изменения внешнего вида или стиля, используйте панель инструментов **Форматирование** или меню **Формат**. Воспользуйтесь меню **Файл** или соответствующей кнопкой на панели инструментов для печати или сохранения документа.

### 4.6.2 Изменение настроек LibreOffice Calc

Для улучшения внешнего вида таблиц и отчетов, Calc поставляется со встроенными стилями ячеек и листов. Несмотря на то, что встроенные стили подходят большинству пользователей, возможно, создание собственных стилей будет более удобным для установки необходимых настроек форматирования.

#### Процедура 4.1 Создание стиля

- 1 Нажмите **Формат > Стили**.
- 2 В окне **Стили и форматирование** нажмите на один из значков: **Стили страницы** или **Стили ячеек**.
- 3 Нажмите правой кнопкой мыши в окне **Стили и форматирование**, затем выберите **Создать**.
- 4 Укажите название нового стиля, и, используя различные вкладки, выберите желаемые настройки форматирования.



- 5 Нажмите ОК.

#### Процедура 4.2 Изменение стиля

- 1 Нажмите Формат > Стили.
- 2 В меню Стили и форматирование нажмите один из значков: Стили страницы или Стили ячейки.
- 3 Нажмите правой кнопкой мыши на названии стиля, который необходимо изменить, затем нажмите Изменить....
- 4 Измените существующие настройки форматирования.
- 5 Нажмите ОК.

## 4.7 Другие приложения LibreOffice

Кроме Writer и Calc, LibreOffice также включает такие модули как Impress, Base, Draw и Math. С помощью этих приложений можно создавать презентации, проектировать базы данных, рисовать создавать векторные изображения и диаграммы, формировать математические выражения.

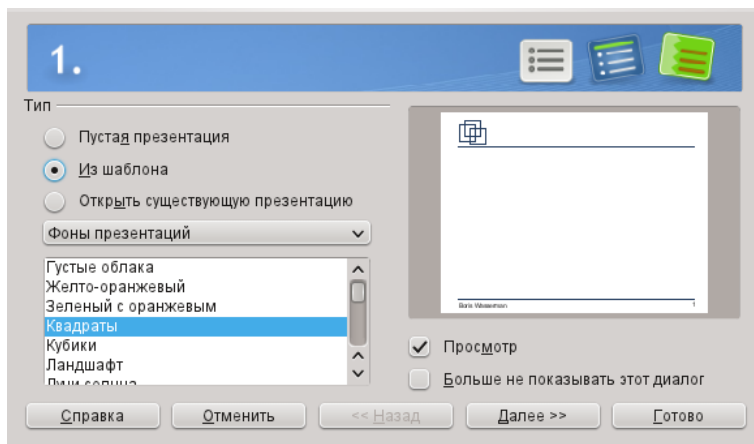
### 4.7.1 Работа с презентациями в Impress

Приложение LibreOffice Impress применяется для создания презентационных материалов как слайд-шоу или отдельные слайды. Если ранее использовалось другое приложение для создания презентаций, то можно легко начать работать с Impress, так как оно функционирует очень похоже на другие программы создания презентаций.

Impress может открывать и сохранять презентации созданные в Microsoft PowerPoint, то есть возможен обмен документами с пользователями PowerPoint, также как и хранение файлов в формате PowerPoint.

LibreOffice Impress также позволяет использование 3D-переходов в слайдах. Доступ к доступным эффектам можно получить, выбрав Демонстрация > Эффекты.

Можно создать совершенно новую презентацию (без каких-либо предварительно отформатированных слайдов) или использовать существующие шаблон или презентацию. Impress использует стили и шаблоны таким-же образом, как и другие приложения LibreOffice. Мастер проведет вас через опции, доступных при создании новой презентации.



## 4.7.2 Работа с базами данных в Base

В состав LibreOffice входит модуль для работы с базами данных — Base. Он используется для создания баз данных, хранящих в себе много разных видов информации: от простой адресной книги или рецептов, до сложных систем управления документами.

Таблицы, формы, запросы и отчёты могут быть созданы вручную или с помощью удобных мастеров. Например, мастер таблиц содержит множество типовых полей для делового или персонального использования. С помощью такого мастера можно пошагово создать новую базы данных.

LibreOffice Base поставляется с несколькими предопределёнными полями базы данных, облегчающих создание базы данных. Мастер помогает поэтапно создать новую базу данных. Следующие шаги специфичны для создания адресной книги, используются предопределённые поля, но также легко использовать стандартные поля из предложенных образцов таблиц. Процесс создания базы данных можно разбить на несколько отдельных под-процессов:

### Процедура 4.3 Создание базы данных

- 1 Нажмите **Файл > Создать > Базу данных**.
- 2 Выберите **Создать новую базу данных** и нажмите **Далее**.
- 3 Нажмите **Да, зарегистрировать базу данных**, чтобы информация о создаваемой базе данных была доступна другим модулям LibreOffice, отметьте оба флажка в нижней половине окна и нажмите **Готово**.
- 4 Выберите директорию в которой будет размещен файл базы данных, укажите его имя, затем нажмите **Сохранить**.

#### Процедура 4.4 Создание таблицы базы данных

- 1 В окне Мастер таблиц выберите Персональные.
- 2 Меню Примеры таблиц содержит список стандартных таблиц для персонального использования. При выборе Деловые, список будет содержать предустановленные деловые таблицы.

В списке Примеры таблиц выберите Адреса. Возможные поля для стандартной адресной книги появятся в меню Переменные поля.

- 3 В меню Переменные поля выберите желаемые поля которые вы хотите использовать в адресной книге.

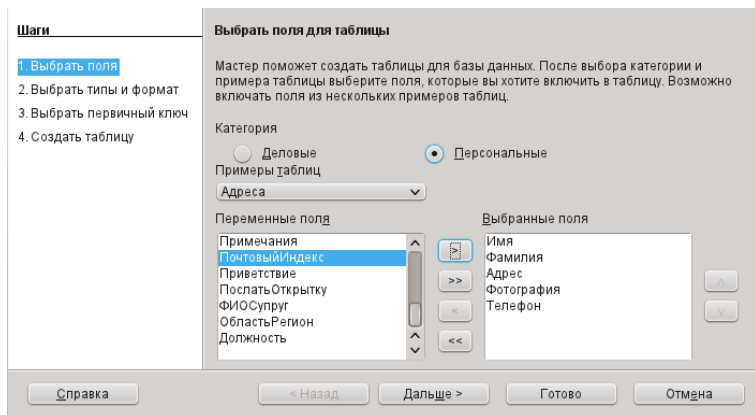
Можно выбрать каждый объект по отдельности или сразу несколько удерживая [].

- 4 Нажать кнопку с одиночной стрелкой для перемещения выбранных полей в меню Выбранные поля.

Для перемещения всех возможных полей в меню Выбранные поля нажмите на кнопку с двойной стрелкой.

- 5 Используйте кнопки со стрелками для размещения выбранных полей в требуемом порядке и нажмите Готово.

Поля будут помещены в таблице и на формах в указанном порядке.



#### 4.7.3 Создание рисунка в Draw

Используйте LibreOffice Draw для создания рисунков и диаграмм. Можно сохранить Вашу работу в наиболее распространенных на данный момент форматах

и импортировать ее в любом приложении поддерживающем данную операцию, включая другие модули LibreOffice. Также можно создать Flash-версию векторного изображения.

LibreOffice поддерживает импорт масштабируемых векторных изображений (Scalable Vector Graphics, \*.svg) и WordPerfect Graphics (\*.wpg). Выберите Файл > Открыть и в выпадающем списке Фильтр выберите нужный формат.

#### Процедура 4.5 Создание рисунка

- 1 Нажмите  $\square$  + [F2] и введите `oodraw`, чтобы запустить LibreOffice Draw.
- 2 Используйте элементы меню внизу окна для создания рисунка.
- 3 Сохраните рисунок.

Для вставки существующего рисунка Draw в документ LibreOffice выберите Вставка > Объект > Объект OLE. Выберите Создать из файла и нажмите Обзор, чтобы выбрать нужный файл. При вставке файла как OLE-объекта можно легко его отредактировать дважды нажав на нем.

#### Процедура 4.6 Использование функций Draw в других приложениях LibreOffice

Одной из особенностей использования Draw является возможность использования его функций в других модулях LibreOffice, что позволяет создавать рисунки, автоматически встраиваемые в документ.

- 1 Выберите в приложении LibreOffice (например, Writer) Вставка > Объект > Объект OLE... > Рисунок LibreOffice 3.3 > ОК. Откроется окно Draw.
- 2 Создайте рисунок.
- 3 Поместите курс в документе за пределами рамки Draw.

Рисунок будет автоматически вставлен в документ.

### 4.7.4 Создание математических выражений с помощью Math

Обычно включение комплексных математических формул в документ является нетривиальной задачей. LibreOffice Math — редактор математических выражений, который позволяет создавать формулы содержащие операторы, функции и указания по форматированию. Можно сохранить эти формулы как объекты, которые могут быть импортированы в другие документы LibreOffice, как любые другие графические объекты.

Используя Math можно создавать уравнения и формулы тремя различными способами:

- Введя разметку в редактор формул,

- нажав правой кнопкой мыши в редакторе формул и выбрав символ из контекстного меню
- или
- выбрав его в окне Элементы.

---

#### ПРИМЕЧАНИЕ

Math — не калькулятор. Выражения которые в нем создаются являются графическими объектами. Даже, если они были импортированы в Calc — по ним невозможно произвести какие-либо вычисления.

---

## 4.8 Дополнительная информация

LibreOffice содержит обширную справочную информацию доступную в Интернет. Её сопровождает многочисленное сообщество пользователей и разработчиков. Для получения дополнительной информации перейдите по следующей ссылке:

<http://www.libreoffice.org/download/3-4-new-features-and-fixes/>

Список всех нововведений и улучшений LibreOffice.

<http://www.libreoffice.org/get-help/documentation/>

Официальная страница поддержки LibreOffice, содержащая руководства и другую документацию.

<http://www.taming-openoffice-org.com/>

Приручение LibreOffice: книги, новости, советы и хитрости.



## Часть II. Управление программным обеспечением





## 5 Installing or Removing Software

Use YaST's software management tool to search for software components you want to add or remove. YaST resolves all dependencies for you. To install packages not shipped with the installation media, add additional software repositories to your setup and let YaST manage them. Keep your system up-to-date by managing software updates with the update applet.

Change the software collection of your system with YaST Software Manager. This YaST module is available in three toolkit flavors: Qt (for KDE desktops), GTK+ (for GNOME desktops), and ncurses (providing a pseudo-graphical user interface in text mode). This chapter describes Qt and GTK+ flavors—for details on the ncurses YaST, see [Глава 12, YaST in Text Mode](#) (стр. 151).

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### ПОДСКАЗКА: Changing the Toolkit Flavor

By default, YaST is started with the toolkit matching your desktop (GTK+ under GNOME, Qt under KDE). To alter this default setting system-wide, change the variable `WANTED_GUI` in `/etc/sysconfig/yast2` to either `qt` or `gtk`.

If you do not want to change the system-wide settings, you can nevertheless start YaST in the desired flavor from command line by using the `--gtk` or `--qt`. For example: `yast2 --gtk`.

---

### ПРИМЕЧАНИЕ: Confirmation and Review of Changes

When installing, updating or removing packages, any changes in the Software Manager are not applied immediately but only after confirming them with Accept or Apply respectively. YaST maintains a list with all actions, allowing you to review and modify your changes before applying them to the system.

---

## 5.1 Definition of Terms

### Repository

A local or remote directory containing packages, plus additional information about these packages (package meta-data).

### (Repository) Alias

A short name for a repository used by various zypper commands. The alias can be chosen by the user when adding a repository and must be unique.

### Product

Represents a whole product, for example .

### Pattern

A pattern is an installable group of packages dedicated to a certain purpose. For example, the `Laptop` pattern contains all packages that are needed in a mobile computing environment. Patterns define package dependencies (such as required or recommended packages) and come with a preselection of packages marked for installation. This ensures that the most important packages needed for a certain purpose are available on your system after installation of the pattern. However, not necessarily all packages in a pattern are preselected for installation and you can manually select or deselect packages within a pattern according to your needs and wishes.

### Package

A package is a compressed file in `rpm` format that contains the files for a particular program.

### Patch

A patch consists of one or more packages and may be applied by means of `deltarpm`s. It may also introduce dependencies to packages that are not installed yet.

### Resolvable

An generic term for product, pattern, package or patch. The most commonly used type of resolvable is a package or a patch.

### deltarpm

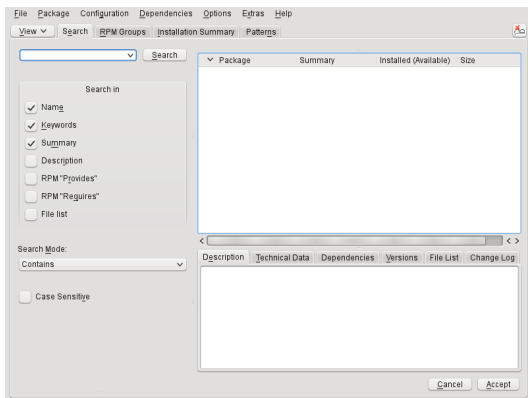
A `deltarpm` consists only of the binary diff between two defined versions of a package, and therefore has the smallest download size. Before being installed, the full RPM package is rebuilt on the local machine.

### Package Dependencies

Certain packages are dependent on other packages, such as shared libraries. In other terms, a package may `require` other packages—if the required packages are not available, the package cannot be installed. In addition to dependencies (package requirements) that must be fulfilled, some packages `recommend` other packages. These recommended packages are only installed if they are actually available, otherwise they are just ignored and the package recommending them is installed nevertheless.

## 5.2 Using the KDE Interface (Qt)

The YaST Qt interface is started by default when using the desktops KDE, `icwm`, and others. It is also used when invoking YaST from a remote terminal. Start the software manager from the YaST Control Center by choosing `Software > Software Management`.



## 5.2.1 Views for Searching Packages or Patterns

The YaST software manager can install packages or patterns from all currently enabled repositories. It offers different views and filters to make it easier to find the software you are searching for. The Search view is the default view of the window. To change view, click View and select one of the following entries from the drop-down list. The selected view opens in a new tab.

### Patterns

Lists all patterns available for installation on your system.

### Package Groups

Lists all packages sorted by groups such as Graphics, Programming, or Security.

### RPM Groups

Lists all packages sorted by functionality with groups and subgroups. For example Networking > Email > Clients.

### Languages

Filter to list all packages needed to add a new system language.

### Repositories

Filter to list packages by repository. In order to select more than one repository, hold the **Ctrl** key while clicking on repository names. The «pseudo repository» @System lists all packages currently installed.

### Search

Lets you search for a package according to certain criteria. Enter a search term and press **Enter**. Refine your search by specifying where to Search In and by changing the Search Mode. For example, if you do not know the package name but only the name of the application that you are searching for, try including the package Description in the search process.

## Installation Summary

If you have already selected packages for installation, update or removal, this view shows the changes that will be applied to your system as soon as you click Accept. To filter for packages with a certain status in this view, activate or deactivate the respective check boxes. Hit ☐ + [F1] for details on the status flags.

---

### ПОДСКАЗКА: Finding Packages not Belonging to an Active Repository

To list all packages that do not belong to an active repository, choose View > Repositories > @System and then choose Secondary Filter > Unmaintained Packages. This is useful, for example, if you have deleted a repository and would like to make sure no packages from that repository remain installed.

---

## 5.2.2 Installing and Removing Packages or Patterns

Certain packages are dependent on other packages, such as shared libraries. On the other hand, some packages cannot coexist with others on the system. If possible, YaST automatically resolves these dependencies or conflicts. If your choice results in a dependency conflict that cannot be automatically solved, you need to solve it manually as described in [Раздел 5.2.4, «Checking Software Dependencies»](#) (стр. 87).

---

### ПРИМЕЧАНИЕ: Removal of Packages

When removing any packages, by default YaST only removes the selected packages. If you want YaST to also remove any other packages that become unneeded after removal of the specified package, select Options > Cleanup when deleting packages.

---

- 1 Search for packages as described in [Раздел 5.2.1, «Views for Searching Packages or Patterns»](#) (стр. 83).
- 2 The packages found are listed in the right pane. To install a package or remove it, right-click it and choose Install or Delete. If the relevant option is not available, check the package status indicated by the symbol in front of the package name —hit ☐ + [F1] for help.

---

### ПОДСКАЗКА: Applying an Action to All Packages Listed

To apply an action to all packages listed in the right pane, choose an action from Package > All in This List.

---

- 3 To install a pattern, right-click the pattern name and choose Install.
- 4 It is not possible to remove a pattern per se. Instead, select the packages of a pattern you want to remove and mark them for removal.
- 5 In order to select more packages, repeat the steps mentioned above.

- 6 Before applying your changes, you can review or modify them by clicking View > Installation Summary. By default, all packages that will change status, are listed.
- 7 In order to revert the status for a package, right-click the package and select one of the following entries: Keep if the package was scheduled to be deleted or updated, or Do Not Install if it was scheduled for installation. To abandon all changes and close the Software Manager, click Cancel and Abandon
- 8 When you are finished, click Accept to apply your changes.
- 9 In case YaST found dependencies on other packages, a list of packages that have additionally been chosen for installation, update or removal is presented. Click Continue to accept them.

After all selected packages are installed, updated or removed, the YaST Software Manager automatically terminates.

---

#### ПРИМЕЧАНИЕ: Installing Source Packages

Installing source packages with YaST Software Manager is not possible at the moment. Use the command line tool `zypper` for this purpose. For more information, see [Раздел 9.1.2.1, «Installing Source Packages»](#) (стр. 115).

---

## 5.2.3 Updating Packages

Instead of updating individual packages, you can also update all installed packages or all packages from a certain repository. When mass updating packages, the following aspects are generally considered:

- priorities of the repositories that provide the package,
- architecture of the package (for example, x86\_64, i686, i586),
- version number of the package,
- package vendor.

Which of the aspects has the highest importance for choosing the update candidates depends on the respective update option you choose.

- 1 To update all installed packages to the latest version, choose Package > All Packages > Update if Newer Version Available from the main menu.

All repositories are checked for possible update candidates, using the following policy: YaST first tries to restrict the search to packages with the same architecture and vendor like the installed one. If the search is positive, the «best» update candidate from those is selected according to the process below. However, if no comparable package of the same vendor can be found, the

search is expanded to all packages with the same architecture. If still no comparable package can be found, all packages are considered and the «best» update candidate is selected according to the following criteria:

1. Repository priority: Prefer the package from the repository with the highest priority.
2. If more than one package results from this selection, choose the one with the «best» architecture (best choice: matching the architecture of the installed one; otherwise:  $x86\_64 > i686 > i586$ ).

If the resulting package has a higher version number than the installed one, the installed package will be updated and replaced with the selected update candidate.

This option tries to avoid changes in architecture and vendor for the installed packages, but under certain circumstances, they are tolerated.

---

**ПРИМЕЧАНИЕ:** Update Unconditionally

If you choose Package > All Packages > Update Unconditionally instead, basically the same criteria apply but candidate package found is installed unconditionally. Thus, choosing this option might actually lead to downgrading some packages.

---

- 2 To make sure that the packages for a mass update derive from a certain repository:
  - 2a Choose the repository from which to update as described in [Раздел 5.2.1, «Views for Searching Packages or Patterns»](#) (стр. 83) .
  - 2b On the right hand side of the window, click Switch system packages to the versions in this repository. This explicitly allows YaST to change the package vendor when replacing the packages.  
  
As soon as you proceed with Accept, all installed packages will be replaced by packages deriving from this repository, if available. This may lead to changes in vendor and architecture and even to downgrading some packages.
  - 2c To refrain from this, click Cancel switching system packages to the versions in this repository. Note that you can only cancel this until you press the Accept button.
- 3 Before applying your changes, you can review or modify them by clicking View > Installation Summary. By default, all packages that will change status, are listed.
- 4 If all options are set according to your wishes, confirm your changes with Accept to start the mass update.

## 5.2.4 Checking Software Dependencies

Most packages are dependent on other packages. If a package, for example, uses a shared library, it is dependent on the package providing this library. On the other hand some packages cannot coexist with each other, causing a conflict (for example, you can only install one mail transfer agent: sendmail or postfix). When installing or removing software, the Software Manager makes sure no dependencies or conflicts remain unsolved to ensure system integrity.

In case there exists only one solution to resolve a dependency or a conflict, it is resolved automatically. Multiple solutions always cause a conflict which needs to be resolved manually. If solving a conflict involves a vendor or architecture change, it also needs to be solved manually. When clicking Accept to apply any changes in the Software Manager, you get an overview of all actions triggered by the automatic resolver which you need to confirm.

By default, dependencies are automatically checked. A check is performed every time you change a package status (for example, by marking a package for installation or removal). This is generally useful, but can become exhausting when manually resolving a dependency conflict. To disable this function, uncheck Dependencies > Autocheck. Manually perform a dependency check with Dependencies > Check Now. A consistency check is always performed when you confirm your selection with Accept.

To review a package's dependencies, right-click it and choose Show Solver Information. A map showing the dependencies opens. Packages that are already installed are displayed in a green frame.

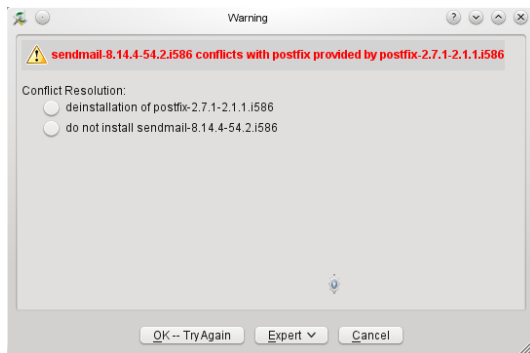
---

### ПРИМЕЧАНИЕ: Manually Solving Package Conflicts

Unless you are very experienced, follow the suggestions YaST makes when handling package conflicts, otherwise you may not be able to resolve them. Keep in mind that every change you make, potentially triggers other conflicts, so you can easily end up with a steadily increasing number of conflicts. In case this happens, Cancel the Software Manager, Abandon all your changes and start again.

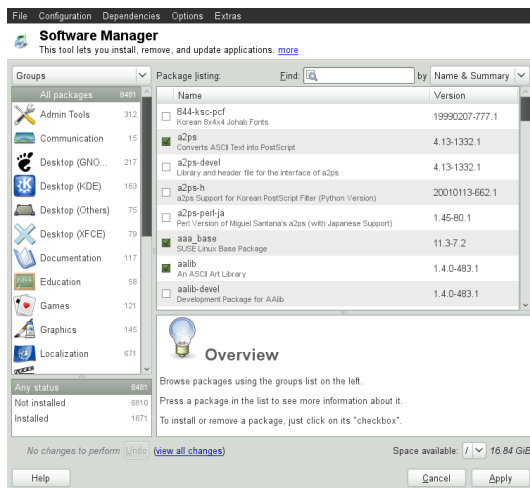
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Рисунок 5.1 Conflict Management of the Software Manager



## 5.3 Using the GNOME Interface (GTK+)

The YaST GTK+ interface is started by default when using the desktops GNOME and XFCE. Start the software manager from the YaST Control Center by clicking Software > Software Management.



### 5.3.1 Views for Searching Packages or Patterns

The easiest way to find a package is to use the search field in the upper right corner of the software manager. Enter a search term and press [Enter]. By default it will search



package names and summaries. Press the search item to change this filter and search the file lists, for example.

The software manager also offers different views and filters for displaying package lists. These are available from the pull-down menu in the upper left corner:

#### Groups

The default view lists all packages sorted by groups such as Admin Tools, Graphics, Programming, or Security.

#### RPM Groups

Lists all packages sorted by functionality with groups and subgroups. For example Networking > Email > Clients.

#### Repositories

Filter to list packages by repository. In order to select more than one repository, hold the ☐ key while clicking on repository names. The «pseudo repository» @System lists all packages currently installed.

To add, edit, or remove available repositories, click Edit Repositories.

#### Patterns

Lists all patterns available for installation on your system.

#### Languages

Filter to list all packages needed to add a new system language.

The box in the lower right corner of the dialog also allows to filter for packages that are Installed, Not Installed or Upgradable. If you select the No Status entry, all available packages from the configured repositories are displayed, independent of their status.

## 5.3.2 Installing and Removing Packages or Patterns

Certain packages are dependent on other packages, such as shared libraries. On the other hand, some packages cannot coexist with others on the system. If possible, YaST automatically resolves these dependencies or conflicts. If your choice results in a dependency conflict that cannot be automatically solved, you need to solve it manually as described in [Раздел 5.2.4, «Checking Software Dependencies»](#) (стр. 87).

- 1 Search for packages as described in [Раздел 5.3.1, «Views for Searching Packages or Patterns»](#) (стр. 88).
- 2 The packages found are listed in the right pane. To further filter the search results according to package status (Any Status, Not Installed, Installed, Upgradable), select one of the entries in the box at the lower left corner of the dialog. For details about a package, click the package in the list. Information like available versions, authors and changelog of the package are displayed in the lower right corner of the window.

To mark a package for installation, re-installation, removal, or upgrade, right-click the package and choose the appropriate action from the menu.

---

#### ПОДСКАЗКА: Applying an Action to All Packages Listed

To apply an action to all packages listed in the right pane, right-click a package, choose Select All, right-click again and choose an action.

---

- 3 To install a pattern, right-click the pattern name and choose Install.
- 4 It is not possible to remove a pattern per se. Instead, select the packages of a pattern you want to remove and mark them for removal.
- 5 In order to select more packages, repeat the steps mentioned above.
- 6 Before applying your changes, you can review or modify them by clicking View All Changes at the bottom of the dialog. By default, all packages that will change status are listed.
- 7 To revert changes for a package, click the Undo icon with the yellow arrow. To finish the review, click Close.
- 8 When you are finished with the selection of packages to install or remove, Apply your changes.
- 9 In case YaST found dependencies on other packages, a list of packages that have additionally been chosen for installation, update or removal is presented. Click Apply to accept them.

After all selected packages are installed, updated or removed, the YaST Software Manager automatically terminates.

---

#### ПРИМЕЧАНИЕ: Installing Source Packages

Installing source packages with YaST Software Manager is not possible at the moment. Use the command line tool `zypper` for this purpose. For more information, see [Раздел 9.1.2.1, «Installing Source Packages»](#) (стр. 115).

---

### 5.3.3 Updating Packages

Instead of updating individual packages, you can also update all installed packages or all packages from a certain repository. When mass updating packages, the following aspects are generally considered:

- priorities of the repositories that provide the package,
- architecture of the package (for example, x86\_64, i686, i586),
- version number of the package,
- package vendor.

Which of the aspects has the highest importance for choosing the update candidates depends on the respective update option you choose.

- 1 To view the list of packages that can be updated (packages with higher versions are available), select Upgradable in the bottom left box.
- 2 To update all packages listed there, click Upgrade All.

To install only upgradable packages for which an official patch has been issued, click Upgrade Patches. Those packages are marked by a patch tag next to their version number. Choosing this option is equivalent to doing an online update with YaST as described in [Глава 6, YaST Online Update](#) (стр. 101).

If no patches have been issued since last applying patches, the button is disabled.

- 3 To make sure that the packages for a mass update derive from a certain repository:
  - 3a Choose the repository from which to update as described in [Раздел 5.3.1, «Views for Searching Packages or Patterns»](#) (стр. 88) .
  - 3b On the right hand side of the window, click Switch system packages to the versions in this repository. This explicitly allows YaST to change the package vendor when replacing the packages.

All installed packages will be replaced by packages deriving from this repository, if available. This may lead to changes in vendor and architecture and even to downgrading some packages.
- 4 Before applying the changes, you can review or modify them by clicking View All Changes at the bottom of the dialog. By default, all packages that will change status are listed.
- 5 To refrain from switching the system packages to the versions in this repository, click the Undo button next to the respective option.
- 6 If all options are set according to your wishes, confirm your changes with Apply to start the mass update.

## 5.3.4 Checking Software Dependencies

Most packages are dependent on other packages. If a package, for example, uses a shared library, it will be dependent on the package providing this library. On the other hand, some packages cannot coexist with each other, causing a conflict (for example, you can only install one mail transfer agent: sendmail or postfix). When installing or removing software, the Software Manager makes sure no dependencies or conflicts remain unresolved to ensure system integrity.

In case there exists only one solution to resolve a dependency or a conflict, it is resolved automatically. Multiple solutions always cause a conflict which needs to be resolved manually. If solving a conflict involves a vendor or architecture change, it also needs to be solved manually. When clicking Apply to apply any changes in the Software Manager, you get an overview of all actions triggered by the automatic resolver which you need to confirm.

By default, dependencies are automatically checked. A check is performed every time you change a package status (for example, by marking a package for installation or removal). This is generally useful, but can become exhausting when manually resolving a dependency conflict. To disable this function, uncheck Dependencies > Autocheck. Manually perform a dependency check with Dependencies > Check Now. A consistency check is always performed when you confirm your selection with Apply.

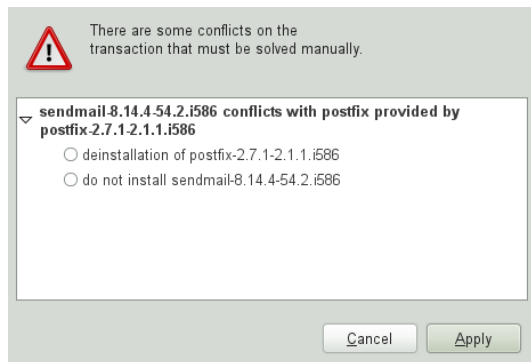
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#### ПРИМЕЧАНИЕ: Manually Solving Package Conflicts

Unless you are very experienced, follow the suggestions YaST makes when handling package conflicts, otherwise you may not be able to resolve them. Keep in mind that every change you make, potentially triggers other conflicts, so you can easily end up with a steadily increasing number of conflicts. In case this happens, click Cancel and Quit the software manager. Relaunch it to start again.

---

Рисунок 5.2 Conflict Management of the Software Manager



## 5.4 Managing Software Repositories and Services

If you want to install third-party software, add additional software repositories to your system. By default, the product repositories such as -DVD and a matching update repository are automatically configured during the installation. Depending on the initially selected product, a separate language add-on repository with translations, dictionaries, etc. might also be configured.

To manage repositories, start YaST and select Software > Software Repositories. The Configured Software Repositories dialog opens. Here, you can also manage subscriptions to so-called Services by changing the View at the right corner of the dialog to All Services. A Service in this context is a Repository Index Service (RIS) that can offer one or more software repositories. Such a Service can be changed dynamically by its administrator or vendor.

Each repository provides files describing content of the repository (package names, versions, etc.). These repository description files are downloaded to a local cache that

is used by YaST. To ensure their integrity, software repositories can be signed with the GPG Key of the repository maintainer. Whenever you add a new repository, YaST offers the ability to import its key.

---

#### ПРЕДУПРЕЖДЕНИЕ: Trusting External Software Sources

Before adding external software repositories to your list of repositories, make sure this repository can be trusted. is not responsible for any potential problems arising from software installed from third-party software repositories.

---

### 5.4.1 Adding Software Repositories

You can either add repositories from a local harddisk, from a removable medium (like a CD, DVD or a USB mass storage) or from a network.

To add repositories from the Configured Software Repositories dialog in YaST proceed as follows:

- 1 Click Add.
- 2 From the list of available Media Types specify the type matching your repository:

For network sources, it is usually sufficient to use the default option, Specify URL.

To add a repository from a removable medium or a local harddisk, choose the relevant option and insert the medium or connect the USB device to the machine, respectively.

- 3 You can choose to Download Repository Description Files now. If the option is unchecked, YaST will automatically download the files later, if needed. Click Next to proceed.
- 4 When adding a repository from the network, enter the data you are prompted for. Continue with Next.
- 5 Depending on the repository you have added, you might be asked if you want to import the GPG key with which it is signed or asked to agree to a license.

After confirming these messages, YaST will download and parse the metadata and add the repository to the list of Configured Repositories..

- 6 If needed, adjust the repository Properties as described in [Раздел 5.4.2, «Managing Repository Properties»](#) (стр. 94) or confirm your changes with OK to close the configuration dialog.

Now you can install software from this repository as described in [Раздел 5.2, «Using the KDE Interface \(Qt\)»](#) (стр. 82) or in [Раздел 5.3, «Using the GNOME Interface \(GTK+\)»](#) (стр. 88).

YaST also offers a list of predefined popular repositories available under Community Repositories. Among others, it includes driver repositories for nVidia and ATI graphics

cards, and popular projects from the openSUSE® Build Service, such as the Mozilla repository (containing packages with the most recent versions of Firefox and Thunderbird).

### Процедура 5.1 Configuring Community Repositories

- 1 Start YaST and select Software > Software Repositories.
- 2 Click Add.
- 3 Choose Community Repositories and proceed with Next.
- 4 From the preconfigured list of repositories choose the ones you want to add by ticking the respective check boxes. The Mozilla repository, for example, is listed as openSUSE BuildService - Mozilla.

Confirm with OK.

- 5 Accept to Import the GnuPG key. You need to import a key for each repository you have chosen.
- 6 The new software repositories are now listed in the Configured Software Repositories overview. Click OK to leave the software repositories configuration.

## 5.4.2 Managing Repository Properties

The Configured Software Repositories overview of the Software Repositories lets you change the following repository properties:

### Status

The repository status can either be Enabled or Disabled. You can only install packages from repositories that are enabled. To turn a repository off temporarily click Disable. You can also double-click on a repository name to toggle its status. If you want to remove a repository completely, click Delete.

### Refresh

When refreshing a repository, its content description (package names, versions, etc.) is downloaded to a local cache that is used by YaST. It is sufficient to do this once for static repositories such as CDs or DVDs, whereas repositories whose content changes often should be refreshed frequently. The easiest way to keep a repository's cache up-to-date is to choose Automatically Refresh. To do a manual refresh click Refresh and select one of the options.

### Keep Downloaded Packages

Packages from remote repositories are downloaded before being installed. By default, they are deleted upon a successful installation. Activating Keep Downloaded Packages prevents the deletion of downloaded packages. The download location is configured in `/etc/zypp/zypp.conf`, by default it is `/var/cache/zypp/packages`.

## Priority

The Priority of a repository is a value between 1 and 200, with 1 being the highest priority and 200 the lowest priority. Any new repositories that are added with YaST get a priority of 99 by default. If you do not care about a priority value for a certain repository, you can also set the value to 0 to apply the default priority to that repository (99). If a package is available in more than one repository, then the repository with the highest priority takes precedence. This is useful if you want to avoid downloading packages unnecessarily from the Internet by giving a local repository (for example, a DVD) a higher priority.

---

### BAKHO: Priority vs. Version

The repository with the highest priority takes precedence in any case. Therefore, make sure that the update repository always has the highest priority (20 by default), otherwise you might install an outdated version that will not be updated until the next online update.

If you add repositories providing new versions for programs shipped with (for example a repository with the latest KDE or GNOME version), make sure they have a higher priority than the standard repositories, otherwise packages from these repositories will not be installed by default.

---

## Name and URL

To change a repository name or its URL, select it from the list with a single-click and then click Edit.

## 5.4.3 Managing Repository Keys

To ensure their integrity, software repositories can be signed with the GPG Key of the repository maintainer. Whenever you add a new repository, YaST offers to import its key. Verify it as you would do with any other GPG key and make sure it does not change. If you detect a key change, something might be wrong with the repository. Disable the repository as an installation source until you know the cause of the key change.

To manage all imported keys, click GPG Keys... in the Configured Software Repositories dialog. Select an entry with the mouse to show the key properties at the bottom of the window. Add, Edit or Delete keys with a click on the respective buttons.

## 5.5 Keeping the System Up-to-date

openSUSE offers a continuous stream of software security patches for your product. The update applet informs you about the availability of patches and lets you easily install them with just a few clicks.

### 5.5.1 Using the KDE Software Updater

The Software Updater icon resides in the system tray of your panel depicting a gearwheel with a green arrow. To start Software Updater manually, choose

System Settings > SoftwareManagement > Software Updates from the main menu. Alternatively, [] + [F2] and enter `kpk_update`.

---

#### ПРИМЕЧАНИЕ: Icon Visibility

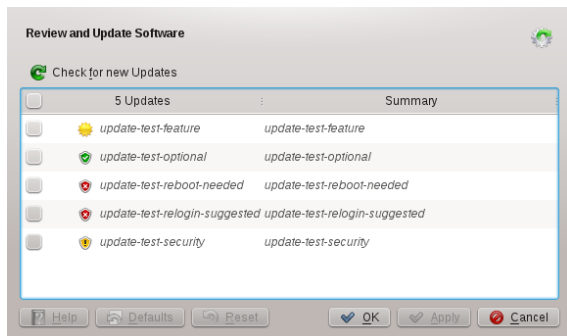
The Software Updater icon is only visible in the system tray, if patches are available. Hover over the icon to see the number of patches available.

---

### 5.5.1.1 Installing Patches

- 1 Whenever software updates are available, the applet icon appears in the panel. Left-click the Software Updater icon to launch the Review and Update software window.
- 2 Select a patch for installation by ticking its checkbox. Get detailed information on a patch by clicking on its title. To select all available patches for installation, tick the checkbox in the table header.
- 3 Click Apply to start the patch installation.
- 4 In case you have started the patch installation for the first time, you will be asked to enter the `root` password twice in order to proceed. If you also check Remember authorization you will never be asked again to provide the password.
- 5 The Additional Changes window showing an installation summary opens. Click Continue to finish the installation.

Рисунок 5.3 KDE Software Updater



The YaST Online Update offers advanced features to customize the patch installation. Please refer to [Глава 6, YaST Online Update](#) (стр. 101) for more information.

### 5.5.1.2 Configuring the KDE Software Updater

By default Software Updater checks for updates every 24 hours, notifies you when patches are available and does not automatically install patches. These settings can be



changed with the Software Management settings. To open the Software Management settings choose System Settings > Software Management > Settings from the main menu. Alternatively, press `Alt + F2` and enter `kpk_settings`. The settings for Software Updater are available in the Update Settings section.

---

#### ВАЖНО: Patch Origin

The Software Management settings also allows you to configure the repositories (Origin of Packages) to be used. This setting not only applies to Software Updater but also to the KDE Software Management module (Get and Remove Software).

Make sure the repository Updates for is always selected—otherwise you will not receive patches.

---

## 5.5.2 Using the GNOME Update Applet

The update applet resides in the notification area of the panel. Its icon changes depending on the availability and relevance of patches and the status of the update. To invoke the applet manually, choose Computer > More Applications > System > Software Update.

---

#### ПРИМЕЧАНИЕ: Icon visibility

By default, the update applet icon is only visible in the notification area, if patches are available.

---

#### Open box with a globe

The update applet is busy (for example checking for updates or installing software).

#### Red Star with Exclamation Mark

Security patches are available.

#### Orange Star with an Up Arrow

Important patches are available.

#### Yellow Star with a Down Arrow

Trivial patches are available.

#### Yellow Triangle with Exclamation Mark

An error has occurred.

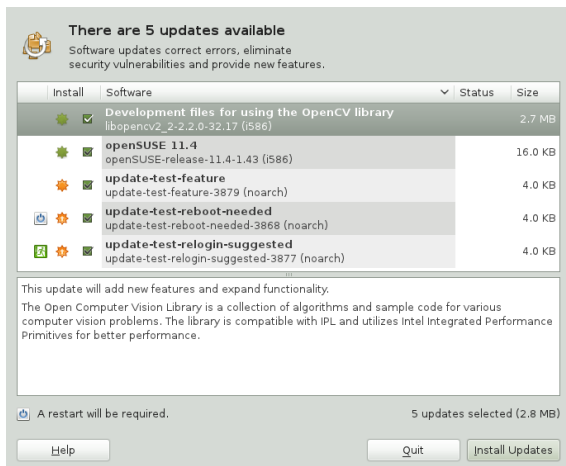
### 5.5.2.1 Installing Patches

#### Процедура 5.2 Installing Patches

- 1 Whenever new patches are available, a notification message will appear and the Update Applet icon will be visible in the notification area. Either click Install updates in the notification message or click the icon to open the Software Update window.

- 2 All security and important patches are preselected. It is strongly recommended to install these patches. Trivial patches can be manually selected by ticking the respective check boxes. Get detailed information on a patch by clicking on its title.
- 3 Click Install Updates to start the patch installation.
- 4 The Additional Confirmation Required window showing an installation summary opens. Click Continue to proceed.
- 5 Enter the `root` password in the authentication screen and proceed with Authenticate.

Рисунок 5.4 GNOME Update Applet



The YaST Online Update offers advanced features to customize the patch installation. Please refer to [Глава 6, YaST Online Update](#) (стр. 101) for more information.

### 5.5.2.2 Configuring the Software Update Applet

To configure the update applet, right-click the update icon in the panel and choose Preferences. The configuration dialog lets you modify the following settings:

#### Check for Updates

Choose how often a check for updates is performed: Hourly, Daily, Weekly, or Never.

#### Automatically Install

Configure whether patches are installed automatically or not (default). Automatic installation can be chosen for either security patches only or for all patches.

### Check for Major Upgrades

Choose how often a check for major upgrades is performed: Daily, Weekly, or Never.

### Check for updates when using mobile broadband

This configuration option is only available on mobile computers. Turned off by default.

More options are configurable using `gconf-editor: apps > gnome-packagekit`.



## 6 YaST Online Update

openSUSE offers a continuous stream of software security updates for your product. By default, the update applet is used to keep your system up-to-date. Refer to [Раздел 5.5, «Keeping the System Up-to-date»](#) (стр. 95) for further information on the update applet. This chapter covers the alternative tool for updating software packages: YaST Online Update.

The current patches for are available from an update software repository, which is automatically configured during the installation. Alternatively, you can manually add an update repository from a source you trust. To add or remove repositories, start the Repository Manager with **Software > Software Repositories** in YaST. Learn more about the Repository Manager in [Раздел 5.4, «Managing Software Repositories and Services»](#) (стр. 92).

openSUSE provides updates with different relevance levels:

### Security Updates

Fix severe security hazards and should definitely be installed.

### Recommended Updates

Fix issues that could compromise your computer.

### Optional Updates

Fix non-security relevant issues or provide enhancements.

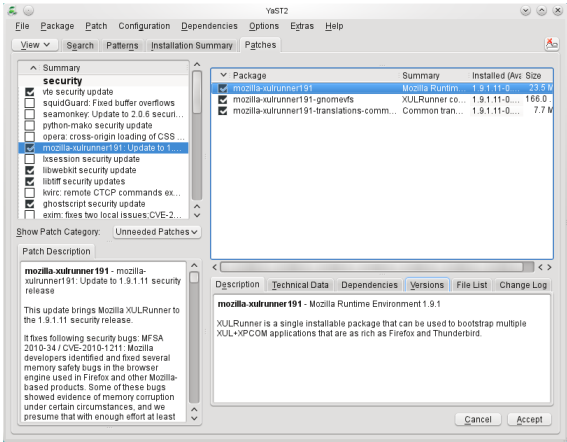
## 6.1 The Online Update Dialog

The YaST Online Update dialog is available in two toolkit flavors: GTK (for GNOME) and Qt (for KDE). Both interfaces differ in look and feel but basically provide the same functions. The following sections provide a brief description of each. To open the dialog, start YaST and select **Software > Online Update**. Alternatively, start it from the command line with `yast2 online_update`.

### 6.1.1 KDE Interface (Qt)

The Online Update window consists of four sections.

Рисунок 6.1 YaST Online Update—Qt Interface



The Summary section on the left lists the available patches for . The patches are sorted by security relevance: `security`, `recommended`, and `optional`. You can change the view of the Summary section by selecting one of the following options from Show Patch Category:

**Needed Patches (default view)**

Non-installed patches that apply to packages installed on your system.

**Unneeded Patches**

Patches that either apply to packages not installed on your system, or patches that have requirements which have already have been fulfilled (because the relevant packages have already been updated from another source).

**All Patches**

All patches available for .

Each list entry in the Summary section consists of a symbol and the patch name. For an overview of the possible symbols and their meaning, press `[?] + [F1]`. Actions required by `Security` and `Recommended` patches are automatically preset. These actions are `Autoinstall`, `Autoupdate` and `Autodelete`.

If you install an up-to-date package from a repository other than the update repository, the requirements of a patch for this package may be fulfilled with this installation. In this case a check mark is displayed in front of the patch summary. The patch will be visible in the list until you mark it for installation. This will in fact not install the patch (because the package already is up-to-date), but mark the patch as having been installed.

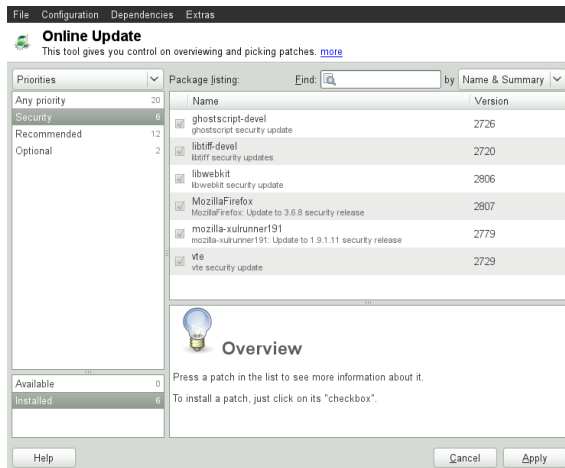
Select an entry in the Summary section to view a short Patch Description at the bottom left corner of the dialog. The upper right section lists the packages included in the

selected patch (a patch can consist of several packages). Click an entry in the upper right section to view details about the respective package that is included in the patch.

## 6.1.2 GNOME Interface (GTK)

The Online Update window consists of four main sections.

Рисунок 6.2 YaST Online Update—GTK Interface



The upper right section lists the available (or already installed) patches for . To filter patches according to their security relevance, click the corresponding Priority entry in the upper right section of the window: *Security*, *Recommended*, *Optional* or *Any priority*.

If all available patches are already installed, the Package listing in the upper right section will show no entries. The box in the bottom left-hand section shows the number of both available and already installed patches and lets you toggle the view to either Available or Installed patches.

Select an entry in the Package listing section to view a patch description and further details at the bottom right corner of the dialog. As a patch can consist of several packages, click the Applies to entry in the lower right section to see which packages are included in the respective patch.

Click on a patch entry to open a row with detailed information about the patch in the bottom of the window. Here you can see a detailed patch description as well as the versions available. You can also choose to Install optional patches—security and recommended patches are already preselected for installation.

## 6.2 Installing Patches

The YaST Online Update dialog allows you to either install all available patches at one go or to manually select the patches that you want to apply to your system. You may also revert patches that have been applied to the system.

By default, all new patches (except the `optional` ones) that are currently available for your system are already marked for installation. They will be applied automatically once you click Accept or Apply.

### Процедура 6.1 Applying Patches with YaST Online Update

- 1 Start YaST and select Software > Online Update.
  - 2 To automatically apply all new patches (except the `optional` ones) that are currently available for your system, proceed with Apply or Accept to start the installation of the preselected patches.
  - 3 To first modify the selection of patches that you want to apply:
    - 3a Use the respective filters and views the GTK and Qt interfaces provide. For details, refer to [Раздел 6.1.1, «KDE Interface \(Qt\)»](#) (стр. 101) and [Раздел 6.1.2, «GNOME Interface \(GTK\)»](#) (стр. 103).
    - 3b Select or deselect patches according to your needs and wishes by activating or deactivating the respective checkbox (GNOME) or by right-clicking the patch and choosing the respective action from the context menu (KDE).

---

**ВАЖНО:** Always Apply Security Updates

However, do not deselect any `security`-related patches if you do not have a very good reason for doing so. They fix severe security hazards and prevent your system from exploits.

---

  - 3c Most patches include updates for several packages. If you want to change actions for single packages, right-click a package in the package view and choose an action (KDE).
  - 3d To confirm your selection and to apply the selected patches, proceed with Apply or Accept.
- 4 After the installation is complete, click Finish to leave the YaST Online Update. Your system is now up-to-date.

---

### ПОДСКАЗКА: Disabling deltarpm's

By default updates are downloaded as deltarpm's. Since rebuilding rpm packages from deltarpm's is a memory and CPU time consuming task, certain setups or



hardware configurations might require you to disable the usage of `deltarpm`s for performance sake.

To disable the use of `deltarpm`s edit the file `/etc/zypp/zypp.conf` and set `download.use_deltarpm` to `false`.

---

## 6.3 Automatic Online Update

YaST also offers the possibility to set up an automatic update with daily, weekly or monthly schedule. To use the respective module, you need to install the `yast2-online-update-configuration` package first.

### Процедура 6.2 Configuring the Automatic Online Update

- 1 After installation, start YaST and select Software > Online Update Configuration.

Alternatively, start the module with `yast2 online_update_configuration` from the command line.

- 2 Activate Automatic Online Update.

- 3 Choose whether to update Daily, Weekly, or Monthly.

Some patches, such as kernel updates or packages requiring license agreements, require user interaction, which would cause the automatic update procedure to stop.

- 4 To automatically accept any license agreements, activate Agree with Licenses.
- 5 Select if you also want to Skip Interactive Patches in case you want the update procedure to proceed fully automatically.

---

#### ВАЖНО: Skipping Patches

If you select to skip any packages that require interaction, run a manual Online Update from time to time in order to install those patches, too. Otherwise you might miss important patches.

---

- 6 Confirm your configuration with OK.



## 7 Установка пакетов программного обеспечения из Интернет

По умолчанию, установить пакеты возможно только из включенных и сконфигурированных репозиториях. Кроме официальных репозиториях, которые были сконфигурированы во время установки, существует большое число сторонних репозиториях. В Open Build Service находится несколько сотен сторонних репозиториях, смотрите [http://ru.opensuse.org/Дополнительные\\_репозитории](http://ru.opensuse.org/Дополнительные_репозитории).

предлагает два легких способа установки программ из этих репозиториях без необходимости предварительной настройки. Метод 1-Click Install позволяет устанавливать пакеты непосредственно в Веб-браузере, в то же время встроенный в YaST поиск пакетов позволяет задействовать почти все известные репозитории для . Вы можете тут же установить любой пакет найденный в этом модуле.

---

**ПРЕДУПРЕЖДЕНИЕ:** Доверие внешние источники программного обеспечения

Прежде, чем установить какой-либо пакет из внешнего репозитория, удостоверьтесь, что ему можно доверять. не несет ответственности за любые потенциальные проблемы, являющиеся результатом установки программного обеспечения из сторонних репозиториях.

---

### 7.1 1-Click Install

Installation using 1-Click Install is available from a lot of repositories available on Web interfaces. A very popular interface is the openSUSE Build Service software search.

Процедура 7.1 Installing Packages from the openSUSE Build Service via 1-Click Install

- 1 Start the openSUSE Build Service search interface at <http://software.opensuse.org/search>.
- 2 Select your system version from the drop-down menu, for example .
- 3 Enter the name of the package you want to install, for example the OpenStreetMap editor `josc`.
- 4 To refine the search, adjust the Search Options according to your wishes.
- 5 Click Search.
- 6 From the results list select the preferred item by clicking its 1-Click Install button.

- 7 In the Web browser's download dialog, select to open the file with the YaST Meta Package Handler.

The 1-click installer opens the Additional Software Repositories dialog. It shows the repositories providing the packages you want to install per 1-Click Install. They are activated per default. To proceed with the installation, keep the repository selection. By default, you remain subscribed to these repositories after the installation has finished and you will receive updates from them in the future.

- 8 If you want to use the new repositories only once instead, uncheck Remain Subscribed to These Repositories after Installation. Click Next to proceed.
- 9 Now select the software packages that should be installed. Normally there is no need to change the default selection. Click Next to proceed.
- 10 The Proposal screen summarizes the choices you made. Click Customize to restart the configuration steps from above. Click Next and Yes to proceed with the installation.
- 11 Enter the `root` password to start the installation. In case a new repository has been added you also need to confirm the import of the repository's GnuPG key. During the installation several progress pop-ups appear that do not need any interaction. After reading the «Installation was successful» message, click Finish.

---

#### ПОДСКАЗКА: Disabling 1-Click Install Feature

If you want to disable the 1-Click install feature, uninstall the `yast2-metapackage-handler` package using YaST. Alternatively, enter the following command as `root`:

```
rpm -e yast2-metapackage-handler
```

---

## 7.2 YaST Package Search

Provided you are connected to the internet, you can also search and install packages from almost all known repositories for directly via YaST's Package Search. This module is a YaST frontend for the Webpin package search available at <http://packages.opensuse-community.org/>. The YaST module is not available by default—you need to install the package `yast2-packager-webpin` first.

#### Процедура 7.2 Installing Packages Using the YaST Package Search

- 1 Start the Package Search from the YaST Control Center via Software > Package Search.
- 2 Search for a software package by entering its name into the Search Expression field and clicking Search.

- 3 The search result is listed on the Found Packages tab. Click on a package name to see the repository URL, the package version number and the architecture in the Package Description pane.

---

**ПРЕДУПРЕЖДЕНИЕ: Double Check the Package Information**

Make sure to double check whether the software is hosted on a repository you trust before you install it. Also check if the architecture complies with your system (x86\_64 packages can only be installed on 64bit systems).

---

- 4 Mark a package for installation by activating its checkbox. You can mark several packages at once. You can even start a new search for other packages without losing your current selection, which is always available on the All Selected Packages. Once you have finished the package selection, proceed with Next.

The Additional Software Repositories dialog shows the repositories providing the packages you want to install. They are activated per default. To proceed with the installation, keep the repository selection. By default, you remain subscribed to these repositories after the installation has finished, so you will receive updates from them in the future.

- 5 If instead you want to use the new repositories only once, uncheck Remain Subscribed to These Repositories after Installation. Click Next to proceed.
- 6 Now select the software packages that should be installed. Normally there is no need to change the default selection. Click Next to proceed.
- 7 The Proposal screen summarizes the choices you made. Click Customize to restart the configuration steps from above. Click Next and Yes to proceed with the installation.
- 8 Confirm the next dialog. In case a new repository is used, you will also need to confirm the import of the repository's GnuPG key. During the installation several progress pop-ups appear that do not need any interaction. After reading the «Installation was successful» message, click Finish.



## 8 Installing Add-On Products

Add-on products are system extensions. You can install a third party add-on product or a special system extension of (for example, a CD with support for additional languages or a CD with binary drivers). To install a new add-on, start YaST and select **Software > Add-On Products**. You can select various types of product media, like CD, FTP, USB mass storage devices (such as USB flash drives or disks) or a local directory. You can work also directly with ISO files. To add an add-on as ISO file media, select **Local ISO Image** then enter the **Path to ISO Image**. The **Repository Name** is arbitrary.

### 8.1 Add-Ons

To install a new add-on, proceed as follows:

- 1 In YaST select **Software > Add-On Products** to see an overview of already installed add-on products.
- 2 To install a new add-on product, click **Add**.
- 3 From the list of available **Media Types** specify the type matching your repository.
- 4 To add a repository from a removable medium, choose the relevant option and insert the medium or connect the USB device to the machine, respectively.
- 5 You can choose to **Download Repository Description Files now**. If the option is unchecked, YaST will automatically download the files later, if needed. Click **Next** to proceed.
- 6 When adding a repository from the network, enter the data you are prompted for. Continue with **Next**.
- 7 Depending on the repository you have added, you may be asked if you want to import the GPG key with which it is signed or asked to agree to a license.

After confirming these messages, YaST will download and parse the metadata and add the repository to the list of **Configured Repositories**..

- 8 If needed, adjust the repository **Properties** as described in [Раздел 5.4.2, «Managing Repository Properties»](#) (стр. 94) or confirm your changes with **OK** to close the configuration dialog.
- 9 After having successfully added the repository for the add-on media, the software manager starts and you can install packages. Refer to [Глава 5, Installing or Removing Software](#) (стр. 81) for details.

### 8.2 Binary Drivers

Some hardware needs binary-only drivers to function properly. If you have such hardware, refer to the release notes for more information about availability of binary drivers for your system. To read the release notes, open YaST and select Miscellaneous > Release Notes.



## 9 Managing Software with Command Line Tools

This chapter describes Zypper and RPM, two command line tools for managing software. For a definition of the terminology used in this context (for example, repository, patch, or update) refer to [Раздел 5.1, «Definition of Terms»](#) (стр. 81).

### 9.1 Using Zypper

Zypper is a command line package manager for installing, updating and removing packages as well as for managing repositories. It is especially useful for accomplishing remote software management tasks or managing software from shell scripts.

#### 9.1.1 General Usage

The general syntax of Zypper is:

```
zypper [global-options] command [command-options] [arguments] ...
```

The components enclosed in brackets are not required. The simplest way to execute Zypper is to type its name, followed by a command. For example, to apply all needed patches to the system type:

```
zypper patch
```

Additionally, you can choose from one or more global options by typing them just before the command. For example, `--non-interactive` means running the command without asking anything (automatically applying the default answers):

```
zypper --non-interactive patch
```

To use the options specific to a particular command, type them right after the command. For example, `--auto-agree-with-licenses` means applying all needed patches to the system without asking to confirm any licenses (they will automatically be accepted):

```
zypper patch --auto-agree-with-licenses
```

Some commands require one or more arguments. When using the `install` command, for example, you need to specify which package(s) to install:

```
zypper install mplayer
```

Some options also require an argument. The following command will list all known patterns:

```
zypper search -t pattern
```

You can combine all of the above. For example, the following command will install the `mplayer` and `amarok` packages from the `factory` repository while being verbose:

```
zypper -v install --from factory mplayer amarok
```

The `--from` option makes sure to keep all repositories enabled (for solving any dependencies) while requesting the package from the specified repository.

Most Zypper commands have a `dry-run` option that does a simulation of the given command. It can be used for test purposes.

```
zypper remove --dry-run MozillaFirefox
```

## 9.1.2 Installing and Removing Software with Zypper

To install or remove packages use the following commands:

```
zypper install package_name
zypper remove package_name
```

Zypper knows various ways to address packages for the install and remove commands:

by the exact package name (and version number)

```
zypper install MozillaFirefox

or

zypper install MozillaFirefox-3.5.3
```

by repository alias and package name

```
zypper install mozilla:MozillaFirefox
```

Where `mozilla` is the alias of the repository from which to install.

by package name using wildcards

The following command will install all packages that have names starting with «Moz». Use with care, especially when removing packages.

```
zypper install 'Moz*'
```

by capability

For example, if you would like to install a perl module without knowing the name of the package, capabilities come in handy:

```
zypper install 'perl(Time::ParseDate)'
```

by capability and/or architecture and/or version

Together with a capability you can specify an architecture (such as `i586` or `x86_64`) and/or a version. The version must be preceded by an operator: `<` (lesser than), `<=` (lesser than or equal), `=` (equal), `>=` (greater than or equal), `>` (greater than).

```
zypper install 'firefox.x86_64'
zypper install 'firefox>=3.5.3'
zypper install 'firefox.x86_64>=3.5.3'
```

by path to the RPM file

You can also specify a local or remote path to a package:

```
zypper install /tmp/install/MozillaFirefox.rpm
zypper install http://download.opensuse.org/
repositories/mozilla/SUSE_Factory/x86_64/
MozillaFirefox-3.5.3-1.3.x86_64.rpm
```

To install and remove packages simultaneously use the `+/-` modifiers. To install `emacs` and remove `vim` simultaneously, use:

```
zypper install emacs -vim
```

To remove `emacs` and install `vim` simultaneously, use:

```
zypper remove emacs +vim
```

To prevent the package name starting with the `-` being interpreted as a command option, always use it as the second argument. If this is not possible, precede it with `--`:

```
zypper install -emacs +vim      # Wrong
zypper install vim -emacs       # Correct
zypper install -- -emacs +vim   # same as above
zypper remove emacs +vim       # same as above
```

If (together with a certain package) you automatically want to remove any packages that become unneeded after removing the specified package, use the `--clean-deps` option:

```
rm package_name --clean-deps
```

By default, Zypper asks for a confirmation before installing or removing a selected package, or when a problem occurs. You can override this behavior using the `--non-interactive` option. This option must be given before the actual command (`install`, `remove`, and `patch`) as in the following:

```
zypper --non-interactive install package_name
```

This option allows the use of Zypper in scripts and cron jobs.

---

#### ПРЕДУПРЕЖДЕНИЕ: Do not Remove Mandatory System Packages

Do not remove packages such as `glibc`, `zypper`, `kernel`, or similar packages. These packages are mandatory for the system and, if removed, may cause the system to become unstable or stop working altogether.

---

#### 9.1.2.1 Installing Source Packages

If you want to install the corresponding source package of a package, use:

```
zypper source-install package_name
```

That command will also install the build dependencies of the specified package. If you do not want this, add the switch `-D`. To install only the build dependencies use `-d`.

```
zypper source-install -D package_name # source package only
```

```
zypper source-install -d package_name # build dependencies  
only
```

Of course, this will only work if you have the repository with the source packages enabled in your repository list (it is added by default, but not enabled). See [Раздел 9.1.4, «Managing Repositories with Zypper»](#) (стр. 119) for details on repository management.

A list of all source packages available in your repositories can be obtained with:

```
zypper search -t srcpackage
```

### 9.1.2.2 Utilities

To verify whether all dependencies are still fulfilled and to repair missing dependencies, use:

```
zypper verify
```

In addition to dependencies that must be fulfilled, some packages «recommend» other packages. These recommended packages are only installed if actually available and installable. In case recommended packages were made available after the recommending package has been installed (by adding additional packages or hardware), use the following command:

```
zypper install-new-recommends
```

This command is very useful after plugging in a webcam or WLAN device. It will install drivers for the device and related software, if available. Drivers and related software are only installable if certain hardware dependencies are fulfilled.

## 9.1.3 Updating Software with Zypper

There are three different ways to update software using Zypper: by installing patches, by installing a new version of a package or by updating the entire distribution. The latter is achieved with the `zypper dist-upgrade` command which is discussed in [Раздел 16.1, «Upgrading the System»](#) (стр. 181).

### 9.1.3.1 Installing Patches

To install all officially released patches applying to your system, just run:

```
zypper patch
```

In this case, all patches available in your repositories are checked for relevance and installed, if necessary. The above command is all you must enter in order to apply them when needed.

Zypper knows three different commands to query for the availability of patches:

```
zypper patch-check
```

Lists the number of needed patches (patches, that apply to your system but are not yet installed)

```
~ # zypper patch-check
Loading repository data...
Reading installed packages...
5 patches needed (1 security patch)
```

`zypper list-patches`

Lists all needed patches (patches, that apply to your system but are not yet installed)

```
~ # zypper list-patches
Loading repository data...
Reading installed packages...
```

Repository	Name	Version	Category	Status
Updates for openSUSE 11.3	11.3-1.82	lxsession	2776	security   needed

`zypper patches`

Lists all patches available for , regardless of whether they are already installed or apply to your installation.

It is also possible to list and install patches relevant to specific issues. To list specific patches, use the `zypper list-patches` command with the following options:

`--bugzilla[=number]`

Lists all needed patches for Bugzilla issues. Optionally, you can specify a bug number if you only want to list patches for this specific bug.

`--cve[=number]`

Lists all needed patches for CVE (Common Vulnerabilities and Exposures) issues, or only patches matching a certain CVE number, if specified.

To install a patch for a specific Bugzilla or CVE issue, use the following commands:

```
zypper patch --bugzilla=number
```

or

```
zypper patch --cve=number
```

For example, to install a security patch with the CVE number CVE-2010-2713, execute:

```
zypper patch --cve=CVE-2010-2713
```

### 9.1.3.2 Installing Updates

If a repository contains only new packages, but does not provide patches, `zypper patch` does not show any effect. To update all installed packages with newer available versions, use:

```
zypper update
```

To update individual packages, specify the package with either the `update` or `install` command:

```
zypper update package_name
zypper install package_name
```

A list of all new installable packages can be obtained with the command:

```
zypper list-updates
```

Note that this command only packages lists packages that match the following criteria:

- has the same vendor like the already installed package,
- is provided by repositories with at least the same priority than the already installed package,
- is installable (all dependencies are satisfied).

A list of all new available packages (regardless whether installable or not) can be obtained with:

```
zypper list-updates --all
```

To find out why a new package cannot be installed, just use the `zypper install` or `zypper update` command as described above.

### 9.1.3.3 Upgrading to a New Product Version

To easily upgrade your installation to a new product version (for example, from openSUSE 11.4 to openSUSE 12.1), first adjust your repositories to match the current repositories. For details, refer to [Раздел 9.1.4, «Managing Repositories with Zypper»](#) (стр. 119). Then use the `zypper dist-upgrade` command with the required repositories. This command ensures that all packages will be installed from the repositories currently enabled. For detailed instructions, refer to [Раздел 16.1.4, «Distribution Upgrade with zypper»](#) (стр. 183).

To restrict the distribution upgrade to packages from a certain repository while considering also the other repositories for satisfying dependencies, use the `--from` option and specify the repository by either its alias, its number or URI.

---

**ПРИМЕЧАНИЕ:** Differences between `zypper update` and `zypper dist-upgrade`

Choose `zypper update` to update packages to newer versions available for your product version while maintaining system integrity. `zypper update` will honor the following rules:

- no vendor changes
- no architecture changes
- no downgrades
- keep installed packages

When executing `zypper dist-upgrade`, all packages will be installed from the repositories currently enabled. This rule is enforced, so packages might change

vendor or architecture or even might get downgraded. All packages that have unfulfilled dependencies after the upgrade will be uninstalled.

---

## 9.1.4 Managing Repositories with Zypper

All installation or patch commands of Zypper rely on a list of known repositories. To list all repositories known to the system, use the command:

```
zypper repos
```

The result will look similar to the following output:

Пример 9.1 Zypper—List of Known Repositories

#	Alias	Name	Enabled	Refresh
1	Updates	Updates	Yes	Yes
2	openSUSE 11.2-0	openSUSE 11.2-0	No	No
3	openSUSE-11.2-Debug	openSUSE-11.2-Debug	No	Yes
4	openSUSE-11.2-Non-Oss	openSUSE-11.2-Non-Oss	Yes	Yes
5	openSUSE-11.2-Oss	openSUSE-11.2-Oss	Yes	Yes
6	openSUSE-11.2-Source	openSUSE-11.2-Source	No	Yes

When specifying repositories in various commands, an alias, URI or repository number from the `zypper repos` command output can be used. A repository alias is a short version of the repository name for use in repository handling commands. Note that the repository numbers can change after modifying the list of repositories. The alias will never change by itself.

By default, details such as the URI or the priority of the repository are not displayed. Use the following command to list all details:

```
zypper repos -d
```

### 9.1.4.1 Adding Repositories

To add a repository, run

```
zypper addrepo URIalias
```

*URI* can either be an Internet repository, a network resource, a directory or a CD or DVD (see [http://en.opensuse.org/openSUSE:Libzypp\\_URIs](http://en.opensuse.org/openSUSE:Libzypp_URIs) for details). The *alias* is a shorthand and unique identifier of the repository. You can freely choose it, with the only exception that is has to be unique. Zypper will issue a warning if you specify an alias that is already in use.

### 9.1.4.2 Removing Repositories

If you want to remove a repository from the list, use the command `zypper removerepo` together with the alias or number of the repository you want to delete. For example, to remove the repository listed as third entry in [Пример 9.1, «Zypper—List of Known Repositories»](#) (стр. 119), use the following command:

```
zypper removerepo 3
```

### 9.1.4.3 Modifying Repositories

Enable or disable repositories with `zypper modifyrepo`. You can also alter the repository's properties (such as refreshing behavior, name or priority) with this command. The following command will enable the repository named `updates`, turn on `auto-refresh` and set its priority to 20:

```
zypper modifyrepo -er -p 20 'updates'
```

Modifying repositories is not limited to a single repository—you can also operate on groups:

- `-a`: all repositories
- `-l`: local repositories
- `-t`: remote repositories
- `-m TYPE`: repositories of a certain type (where *TYPE* can be one of the following: `http`, `https`, `ftp`, `cd`, `dvd`, `dir`, `file`, `cifs`, `smb`, `nfs`, `hd`, `iso`)

To rename a repository alias, use the `renamerepo` command. The following example changes the alias from `Mozilla Firefox` to just `firefox`:

```
zypper renamerepo 'Mozilla Firefox' firefox
```

### 9.1.5 Querying Repositories and Packages with Zypper

Zypper offers various methods to query repositories or packages. To get lists of all products, patterns, packages or patches available, use the following commands:

```
zypper products
zypper patterns
zypper packages
zypper patches
```

To query all repositories for certain packages, use `search`. It works on package names, or, optionally, on package summaries and descriptions. Using the wildcards `*` and `?` with the search term is allowed. By default, the search is not case-sensitive.

```
zypper search firefox          # simple search for "firefox"
zypper search "*fire*"        # using wildcards
zypper search -d fire          # also search in package
                               descriptions and summaries
zypper search -u firefox      # only display packages not
                               already installed
```

To search for packages which provide a special capability, use the command `what-provides`. For example, if you would like to know which package provides the `perl` module `SVN::Core`, use the following command:

```
zypper what-provides 'perl(SVN::Core)'
```



To query single packages, use `info` with an exact package name as an argument. It displays detailed information about a package. To also show what is required/recommended by the package, use the options `--requires` and `--recommends`:

```
zypper info --requires MozillaFirefox
```

The `what-provides package` is similar to `rpm -q --whatprovides package`, but `rpm` is only able to query the RPM database (that is the database of all installed packages). Zypper, on the other hand, will tell you about providers of the capability from any repository, not only those that are installed.

## 9.1.6 Configuring Zypper

Zypper now comes with a configuration file, allowing you to permanently change Zypper's behavior (either system-wide or user-specific). For system-wide changes, edit `/etc/zypp/zypper.conf`. For user-specific changes, edit `~/.zypper.conf`. If `~/.zypper.conf` does not yet exist, you can use `/etc/zypp/zypper.conf` as template: copy it to `~/.zypper.conf` and adjust it to your liking. Refer to the comments in the file for help about the available options.

## 9.1.7 Troubleshooting

In case you have problems to access packages from configured repositories (for example, zypper cannot find a certain package though you know that it exists in one the repositories), it can help to refresh the repositories with:

```
zypper refresh
```

If that does not help, try

```
zypper refresh -fdb
```

This forces a complete refresh and rebuild of the database, including a forced download of raw metadata.

## 9.1.8 Zypper Rollback Feature on btrfs File System

If the `btrfs` file system is used on the root partition and `snapper` is installed, zypper automatically calls `snapper` (via script installed by `snapper`) when committing changes to the file system to create appropriate file system snapshots. These snapshots can be used for reverting any changes made by zypper. For more information about `snapper`, see `man snapper`.

Zypper (and YaST) currently only make snapshots of the root filesystem. Other subvolumes cannot be configured. This feature is not supported on the default file system.

## 9.1.9 For More Information

For more information on managing software from the command line, enter `zypper help`, `zypper help command` or refer to the `zypper(8)` manpage. For a

complete and detailed command reference, including `cheat` sheets with the most important commands, and information on how to use Zypper in scripts and applications, refer to [http://en.opensuse.org/SDB:Zypper\\_usage](http://en.opensuse.org/SDB:Zypper_usage). A list of software changes for the latest version can be found at [http://en.opensuse.org/openSUSE:Zypper\\_versions](http://en.opensuse.org/openSUSE:Zypper_versions).

## 9.2 RPM—the Package Manager

RPM (RPM Package Manager) is used for managing software packages. Its main commands are `rpm` and `rpmbuild`. The powerful RPM database can be queried by the users, system administrators and package builders for detailed information about the installed software.

Essentially, `rpm` has five modes: installing, uninstalling (or updating) software packages, rebuilding the RPM database, querying RPM bases or individual RPM archives, integrity checking of packages and signing packages. `rpmbuild` can be used to build installable packages from pristine sources.

Installable RPM archives are packed in a special binary format. These archives consist of the program files to install and certain meta information used during the installation by `rpm` to configure the software package or stored in the RPM database for documentation purposes. RPM archives normally have the extension `.rpm`.

---

### ПОДСКАЗКА: Software Development Packages

For a number of packages, the components needed for software development (libraries, headers, include files, etc.) have been put into separate packages. These development packages are only needed if you want to compile software yourself (for example, the most recent GNOME packages). They can be identified by the name extension `-devel`, such as the packages `alsa-devel`, `gimp-devel`, and `libkde4-devel`.

---

### 9.2.1 Verifying Package Authenticity

RPM packages have a GnuPG signature. To verify the signature of an RPM package, use the command `rpm --checksig package-1.2.3.rpm` to determine whether the package originates from Novell/SUSE or from another trustworthy facility. This is especially recommended for update packages from the Internet.

### 9.2.2 Managing Packages: Install, Update, and Uninstall

Normally, the installation of an RPM archive is quite simple: `rpm -i package.rpm`. With this command the package is installed, but only if its dependencies are fulfilled and if there are no conflicts with other packages. With an error message, `rpm` requests those packages that need to be installed to meet dependency requirements. In the background, the RPM database ensures that no conflicts arise—a specific file can only belong to one package. By choosing different options, you can force `rpm` to ignore these defaults, but this is only for experts. Otherwise, you risk compromising the integrity of the system and possibly jeopardize the ability to update the system.

The options `-U` or `--upgrade` and `-F` or `--freshen` can be used to update a package (for example, `rpm -F package.rpm`). This command removes the files of the old version and immediately installs the new files. The difference between the two versions is that `-U` installs packages that previously did not exist in the system, but `-F` merely updates previously installed packages. When updating, `rpm` updates configuration files carefully using the following strategy:

- If a configuration file was not changed by the system administrator, `rpm` installs the new version of the appropriate file. No action by the system administrator is required.
- If a configuration file was changed by the system administrator before the update, `rpm` saves the changed file with the extension `.rpmorig` or `.rpmsave` (backup file) and installs the version from the new package (but only if the originally installed file and the newer version are different). If this is the case, compare the backup file (`.rpmorig` or `.rpmsave`) with the newly installed file and make your changes again in the new file. Afterwards, be sure to delete all `.rpmorig` and `.rpmsave` files to avoid problems with future updates.
- `.rpmnew` files appear if the configuration file already exists and if the `noreplace` label was specified in the `.spec` file.

Following an update, `.rpmsave` and `.rpmnew` files should be removed after comparing them, so they do not obstruct future updates. The `.rpmorig` extension is assigned if the file has not previously been recognized by the RPM database.

Otherwise, `.rpmsave` is used. In other words, `.rpmorig` results from updating from a foreign format to RPM. `.rpmsave` results from updating from an older RPM to a newer RPM. `.rpmnew` does not disclose any information as to whether the system administrator has made any changes to the configuration file. A list of these files is available in `/var/adm/rpmconfigcheck`. Some configuration files (like `/etc/httpd/httpd.conf`) are not overwritten to allow continued operation.

The `-U` switch is not just an equivalent to uninstalling with the `-e` option and installing with the `-i` option. Use `-U` whenever possible.

To remove a package, enter `rpm -e package.rpm`, which only deletes the package if there are no unresolved dependencies. It is theoretically impossible to delete `Tcl/Tk`, for example, as long as another application requires it. Even in this case, RPM calls for assistance from the database. If such a deletion is, for whatever reason, impossible (even if no additional dependencies exist), it may be helpful to rebuild the RPM database using the option `--rebuilddb`.

## 9.2.3 RPM and Patches

To guarantee the operational security of a system, update packages must be installed in the system from time to time. Previously, a bug in a package could only be eliminated by replacing the entire package. Large packages with bugs in small files could easily result in this scenario. However the SUSE RPM offers a feature enabling the installation of patches in packages.

The most important considerations are demonstrated using `pine` as an example:

Is the patch RPM suitable for my system?

To check this, first query the installed version of the package. For `pine`, this can be done with

```
rpm -q pine
pine-4.44-188
```

Then check if the patch RPM is suitable for this version of `pine`:

```
rpm -qp --basedon pine-4.44-224.i586.patch.rpm
pine = 4.44-188
pine = 4.44-195
pine = 4.44-207
```

This patch is suitable for three different versions of `pine`. The installed version in the example is also listed, so the patch can be installed.

Which files are replaced by the patch?

The files affected by a patch can easily be seen in the patch RPM. The `rpm` parameter `-P` allows selection of special patch features. Display the list of files with the following command:

```
rpm -qpPl pine-4.44-224.i586.patch.rpm
/etc/pine.conf
/etc/pine.conf.fixed
/usr/bin/pine
```

or, if the patch is already installed, with the following command:

```
rpm -qPl pine
/etc/pine.conf
/etc/pine.conf.fixed
/usr/bin/pine
```

How can a patch RPM be installed in the system?

Patch RPMs are used just like normal RPMs. The only difference is that a suitable RPM must already be installed.

Which patches are already installed in the system and for which package versions?

A list of all patches installed in the system can be displayed with the command `rpm -qPa`. If only one patch is installed in a new system (as in this example), the list appears as follows:

```
rpm -qPa
pine-4.44-224
```

If, at a later date, you want to know which package version was originally installed, this information is also available in the RPM database. For `pine`, this information can be displayed with the following command:

```
rpm -q --basedon pine
```

pine = 4.44-188

More information, including information about the patch feature of RPM, is available in the man pages of `rpm` and `rpmbuild`.

---

#### ПРИМЕЧАНИЕ: Official Updates for

In order to make the download size of updates as small as possible, official updates for are not provided as Patch RPMs, but as Delta RPM packages. For details, see [Раздел 9.2.4, «Delta RPM Packages»](#) (стр. 125).

---

### 9.2.4 Delta RPM Packages

Delta RPM packages contain the difference between an old and a new version of an RPM package. Applying a delta RPM onto an old RPM results in a completely new RPM. It is not necessary to have a copy of the old RPM because a delta RPM can also work with an installed RPM. The delta RPM packages are even smaller in size than patch RPMs, which is an advantage when transferring update packages over the Internet. The drawback is that update operations with delta RPMs involved consume considerably more CPU cycles than plain or patch RPMs.

The `prepdeltarpm`, `writedeltarpm` and `applydeltarpm` binaries are part of the delta RPM suite (package `deltarpm`) and help you create and apply delta RPM packages. With the following commands, create a delta RPM called `new.delta.rpm`. The following command assumes that `old.rpm` and `new.rpm` are present:

```
prepdeltarpm -s seq -i info old.rpm > old.cpio
prepdeltarpm -f new.rpm > new.cpio
xdelta delta -0 old.cpio new.cpio delta
writedeltarpm new.rpm delta info new.delta.rpm
```

Finally, remove the temporary working files `old.cpio`, `new.cpio`, and `delta`.

Using `applydeltarpm`, you can reconstruct the new RPM from the file system if the old package is already installed:

```
applydeltarpm new.delta.rpm new.rpm
```

To derive it from the old RPM without accessing the file system, use the `-r` option:

```
applydeltarpm -r old.rpm new.delta.rpm new.rpm
```

See `/usr/share/doc/packages/deltarpm/README` for technical details.

### 9.2.5 RPM Queries

With the `-q` option `rpm` initiates queries, making it possible to inspect an RPM archive (by adding the option `-p`) and also to query the RPM database of installed packages. Several switches are available to specify the type of information required. See [Таблица 9.1, «The Most Important RPM Query Options»](#) (стр. 126).

Таблица 9.1 The Most Important RPM Query Options

<code>-i</code>	Package information
<code>-l</code>	File list
<code>-f FILE</code>	Query the package that contains the file <i>FILE</i> (the full path must be specified with <i>FILE</i> )
<code>-s</code>	File list with status information (implies <code>-l</code> )
<code>-d</code>	List only documentation files (implies <code>-l</code> )
<code>-c</code>	List only configuration files (implies <code>-l</code> )
<code>--dump</code>	File list with complete details (to be used with <code>-l</code> , <code>-c</code> , or <code>-d</code> )
<code>--provides</code>	List features of the package that another package can request with <code>--requires</code>
<code>--requires, -R</code>	Capabilities the package requires
<code>--scripts</code>	Installation scripts (preinstall, postinstall, uninstall)

For example, the command `rpm -q -i wget` displays the information shown in **Пример 9.2, «rpm -q -i wget»** (стр. 126).

#### Пример 9.2 rpm -q -i wget

```

Name           : wget                               Relocations: (not
relocatable)
Version        : 1.11.4                             Vendor:
openSUSE
Release       : 1.70                                Build Date: Sat 01
Aug 2009 09:49:48 CEST
Install Date: Thu 06 Aug 2009 14:53:24 CEST      Build Host:
build18
Group         : Productivity/Networking/Web/Utilities Source
RPM: wget-1.11.4-1.70.src.rpm

```

```

Size           : 1525431                               License: GPL v3
or later
Signature      : RSA/8, Sat 01 Aug 2009 09:50:04 CEST, Key ID
b88b2fd43dbdc284
Packager       : http://bugs.opensuse.org
URL            : http://www.gnu.org/software/wget/
Summary       : A Tool for Mirroring FTP and HTTP Servers
Description    :
Wget enables you to retrieve WWW documents or FTP files from a
server.
This can be done in script files or via the command line.
[...]
```

The option `-f` only works if you specify the complete filename with its full path. Provide as many filenames as desired. For example, the following command

```
rpm -q -f /bin/rpm /usr/bin/wget
```

results in:

```
rpm-4.8.0-4.3.x86_64
wget-1.11.4-11.18.x86_64
```

If only part of the filename is known, use a shell script as shown in [Пример 9.3, «Script to Search for Packages»](#) (стр. 127). Pass the partial filename to the script shown as a parameter when running it.

### Пример 9.3 Script to Search for Packages

```

#!/bin/sh
for i in $(rpm -q -a -l | grep $1); do
    echo "\"$i\" is in package:"
    rpm -q -f $i
    echo ""
done
```

The command `rpm -q --changelog rpm` displays a detailed list of change information about a specific package (in this case, the `rpm` package), sorted by date.

With the help of the installed RPM database, verification checks can be made. Initiate these with `-V`, `-y` or `--verify`. With this option, `rpm` shows all files in a package that have been changed since installation. `rpm` uses eight character symbols to give some hints about the following changes:

Таблица 9.2 RPM Verify Options

5	MD5 check sum
S	File size
L	Symbolic link

T	Modification time
D	Major and minor device numbers
U	Owner
G	Group
M	Mode (permissions and file type)

In the case of configuration files, the letter `c` is printed. For example, for changes to `/etc/wgetrc` (`wget` package):

```
rpm -V wget
S.5....T c /etc/wgetrc
```

The files of the RPM database are placed in `/var/lib/rpm`. If the partition `/usr` has a size of 1 GB, this database can occupy nearly 30 MB, especially after a complete update. If the database is much larger than expected, it is useful to rebuild the database with the option `--rebuilddb`. Before doing this, make a backup of the old database. The `cron` script `cron.daily` makes daily copies of the database (packed with `gzip`) and stores them in `/var/adm/backup/rpmdb`. The number of copies is controlled by the variable `MAX_RPMD_B_BACKUPS` (default: 5) in `/etc/sysconfig/backup`. The size of a single backup is approximately 1 MB for 1 GB in `/usr`.

## 9.2.6 Installing and Compiling Source Packages

All source packages carry a `.src.rpm` extension (source RPM).

---

### ПРИМЕЧАНИЕ: Installed Source Packages

Source packages can be copied from the installation medium to the hard disk and unpacked with `YaST`. They are not, however, marked as installed (`[i]`) in the package manager. This is because the source packages are not entered in the RPM database. Only installed operating system software is listed in the RPM database. When you «install» a source package, only the source code is added to the system.

---

The following directories must be available for `rpm` and `rpmbuild` in `/usr/src/packages` (unless you specified custom settings in a file like `/etc/rpmmrc`):

#### SOURCES

for the original sources (`.tar.bz2` or `.tar.gz` files, etc.) and for distribution-specific adjustments (mostly `.diff` or `.patch` files)

#### SPECS

for the `.spec` files, similar to a meta Makefile, which control the build process



BUILD

all the sources are unpacked, patched and compiled in this directory

RPMS

where the completed binary packages are stored

SRPMS

here are the source RPMs

When you install a source package with YaST, all the necessary components are installed in `/usr/src/packages`: the sources and the adjustments in `SOURCES` and the relevant `.spec` file in `SPECS`.

---

## ПРЕДУПРЕЖДЕНИЕ

Do not experiment with system components (`glibc`, `rpm`, `sysvinit`, etc.), because this endangers the stability of your system.

---

The following example uses the `wget.src.rpm` package. After installing the source package, you should have files similar to those in the following list:

```
/usr/src/packages/SOURCES/wget-1.11.4.tar.bz2
/usr/src/packages/SOURCES/wgetrc.patch
/usr/src/packages/SPECS/wget.spec
```

`rpmbuild -bX /usr/src/packages/SPECS/wget.spec` starts the compilation. `X` is a wild card for various stages of the build process (see the output of `--help` or the RPM documentation for details). The following is merely a brief explanation:

`-bp`

Prepare sources in `/usr/src/packages/BUILD`: unpack and patch.

`-bc`

Do the same as `-bp`, but with additional compilation.

`-bi`

Do the same as `-bp`, but with additional installation of the built software. Caution: if the package does not support the BuildRoot feature, you might overwrite configuration files.

`-bb`

Do the same as `-bi`, but with the additional creation of the binary package. If the compile was successful, the binary should be in `/usr/src/packages/RPMS`.

`-ba`

Do the same as `-bb`, but with the additional creation of the source RPM. If the compilation was successful, the binary should be in `/usr/src/packages/SRPMS`.

`--short-circuit`

Skip some steps.

The binary RPM created can now be installed with `rpm -i` or, preferably, with `rpm -U`. Installation with `rpm` makes it appear in the RPM database.

### 9.2.7 Compiling RPM Packages with build

The danger with many packages is that unwanted files are added to the running system during the build process. To prevent this use `build`, which creates a defined environment in which the package is built. To establish this chroot environment, the `build` script must be provided with a complete package tree. This tree can be made available on the hard disk, via NFS, or from DVD. Set the position with `build --rpms directory`. Unlike `rpm`, the `build` command looks for the `.spec` file in the source directory. To build `wget` (like in the above example) with the DVD mounted in the system under `/media/dvd`, use the following commands as `root`:

```
cd /usr/src/packages/SOURCES/  
mv ../SPECS/wget.spec .  
build --rpms /media/dvd/suse/ wget.spec
```

Subsequently, a minimum environment is established at `/var/tmp/build-root`. The package is built in this environment. Upon completion, the resulting packages are located in `/var/tmp/build-root/usr/src/packages/RPMS`.

The `build` script offers a number of additional options. For example, cause the script to prefer your own RPMs, omit the initialization of the build environment or limit the `rpm` command to one of the above-mentioned stages. Access additional information with `build --help` and by reading the `build` man page.

### 9.2.8 Tools for RPM Archives and the RPM Database

Midnight Commander (`mc`) can display the contents of RPM archives and copy parts of them. It represents archives as virtual file systems, offering all usual menu options of Midnight Commander. Display the `HEADER` with `[F3]`. View the archive structure with the cursor keys and `[Enter]`. Copy archive components with `[F5]`.

A full-featured package manager is available as a YaST module. For details, see [Глава 5, Installing or Removing Software](#) (стр. 81).

## Часть III. Администрирование



## 10 Managing Users with YaST

During installation, you chose a method for user authentication. This method is either local (via `/etc/passwd`) or, if a network connection is established, via NIS, LDAP, Kerberos or Samba (see Раздел “Create New User” (Глава 1, Installation with YaST, ↑Содержание) . You can create or modify user accounts and change the authentication method with YaST at any time.

Every user is assigned a system-wide user ID (UID). Apart from the users which can log in to your machine, there are also a number of system users for internal use only. Each user is assigned to one or more groups. Similar to system users, there are also system groups for internal use.

### 10.1 User and Group Administration Dialog

To administer users or groups, start YaST and click Security and Users > User and Group Management. Alternatively, start the User and Group Administration dialog directly by running `yast2 users &` from a command line.

Рисунок 10.1 YaST User and Group Administration



Depending on the set of users you choose to view and modify with, the dialog (local users, network users, system users), the main window shows several tabs. These allow you to execute the following tasks:

## Managing User Accounts

From the Users tab create, modify, delete or temporarily disable user accounts as described in [Раздел 10.2, «Managing User Accounts»](#) (стр. 134). Learn about advanced options like enforcing password policies, using encrypted home directories, using fingerprint authentication, or managing disk quotas in [Раздел 10.3, «Additional Options for User Accounts»](#) (стр. 136).

## Changing Default Settings

Local users accounts are created according to the settings defined on the Defaults for New Users tab. Learn how to change the default group assignment, or the default path and access permissions for home directories in [Раздел 10.4, «Changing Default Settings for Local Users»](#) (стр. 141).

## Assigning Users to Groups

Learn how to change the group assignment for individual users in [Раздел 10.5, «Assigning Users to Groups»](#) (стр. 141).

## Managing Groups

From the Groups tab, you can add, modify or delete existing groups. Refer to [Раздел 10.6, «Managing Groups»](#) (стр. 142) for information on how to do this.

## Changing the User Authentication Method

When your machine is connected to a network that provides user authentication methods like NIS or LDAP, you can choose between several authentication methods on the Authentication Settings tab. For more information, refer to [Раздел 10.7, «Changing the User Authentication Method»](#) (стр. 143).

For user and group management, the dialog provides similar functionality. You can easily switch between the user and group administration view by choosing the appropriate tab at the top of the dialog.

Filter options allow you to define the set of users or groups you want to modify: On the Users or Group tab, click Set Filter to view and edit users or groups according to certain categories, such as Local Users or LDAP Users, for instance (if you are part of a network which uses LDAP). With Set Filter > Customize Filter you can also set up and use a custom filter.

Depending on the filter you choose, not all of the following options and functions will be available from the dialog.

# 10.2 Managing User Accounts

YaST offers to create, modify, delete or temporarily disable user accounts. Do not modify user accounts unless you are an experienced user or administrator.

---

### ПРИМЕЧАНИЕ: Changing User IDs of Existing Users

File ownership is bound to the user ID, not to the user name. After a user ID change, the files in the user's home directory are automatically adjusted to reflect this change. However, after an ID change, the user no longer owns the files he

created elsewhere in the file system unless the file ownership for those files are manually modified.

---

In the following, learn how to set up default user accounts. For some further options, such as auto login, login without password, setting up encrypted home directories or managing quotas for users and groups, refer to [Раздел 10.3, «Additional Options for User Accounts»](#) (стр. 136).

#### Процедура 10.1 Adding or Modifying User Accounts

- 1 Open the YaST User and Group Administration dialog and click the Users tab.
- 2 With Set Filter define the set of users you want to manage. The dialog shows a list of users in the system and the groups the users belong to.
- 3 To modify options for an existing user, select an entry and click Edit.

To create a new user account, click Add.

- 4 Enter the appropriate user data on the first tab, such as Username (which is used for login) and Password. This data is sufficient to create a new user. If you click OK now, the system will automatically assign a user ID and set all other values according to the default.
- 5 Activate Receive System Mail if you want any kind of system notifications to be delivered to this user's mailbox. This creates a mail alias for `root` and the user can read the system mail without having to first log in as `root`.
- 6 If you want to adjust further details such as the user ID or the path to the user's home directory, do so on the Details tab.

If you need to relocate the home directory of an existing user, enter the path to the new home directory there and move the contents of the current home directory with Move to New Location. Otherwise, a new home directory is created without any of the existing data.

- 7 To force users to regularly change their password or set other password options, switch to Password Settings and adjust the options. For more details, refer to [Раздел 10.3.2, «Enforcing Password Policies»](#) (стр. 136).
- 8 If all options are set according to your wishes, click OK.
- 9 Click Expert Options > Write Changes Now to save all changes without exiting the User and Group Administration dialog. Click OK to close the administration dialog and to save the changes. A newly added user can now log in to the system using the login name and password you created.

---

#### ПОДСКАЗКА: Matching User IDs

For a new (local) user on a laptop which also needs to integrate into a network environment where this user already has a user ID, it is useful to match the (local)

user ID to the ID in the network. This ensures that the file ownership of the files the user creates «offline» is the same as if he had created them directly on the network.

---

## Процедура 10.2 Disabling or Deleting User Accounts

- 1 Open the YaST User and Group Administration dialog and click the Users tab.
- 2 To temporarily disable a user account without deleting it, select the user from the list and click Edit. Activate Disable User Login. The user cannot log into your machine until you enable the account again.
- 3 To delete a user account, select the user from the list and click Delete. Choose if you also want to delete the user's home directory or if you want to retain the data.

## 10.3 Additional Options for User Accounts

In addition to the settings for a default user account, offers further options, such as options to enforce password policies, use encrypted home directories or define disk quotas for users and groups.

### 10.3.1 Automatic Login and Passwordless Login

If you use the KDE or GNOME desktop environment you can configure Auto Login for a certain user as well as Passwordless Login for all users. Auto login causes a user to become automatically logged in to the desktop environment on boot. This functionality can only be activated for one user at a time. Login without password allows all users to log in to the system after they have entered their username in the login manager.

---

#### ПРЕДУПРЕЖДЕНИЕ: Security Risk

Enabling Auto Login or Passwordless Login on a machine that can be accessed by more than one person is a security risk. Without the need to authenticate, any user can gain access to your system and your data. If your system contains confidential data, do not use this functionality.

---

If you want to activate auto login or login without password, access these functions in the YaST User and Group Administration with Expert Options > Login Settings.

### 10.3.2 Enforcing Password Policies

On any system with multiple users, it is a good idea to enforce at least basic password security policies. Users should change their passwords regularly and use strong passwords that cannot easily be exploited. For local users, proceed as follows:

#### Процедура 10.3 Configuring Password Settings

- 1 Open the YaST User and Group Administration dialog and select the Users tab.



- 2 Select the user for which to change the password options and click Edit.
- 3 Switch to the Password Settings tab. The user's last password change is displayed on the tab.
- 4 To make the user change his password at next login, activate Force Password Change.
- 5 To enforce password rotation, set a Maximum Number of Days for the Same Password and a Minimum Number of Days for the Same Password.
- 6 To remind the user to change his password before it expires, set a number of Days before Password Expiration to Issue Warning.
- 7 To restrict the period of time the user can log in after his password has expired, change the value in Days after Password Expires with Usable Login.
- 8 You can also specify a certain expiration date for a password. Enter the Expiration Date in *YYYY-MM-DD* format.
- 9 For more information about the options and about the default values, click Help.
- 10 Apply your changes with OK.

### 10.3.3 Managing Encrypted Home Directories

To protect data in home directories against theft and hard disk removal, you can create encrypted home directories for users. These are encrypted with LUKS (Linux Unified Key Setup), which results in an image and an image key being generated for the user. The image key is protected with the user's login password. When the user logs into the system, the encrypted home directory is mounted and the contents are made available to the user.

---

**ПРИМЕЧАНИЕ:** Fingerprint Reader Devices and Encrypted Home Directories

If you want to use a fingerprint reader device, you must not use encrypted home directories. Otherwise logging in will fail, because decrypting during login is not possible in combination with an active fingerprint reader device.

---

With YaST, you can create encrypted home directories for new or existing users. To encrypt or modify encrypted home directories of already existing users, you need to know the user's current login password. By default, all existing user data is copied to the new encrypted home directory, but it is not deleted from the unencrypted directory.

---

**ПРЕДУПРЕЖДЕНИЕ:** Security Restrictions

Encrypting a user's home directory does not provide strong security from other users. If strong security is required, the system should not be physically shared.

---

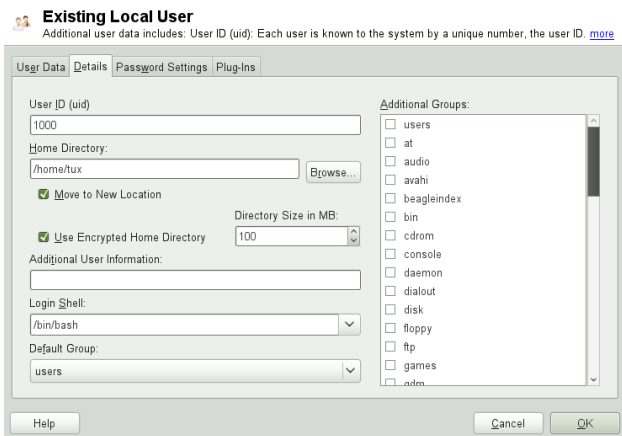
Find background information about encrypted home directories and which actions to take for stronger security in Раздел "Использование зашифрованных домашних директорий" (Глава 10, Шифрование файлов и разделов, ↑Руководство по безопасности).

#### Процедура 10.4 Creating Encrypted Home Directories

- 1 Open the YaST User and Group Management dialog and click the Users tab.
- 2 To encrypt the home directory of an existing user, select the user and click Edit.

Otherwise, click Add to create a new user account and enter the appropriate user data on the first tab.

- 3 In the Details tab, activate Use Encrypted Home Directory. With Directory Size in MB, specify the size of the encrypted image file to be created for this user.



- 4 Apply your settings with OK.
- 5 Enter the user's current login password to proceed if YaST prompts for it.
- 6 Click Expert Options > Write Changes Now to save all changes without exiting the administration dialog. Click OK to close the administration dialog and save the changes.

#### Процедура 10.5 Modifying or Disabling Encrypted Home Directories

Of course, you can also disable the encryption of a home directory or change the size of the image file at any time.

- 1 Open the YaST User and Group Administration dialog in the Users view.

- 2 Select a user from the list and click Edit.
- 3 If you want to disable the encryption, switch to the Details tab and disable Use Encrypted Home Directory.  
  
If you need to enlarge or reduce the size of the encrypted image file for this user, change the Directory Size in MB.
- 4 Apply your settings with OK.
- 5 Enter the user's current login password to proceed if YaST prompts for it.
- 6 Click Expert Options > Write Changes Now to save all changes without exiting the User and Group Administration dialog. Click OK to close the administration dialog and to save the changes.

### 10.3.4 Using Fingerprint Authentication

If your system includes a fingerprint reader you can use biometric authentication in addition to standard authentication via login and password. After registering their fingerprint, users can log into the system either by swiping a finger on the fingerprint reader or by typing in a password.

Fingerprints can be registered with YaST. Find detailed information about configuration and use of fingerprint authentication in Глава 7, Использование сканера отпечатков пальцев (↑Руководство по безопасности). For a list of supported devices, refer to <http://www.freedesktop.org/wiki/Software/fprint/libfprint>.

### 10.3.5 Managing Quotas

To prevent system capacities from being exhausted without notification, system administrators can set up quotas for users or groups. Quotas can be defined for one or more file systems and restrict the amount of disk space that can be used and the number of inodes (index nodes) that can be created there. Inodes are data structures on a file system that store basic information about a regular file, directory, or other file system object. They store all attributes of a file system object (like user and group ownership, read, write, or execute permissions), except file name and contents.

allows usage of `soft` and `hard` quotas. Soft quotas usually define a warning level at which users are informed that they are nearing their limit, whereas hard quotas define the limit at which write requests are denied. Additionally, grace intervals can be defined that allow users or groups to temporarily violate their quotas by certain amounts.

#### Процедура 10.6 Enabling Quota Support for a Partition

In order to configure quotas for certain users and groups, you need to enable quota support for the respective partition in the YaST Expert Partitioner first.

- 1 In YaST, select System > Partitioner and click Yes to proceed.
- 2 In the Expert Partitioner, select the partition for which to enable quotas and click Edit.

- 3 Click Fstab Options and activate Enable Quota Support. If the `quota` package is not already installed, it will be installed once you confirm the respective message with Yes.
- 4 Confirm your changes and leave the Expert Partitioner.

## Процедура 10.7 Setting Up Quotas for Users or Groups

Now you can define soft or hard quotas for specific users or groups and set time periods as grace intervals.

- 1 In the YaST User and Group Administration, select the user or the group you want to set the quotas for and click Edit.
- 2 On the Plug-Ins tab, select the Manage User Quota entry and click Launch to open the Quota Configuration dialog.
- 3 From File System, select the partition to which the quota should apply.

**Quota Configuration**  
Here, configure quota settings of the user on selected file systems. [more](#)

File System:  
/dev/sda8

**Size Limits**  
Soft limit:  
5  
Hard limit:  
8  
Days: 0 Hours: 0 Minutes: 0 Seconds: 0

**Inodes Limits**  
Soft limit:  
2  
Hard limit:  
4  
Days: 0 Hours: 0 Minutes: 0 Seconds: 0

Help Cancel OK

- 4 Below Size Limits, restrict the amount of disk space. Enter the number of 1 KB blocks the user or group may have on this partition. Specify a Soft Limit and a Hard Limit value.
- 5 Additionally, you can restrict the number of inodes the user or group may have on the partition. Below Inodes Limits, enter a Soft Limit and Hard Limit.
- 6 You can only define grace intervals if the user or group has already exceeded the soft limit specified for size or inodes. Otherwise, the time-related input fields are not activated. Specify the time period for which the user or group is allowed to exceed the limits set above.
- 7 Confirm your settings with OK.

- 8 Click Expert Options > Write Changes Now to save all changes without exiting the User and Group Administration dialog. Click OK to close the administration dialog and to save the changes.

also ships command line tools like `repquota` or `warnquota` with which system administrators can control the disk usage or send e-mail notifications to users exceeding their quota. With `quota_nld`, administrators can also forward kernel messages about exceeded quotas to D-BUS. For more information, refer to the `repquota`, the `warnquota` and the `quota_nld` man page.

## 10.4 Changing Default Settings for Local Users

When creating new local users, several default settings are used by YaST. These include, for example, the primary group and the secondary groups the user belongs to, or the access permissions of the user's home directory. You can change these default settings to meet your requirements:

- 1 Open the YaST User and Group Administration dialog and select the Defaults for New Users tab.
- 2 To change the primary group the new users should automatically belong to, select another group from Default Group.
- 3 To modify the secondary groups for new users, add or change groups in Secondary Groups. The group names must be separated by commas.
- 4 If you do not want to use `/home/username` as default path for new users' home directories, modify the Path Prefix for Home Directory.
- 5 To change the default permission modes for newly created home directories, adjust the umask value in Umask for Home Directory. For more information about umask, refer to Глава 9, Списки управления доступом в Linux (↑Руководство по безопасности) and to the `umask` man page.
- 6 For information about the individual options, click Help.
- 7 Apply your changes with OK.

## 10.5 Assigning Users to Groups

Local users are assigned to several groups according to the default settings which you can access from the User and Group Administration dialog on the Defaults for New Users tab. In the following, learn how to modify an individual user's group assignment. If you need to change the default group assignments for new users, refer to [Раздел 10.4, «Changing Default Settings for Local Users»](#) (стр. 141).

### Процедура 10.8 Changing a User's Group Assignment

- 1 Open the YaST User and Group Administration dialog and click the Users tab. It shows a list of users and of the groups the users belong to.

- 2 Click Edit and switch to the Details tab.
- 3 To change the primary group the user belongs to, click Default Group and select the group from the list.
- 4 To assign the user additional secondary groups, activate the corresponding check boxes in the Additional Groups list.
- 5 Click OK to apply your changes.
- 6 Click Expert Options > Write Changes Now to save all changes without exiting the User and Group Administration dialog. Click OK to close the administration dialog and save the changes.

## 10.6 Managing Groups

With YaST you can also easily add, modify or delete groups.

### Процедура 10.9 Creating and Modifying Groups

- 1 Open the YaST User and Group Management dialog and click the Groups tab.
- 2 With Set Filter define the set of groups you want to manage. The dialog shows a list of groups in the system.
- 3 To create a new group, click Add.
- 4 To modify an existing group, select the group and click Edit.
- 5 In the following dialog, enter or change the data. The list on the right shows an overview of all available users and system users which can be members of the group.

**Existing Local Group**  
Enter the group data here. [more](#)

Group **Data** | Plug-Ins

Group **Name**:  
users

Group **ID (gid)**:  
100

**Password**:  
\*\*\*\*\*

**Confirm Password**:  
\*\*\*\*\*

**Group Members**:

- ☐ at
- ☐ avahi
- ☐ beagleindex
- ☐ bin
- ☐ daemon
- ☐ dnsmasq
- ☒ games
- ☒ testy
- ☒ tux

Help Cancel OK

- 6 To add existing users to a new group select them from the list of possible Group Members by checking the corresponding box. To remove them from the group uncheck the box.
- 7 Click OK to apply your changes.
- 8 Click Expert Options > Write Changes Now to save all changes without exiting the User and Group Administration dialog.

In order to delete a group, it must not contain any group members. To delete a group, select it from the list and click Delete. Click Expert Options > Write Changes Now to save all changes without exiting the User and Group Administration dialog. Click OK to close the administration dialog and to save the changes.

## 10.7 Changing the User Authentication Method

When your machine is connected to a network, you can change the authentication method you set during installation. The following options are available:

### NIS

Users are administered centrally on a NIS server for all systems in the network. For details, see Глава 3, Использование NIS (↑Руководство по безопасности).

### LDAP

Users are administered centrally on an LDAP server for all systems in the network. For details about LDAP, see Глава 4, LDAP — Сервис директорий (↑Руководство по безопасности).

You can manage LDAP users with the YaST user module. All other LDAP settings, including the default settings for LDAP users, have to be defined with the YaST LDAP client module as described in Раздел “Конфигурирование клиента LDAP с помощью YaST” (Глава 4, LDAP — Сервис директорий, ↑Руководство по безопасности) .

### Kerberos

With Kerberos, a user registers once and then is trusted in the entire network for the rest of the session.

### Samba

SMB authentication is often used in mixed Linux and Windows networks. For details, see Глава 15, Samba (↑Содержание) and Глава 5, Active Directory Support (↑Руководство по безопасности).

To change the authentication method, proceed as follows:

- 1 Open the User and Group Administration dialog in YaST.
- 2 Click the Authentication Settings tab to show an overview of the available authentication methods and the current settings.
- 3 To change the authentication method, click Configure and select the authentication method you want to modify. This takes you directly to the client

configuration modules in YaST. For information about the configuration of the appropriate client, refer to the following sections:

NIS: Раздел “Настройка NIS-клиентов” (Глава 3, Использование NIS, ↑Руководство по безопасности)

LDAP: Раздел “Конфигурирование клиента LDAP с помощью YaST” (Глава 4, LDAP — Сервис директорий, ↑Руководство по безопасности)

- 4 After accepting the configuration, return to the User and Group Administration overview.
- 5 Click OK to close the administration dialog.



## 11 Changing Language and Country Settings with YaST

Working in different countries or having to work in a multilingual environment requires your computer to be set up to support this. can handle different `locales` in parallel. A locale is a set of parameters that defines the language and country settings reflected in the user interface.

The main system language was selected during installation and keyboard and time zone settings were adjusted. However, you can install additional languages on your system and determine which of the installed languages should be the default.

For those tasks, use the YaST language module as described in [Раздел 11.1, «Changing the System Language»](#) (стр. 145). Install secondary languages to get optional localizations if you need to start applications or desktops in languages other than the primary one.

Apart from that, the YaST timezone module allows you to adjust your country and timezone settings accordingly. It also lets you synchronize your system clock against a time server. For details, refer to [Раздел 11.2, «Changing the Country and Time Settings»](#) (стр. 148).

### 11.1 Changing the System Language

Depending on how you use your desktop and whether you want to switch the entire system to another language or just the desktop environment itself, there are several ways to achieve this:

#### Changing the System Language Globally

Proceed as described in [Раздел 11.1.1, «Modifying System Languages with YaST»](#) (стр. 146) and [Раздел 11.1.2, «Switching the Default System Language»](#) (стр. 147) to install additional localized packages with YaST and to set the default language. Changes are effective after relogin. To ensure that the entire system reflects the change, reboot the system or close and restart all running services, applications, and programs.

#### Changing the Language for the Desktop Only

Provided you have previously installed the desired language packages for your desktop environment with YaST as described below, you can switch the language of your desktop using the desktop's control center. After the X server has been restarted, your entire desktop reflects your new choice of language. Applications not belonging to your desktop framework are not affected by this change and may still appear in the language that was set in YaST.

#### Temporarily Switching Languages for One Application Only

You can also run a single application in another language (that has already been installed with YaST). To do so, start it from the command line by specifying the

language code as described in **Раздел 11.1.3, «Switching Languages for Individual Applications»** (стр. 148).

### 11.1.1 Modifying System Languages with YaST

YaST knows two different language categories:

#### Primary Language

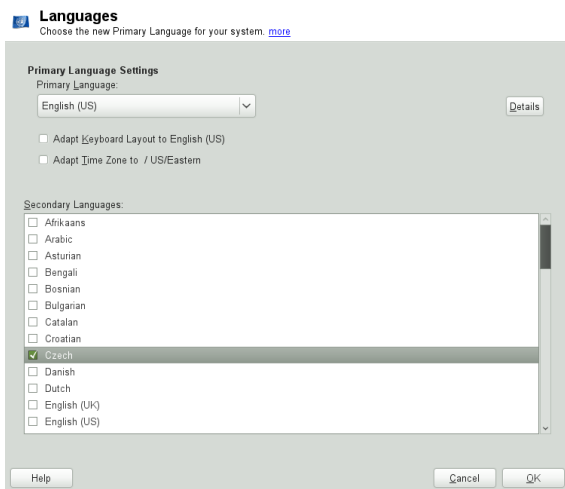
The primary language set in YaST applies to the entire system, including YaST and the desktop environment. This language is used whenever available unless you manually specify another language.

#### Secondary Languages

Install secondary languages to make your system multilingual. Languages installed as secondary languages can be selected manually for a specific situation. For example, use a secondary language to start an application in a certain language in order to do word processing in this language.

Before installing additional languages, determine which of them should be the default system language (primary language) after you have installed them.

To access the YaST language module, start YaST and click **System > Language**. Alternatively, start the Languages dialog directly by running `yast2 language` & as user `root` from a command line.



#### Процедура 11.1 Installing Additional Languages

When installing additional languages, YaST also allows you to set different locale settings for the user `root`, see **Шар 4** (стр. 147). The option Locale Settings for

User root determines how the locale variables (LC\_\*) in the file /etc/sysconfig/language are set for root. You can either set them to the same locale as for normal users, keep it unaffected by any language changes or only set the variable RC\_LC\_TYPE to the same values as for the normal users. This variable sets the localization for language-specific function calls.

- 1 To add additional languages in the YaST language module, select the Secondary Languages you wish to install.
- 2 To make a language the default language, set it as Primary Language.
- 3 Additionally, adapt the keyboard to the new primary language and adjust the time zone, if appropriate.

---

#### ПОДСКАЗКА

For advanced keyboard or time zone settings, select Hardware > Keyboard Layout or System > Date and Time in YaST to start the respective dialogs. For more information, refer to [Раздел 11.2, «Changing the Country and Time Settings»](#) (стр. 148).

---

- 4 To change language settings specific to the user root, click Details.
  - 4a Set Locale Settings for User root to the desired value. For more information, click Help.
  - 4b Decide if you want to Use UTF-8 Encoding for root or not.
- 5 If your locale was not included in the list of primary languages available, try specifying it with Detailed Locale Setting. However, some of these localizations may be incomplete.
- 6 Confirm your changes in the dialogs with OK. If you have selected secondary languages, YaST installs the localized software packages for the additional languages.

The system is now multilingual. However, to start an application in a language other than the primary one, you need to set the desired language explicitly as explained in [Раздел 11.1.3, «Switching Languages for Individual Applications»](#) (стр. 148).

### 11.1.2 Switching the Default System Language

- 1 To globally switch the default system language, start the YaST language module.
- 2 Select the desired new system language as Primary Language.

---

#### ВАЖНО: Deleting Former System Languages

If you switch to a different primary language, the localized software packages for the former primary language will be removed from the system. If you want

to switch the default system language but want to keep the former primary language as additional language, add it as Secondary Language by enabling the respective checkbox.

---

- 3 Adjust the keyboard and time zone options as desired.
- 4 Confirm your changes with OK.
- 5 After YaST has applied the changes, restart any X sessions (for example, by logging out and logging in again) to make YaST and the desktop applications reflect your new language settings.

### 11.1.3 Switching Languages for Individual Applications

After you have installed the respective language with YaST, you can run a single application in another language.

#### Standard X and GNOME Applications

Start the application from the command line by using the following command:

```
LANG=languageapplication
```

For example, to start f-spot in German, run `LANG=de_DE f-spot`. For other languages, use the appropriate language code. Get a list of all language codes available with the `locale -av` command.

#### KDE Applications

Start the application from the command line by using the following command:

```
KDE_LANG=languageapplication
```

For example, to start digiKam in German, run `KDE_LANG=de digikam`. For other languages, use the appropriate language code.

## 11.2 Changing the Country and Time Settings

Using the YaST date and time module, adjust your system date, clock and time zone information to the area you are working in. To access the YaST module, start YaST and click System > Date and Time. Alternatively, start the Clock and Time Zone dialog directly by running `yast2 timezone` & as user `root` from a command line.



## Clock and Time Zone

To select the time zone to use in your system, first select the Region. [more](#)

Region: Europe Time Zone: Germany

☒ Hardware Clock Set To UTC

Date and Time (NTP is configured)  
2010-08-04 - 10:16:52 Change...

Help Cancel OK

First, select a general region, such as Europe. Choose an appropriate country that matches the one you are working in, for example, Germany.

Depending on which operating systems run on your workstation, adjust the hardware clock settings accordingly:

- If you run another operating system on your machine, such as Microsoft Windows\*, it is likely your system does not use UTC, but local time. In this case, uncheck Hardware Clock Set To UTC.
- If you only run Linux on your machine, set the hardware clock to UTC and have the switch from standard time to daylight saving time performed automatically.

You can change the date and time manually or opt for synchronizing your machine against an NTP server, either permanently or just for adjusting your hardware clock.

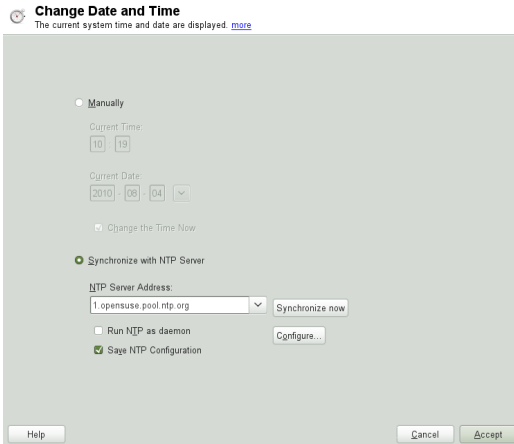
### Процедура 11.2 Manually Adjusting Time and Date

- 1 In the YaST timezone module, click Change to set date and time.
- 2 Select Manually and enter date and time values.
- 3 Confirm your changes with Accept.

### Процедура 11.3 Setting Date and Time With NTP Server

- 1 Click Change to set date and time.
- 2 Select Synchronize with NTP Server.

- 3 Enter the address of an NTP server, if not already populated.



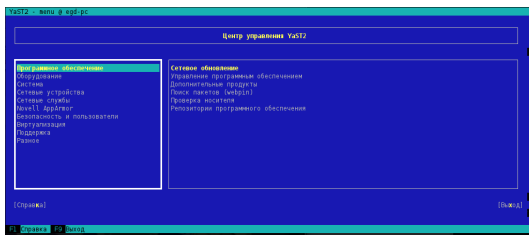
- 4 Click Synchronize Now, to get your system time set correctly.
- 5 If you want to make use of NTP permanently, enable Save NTP Configuration.
- 6 With the Configure button, you can open the advanced NTP configuration. For details, see Раздел "Configuring an NTP Client with YaST" (Глава 13, Time Synchronization with NTP, ↑Содержание).
- 7 Confirm your changes with Accept.

## 12 YaST in Text Mode

This section is intended for system administrators and experts who do not run an X server on their systems and depend on the text-based installation tool. It provides basic information about starting and operating YaST in text mode.

YaST in text mode uses the ncurses library to provide an easy pseudo-graphical user interface. The ncurses library is installed by default. The minimum supported size of the terminal emulator in which to run YaST is 80x25 characters.

Рисунок 12.1 Main Window of YaST in Text Mode



When you start YaST in text mode, the YaST Control Center appears (see [Рисунок 12.1](#)). The main window consists of three areas. The left frame features the categories to which the various modules belong. This frame is active when YaST is started and therefore it is marked by a bold white border. The active category is highlighted. The right frame provides an overview of the modules available in the active category. The bottom frame contains the buttons for Help and Quit.

When you start the YaST Control Center, the category Software is selected automatically. Use [↑] and [↓] to change the category. To select a module from the category, activate the right frame with [→] and then use [↑] and [↓] to select the module. Keep the arrow keys pressed to scroll through the list of available modules. The selected module is highlighted. Press [↵] to start the active module.

Various buttons or selection fields in the module contain a highlighted letter (yellow by default). Use [↵] + [highlighted\_letter] to select a button directly instead of navigating there with [Tab]. Exit the YaST Control Center by pressing [↵] + [Q] or by selecting Quit and pressing [↵].

## 12.1 Navigation in Modules

The following description of the control elements in the YaST modules assumes that all function keys and [↵] key combinations work and are not assigned to different global functions. Read [Раздел 12.2, «Restriction of Key Combinations»](#) (стр. 152) for information about possible exceptions.

## Navigation among Buttons and Selection Lists

Use [Tab] to navigate among the buttons and frames containing selection lists. To navigate in reverse order, use [] + [Tab] or [] + [Tab] combinations.

## Navigation in Selection Lists

Use the arrow keys ([↑] and [↓]) to navigate among the individual elements in an active frame containing a selection list. If individual entries within a frame exceed its width, use [] + [→] or [] + [←] to scroll horizontally to the right and left. Alternatively, use [] + [E] or [] + [A]. This combination can also be used if using [→] or [←] results in changing the active frame or the current selection list, as in the Control Center.

## Buttons, Radio Buttons, and Check Boxes

To select buttons with empty square brackets (check boxes) or empty parentheses (radio buttons), press [Space] or []. Alternatively, radio buttons and check boxes can be selected directly with [] + [highlighted\_letter]. In this case, you do not need to confirm with []. If you navigate to an item with [Tab], press [] to execute the selected action or activate the respective menu item.

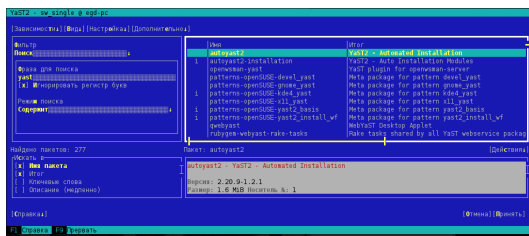
## Function Keys

The F keys ([F1] through [F12]) enable quick access to the various buttons. Available F key shortcuts are shown in the bottom line of the YaST screen. Which function keys are actually mapped to which buttons depend on the active YaST module, because the different modules offer different buttons (Details, Info, Add, Delete, etc.). Use [F10] for Accept, OK, Next, and Finish. Press [F1] to access the YaST help.

## Using Navigation Tree in ncurses Mode

Some YaST modules use a navigation tree in the left part of the window to select configuration dialogs. Use the arrow keys ([↑] and [↓]) to navigate in the tree. Use [Space] to open or close tree items. In ncurses mode, [] must be pressed after a selection in the navigation tree in order to show the selected dialog. This is an intentional behavior to save time consuming redraws when browsing through the navigation tree.

Рисунок 12.2 The Software Installation Module



## 12.2 Restriction of Key Combinations

If your window manager uses global [] combinations, the [] combinations in YaST might not work. Keys like [] or [] can also be occupied by the settings of the terminal.



Replacing `[]` with `[Esc]`

`[]` shortcuts can be executed with `[]` instead of `[Esc]`. For example, `[] - [H]` replaces `[] + [H]`. (First press `[]`, then press `[H]`.)

Backward and Forward Navigation with `[] + [F]` and `[] + [B]`

If the `[]` and `[]` combinations are occupied by the window manager or the terminal, use the combinations `[] + [F]` (forward) and `[] + [B]` (backward) instead.

Restriction of Function Keys

The F keys are also used for functions. Certain function keys might be occupied by the terminal and may not be available for YaST. However, the `[]` key combinations and function keys should always be fully available on a pure text console.

## 12.3 YaST Command Line Options

Besides the text mode interface, YaST provides a pure command line interface. To get a list of YaST command line options, enter:

```
yast -h
```

### 12.3.1 Starting the Individual Modules

To save time, the individual YaST modules can be started directly. To start a module, enter:

```
yast <module_name>
```

View a list of all module names available on your system with `yast -l` or `yast --list`. Start the network module, for example, with `yast lan`.

### 12.3.2 Installing Packages from the Command Line

If you know a package name and the package is provided by any of your active installation repositories, you can use the command line option `-i` to install the package:

```
yast -i <package_name>
```

or

```
yast --install <package_name>
```

*package\_name* can be a single short package name, for example `gvim`, which is installed with dependency checking, or the full path to an rpm package, which is installed without dependency checking.

If you need a command-line based software management utility with functionality beyond what YaST provides, consider using `zypper`. This new utility uses the same software management library that is also the foundation for the YaST package manager. The basic usage of `zypper` is covered in [Раздел 9.1, «Using Zypper»](#) (стр. 113).

### 12.3.3 Command Line Parameters of the YaST Modules

To use YaST functionality in scripts, YaST provides command line support for individual modules. Not all modules have command line support. To display the available options of a module, enter:

```
yast <module_name> help
```

If a module does not provide command line support, the module is started in text mode and the following message appears:

```
This YaST module does not support the command line interface.
```

## 13 Настройка устройств с помощью YaST

YaST позволяет настраивать оборудование во время установки, а также в уже установленной системе. Настроить аудиокарты, поддерживаемые принтеры и сканеры или узнать какое оборудование установлено, можно с помощью модулей YaST Информация об оборудовании.

---

ПОДСКАЗКА: Настройка видео карты, монитора, мыши и клавиатуры

Видео карта, монитор, мышь и клавиатура могут быть сконфигурированы с помощью инструментов KDE или GNOME.

---

### 13.1 Информация об оборудовании

Используйте модуль YaST Информация об оборудовании, если Вы хотите узнать больше о Вашем аппаратном обеспечении или, если Вам нужно узнать такие детали как поставщик и модель определенной части используемого оборудования.

- 1 Запустите YaST и нажмите Оборудование > Информация об оборудовании. Сразу запустится опрос оборудования — это займет некоторое время, по завершении которого будет отображено окно с информацией об установленных аппаратных средствах.
- 2 В древовидной структуре сведений об оборудовании нажмите на элемент, чтобы развернуть его и увидеть информацию о выбранном устройстве.
- 3 Нажмите Сохранить в файл..., чтобы сохранить полученную информацию в файл.
- 4 Нажмите Закрыть, чтобы закрыть это окно.

### 13.2 Установка звуковых карт

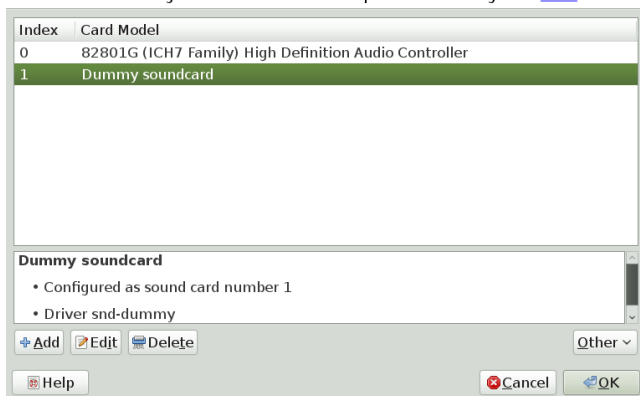
YaST самостоятельно определяет большинство звуковых карт и устанавливает для них подходящие настройки. Если нужно изменить настройки установленные автоматически или установить карту не настроенную автоматически — используйте модуль YaST Звук. Здесь можно также настроить дополнительные звуковые карты или изменить приоритет их использования.

Чтобы запустить модуль для работы со звуковыми картами откройте YaST и выберите Оборудование > Звук. Также, окно Настройка звука можно открыть вручную запустив в командой строке команду `yast2 sound &` от имени пользователя `root`.



## Sound Configuration

Select an unconfigured card from the list and press Edit to configure it. [more](#)



Здесь выводится список всех, уже настроенных, звуковых карт.

### Процедура 13.1 Настройка звуковой карты

Если была добавлена новая звуковая карта или YaST не может автоматически настроить существующую звуковую карту, то выполните следующие действия. Для настройки новой карты необходимо знать имя ее производителя и модель. Если есть сомнения относительно данной информации, то обратитесь к документации к вашей звуковой карте. Для получения списка поддерживаемых ALSA звуковых карт с указанием соответствующего модуля обратитесь к <http://www.alsa-project.org/main/index.php/Matrix:Main>.

Доступны следующие варианты установки:

#### Быстрая автоматическая установка

Вам не обязательно проделывать любые другие шаги настройки—звуковая карта будет настроена автоматически. Вы можете установить уровень громкости и любые другие параметры позже.

#### Обычная установка

Позволяет выставить уровень громкости звука и проиграть тестовый звук во время настройки.

#### Дополнительная настройка с возможностью изменения параметров

Только для специалистов. Позволяет настраивать все параметры звуковой карты.

---

## ВАЖНО: Расширенная настройка

Используйте эту опцию, только если вы точно знаете, что делаете. В противном случае не изменяйте параметры и используйте обычный или автоматический режим.

---

- 1 Запустите модуль YaST для настройки звуковой карты.
- 2 Для настройки обнаруженной, но еще не настроенной звуковой карты выберите соответствующую строку в списке карт и нажмите Редактировать.  
  
Для настройки новой звуковой карты нажмите Добавить. Выберите производителя и модель и нажмите Далее.
- 3 Выберите способ настройки и нажмите Далее.
- 4 При выборе Обычная установка будут доступны кнопка Тест для проверки сделанных настроек звуковой карты и бегунок для корректировки уровня громкости звука. Лучше начать примерно с десяти процентов громкости, чтобы избежать повреждения органов слуха или динамиков.
- 5 Если все параметры установлены правильно, то нажмите Далее.  
  
В диалоге Настройка звука будет показана новая или измененная звуковая карта.
- 6 Для удаления звуковой карты выберите нужную и нажмите Удалить.
- 7 Нажмите ОК, чтобы сохранить сделанные изменения и закрыть окно модуля YaST.

### Процедура 13.2 Изменение конфигурации звуковой карты

- 1 Для изменения конфигурации конкретной звуковой карты (только для опытных пользователей!) выберите нужную карту в диалоге Настройка звука и нажмите Редактировать.  
  
Откроется диалог Дополнительные параметры звуковой карты, где можно произвести тонкую настройку ряда параметров. Для получения дополнительной информации нажмите Справка.
- 2 Для регулировки громкости уже настроенной звуковой карты или для ее тестирования, выберите нужную карту в диалоге Настройка звука и нажмите Другое. Выберите нужный пункт меню.

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### ПРИМЕЧАНИЕ: Микшер YaST

Микшер YaST предоставляет только основные возможности. Они предназначены для устранения неполадок (например, если не слышно звука при тест карты). Получить доступ к настройкам микшера YaST можно из Другое > Громкость. Для повседневного использования и тонкой на-

стройки параметров звука используйте апплет используемого окружения рабочего стола или утилиту командной строки `alsasound`.

---

- 3 Для воспроизведения MIDI-файлов выберите Другое > Запустить секвенсор.
- 4 При обнаружении поддержки воспроизведения MIDI звуковой картой (как например, Creative Soundblaster Live, Audigy или AWE) можно установить SoundFonts:
  - 4a Вставьте CD-ROM с драйвером от производителя в CD- или DVD-привод.
  - 4b Выберите Другое > Установка SoundFonts для копирования SF2 SoundFonts™ на жесткий диск. SoundFonts будут сохранены в каталоге `/usr/share/sfbank/creative/`.
- 5 Если в системе настроено более одной звуковой карты, то можно изменить порядок их использования. Для установки звуковой карты как устройство вывода звука по умолчанию выберите нужную карту и нажмите Другое > Задать в качестве основной карты. Звуковое устройство с индексом 0 является устройством по умолчанию и используется для вывода звука системой и приложениями.
- 6 По умолчанию, использует звуковую систему PulseAudio. Она представляет собой уровень абстракции призванный помочь в смешивании различных аудио-поток, обходя возможные ограничения аппаратуры. Для включения или отключения PulseAudio нажмите Другое > Настройка PulseAudio.... Если включено, то демон PulseAudio будет использоваться для вывода звука. Отключите Поддержка PulseAudio в случае когда необходимо использовать что-то другое во всей системе.

Уровень громкости и конфигурации всех звуковых карт будут сохранены после нажатия на OK и закрытия модуля YaST. Настройки микшера будут сохранены в файл `/etc/asound.state`. Данные конфигурации ALSA дублируются в конец файла `/etc/modprobe.d/sound` и в файл `/etc/sysconfig/sound`.

## 13.3 Установка сканера

Вы можете настроить USB или SCSI сканер с помощью YaST. Пакет `sane-backends` содержит драйверы оборудования и другие программы необходимые для использования сканера. Сканеры использующие параллельный порт не поддерживаются в YaST. Если Вы являетесь обладателем МФУ HP, то обратитесь к [Раздел 13.3.1, «Конфигурирование МФУ устройств HP»](#) (стр. 159) инструкции по настройке сетевого сканера можно найти в [Раздел 13.3.3, «Сканирование по сети»](#) (стр. 160).

### Процедура 13.3 Настройка USB или SCSI сканера

- 1 Подключите USB или SCSI сканер к компьютеру и оставьте его включенным.

- 2 Запустите YaST и выберите Оборудование > Сканер. YaST создаст базу данных сканеров и попыбует определить модель вашего сканера автоматически.

Если USB или SCSI сканер не был определен, то попробуйте выполнить Другое > Повторное обнаружение.

- 3 Для активирования сканера выберите его из списка обнаруженных и нажмите Редактировать.
- 4 Выберите модель из списка и нажмите Далее и Завершить.
- 5 Используйте Другое > Тест для проверки правильности выбранного драйвера.
- 6 Закройте окно настройки нажатием на ОК.

### 13.3.1 Конфигурирование МФУ устройств HP

МФУ устройство HP может быть настроено с помощью YaST даже, если оно подключено к параллельному порту или является сетевым. Если МФУ подключен через USB интерфейс, то выполните его настройку как описано в [Процедура 13.3, «Настройка USB или SCSI сканера»](#) (стр. 158). Если устройство определилось правильно и Тест успешно выполнен, то оно готово к работе.

Если USB устройство не определилось автоматически или МФУ подключено через параллельный порт или по сети, то запустите HP Device Manager:

- 1 Запустите YaST и выберите Оборудование > Сканер. YaST загрузит базу данных известных моделей сканеров.
- 2 Запустите HP Device Manager с помощью меню Другое > Запустить hp-setup и следуйте инструкциям. После завершения работы HP Device Manager YaST автоматически запустит обнаружение подключенных устройств.
- 3 Запустите тест выбрав Другое > Тест.
- 4 Закройте окно настройки нажатием на ОК.

### 13.3.2 Предоставление общего доступа к сканеру по сети

позволяет совместно использовать сканер по сети. Чтобы сделать это, настройте сканер следующим образом:

- 1 Настройте сканер как описано в [Раздел 13.3, «Установка сканера»](#) (стр. 158).
- 2 Выберите Другое > Сканирование по сети....

- 3 Введите имена компьютеров клиентов (разделяя запятой) которым будет разрешено использование сканера в поле Настройки Сервера > Разрешенные клиенты для sane и закройте это окно нажав на ОК.

### 13.3.3 Сканирование по сети

Для использования сканера доступного через сети проделайте следующее:

- 1 Запустите YaST и выберите Оборудование > Сканер.
- 2 Откройте меню настройки сетевых сканеров Другие > Сканирование по сети....
- 3 Введите имя компьютера к которому подключен сканер в поле Настройки клиента > Сервера, используемые для метадрайвера net
- 4 Нажмите ОК. Сетевой сканер появится в списке окна настройки и будет готов к использованию.



## 14 Printer Operation

supports printing with many types of printers, including remote network printers. Printers can be configured manually or with YaST. For configuration instructions, refer to [Раздел 14.4, «Setting Up a Printer»](#) (стр. 163). Both graphical and command line utilities are available for starting and managing print jobs. If your printer does not work as expected, refer to [Раздел 14.8, «Troubleshooting»](#) (стр. 172).

CUPS (Common Unix Printing System) is the standard print system in .

Printers can be distinguished by interface, such as USB or network, and printer language. When buying a printer, make sure that the printer has an interface (like USB or parallel port) that is available on your hardware and a suitable printer language. Printers can be categorized on the basis of the following three classes of printer languages:

### PostScript Printers

PostScript is the printer language in which most print jobs in Linux and Unix are generated and processed by the internal print system. If PostScript documents can be processed directly by the printer and do not need to be converted in additional stages in the print system, the number of potential error sources is reduced.

### Standard Printers (Languages Like PCL and ESC/P)

Although these printer languages are quite old, they are still undergoing expansion to address new features in printers. In the case of known printer languages, the print system can convert PostScript jobs to the respective printer language with the help of Ghostscript. This processing stage is referred to as interpreting. The best-known languages are PCL (which is mostly used by HP printers and their clones) and ESC/P (which is used by Epson printers). These printer languages are usually supported by Linux and produce an adequate print result. Linux may not be able to address some special printer functions. Except for HP developing HPLIP (HP Linux Imaging and Printing), there are currently no printer manufacturers who develop Linux drivers and make them available to Linux distributors under an open source license.

### Proprietary Printers (Also Called GDI Printers)

These printers do not support any of the common printer languages. They use their own undocumented printer languages, which are subject to change when a new edition of a model is released. Usually only Windows drivers are available for these printers. See [Раздел 14.8.1, «Printers without Standard Printer Language Support»](#) (стр. 172) for more information.

Before you buy a new printer, refer to the following sources to check how well the printer you intend to buy is supported:

<http://www.linuxfoundation.org/OpenPrinting/>

The OpenPrinting home page with the printer database. The database shows the latest Linux support status. However, a Linux distribution can only integrate

the drivers available at production time. Accordingly, a printer currently rated as «perfectly supported» may not have had this status when the latest version was released. Thus, the databases may not necessarily indicate the correct status, but only provide an approximation.

<http://pages.cs.wisc.edu/~ghost/>  
The Ghostscript Web page.

`/usr/share/doc/packages/ghostscript-library/catalog.devices`  
List of included drivers.

## 14.1 The Workflow of the Printing System

The user creates a print job. The print job consists of the data to print plus information for the spooler, such as the name of the printer or the name of the printer queue, and optionally, information for the filter, such as printer-specific options.

At least one dedicated printer queue exists for every printer. The spooler holds the print job in the queue until the desired printer is ready to receive data. When the printer is ready, the spooler sends the data through the filter and back-end to the printer.

The filter converts the data generated by the application that is printing (usually PostScript or PDF, but also ASCII, JPEG, etc.) into printer-specific data (PostScript, PCL, ESC/P, etc.). The features of the printer are described in the PPD files. A PPD file contains printer-specific options with the parameters needed to enable them on the printer. The filter system makes sure that options selected by the user are enabled.

If you use a PostScript printer, the filter system converts the data into printer-specific PostScript. This does not require a printer driver. If you use a non-PostScript printer, the filter system converts the data into printer-specific data. This requires a printer driver suitable for your printer. The back-end receives the printer-specific data from the filter then passes it to the printer.

## 14.2 Methods and Protocols for Connecting Printers

There are various possibilities for connecting a printer to the system. The configuration of the CUPS print system does not distinguish between a local printer and a printer connected to the system over the network. For more information about the printer connection, read the article CUPS in a Nutshell in the Support Database at [http://en.opensuse.org/SDB:CUPS\\_in\\_a\\_Nutshell](http://en.opensuse.org/SDB:CUPS_in_a_Nutshell).

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**ПРЕДУПРЕЖДЕНИЕ:** Changing Cable Connections in a Running System

When connecting the printer to the machine, do not forget that only USB devices can be plugged in or unplugged during operation. To avoid damaging your system or printer, shut down the system before changing any connections that are not USB.

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## 14.3 Installing the Software

PPD (PostScript printer description) is the computer language that describes the properties, like resolution, and options, such as the availability of a duplex unit. These descriptions are required for using various printer options in CUPS. Without a PPD file, the print data would be forwarded to the printer in a «raw» state, which is usually not desired. During the installation of , many PPD files are preinstalled.

To configure a PostScript printer, the best approach is to get a suitable PPD file. Many PPD files are available in the package `manufacturer-PPDs`, which is automatically installed within the scope of the standard installation. See [Раздел 14.7.2, «PPD Files in Various Packages»](#) (стр. 170) and [Раздел 14.8.2, «No Suitable PPD File Available for a PostScript Printer»](#) (стр. 172).

New PPD files can be stored in the directory `/usr/share/cups/model/` or added to the print system with YaST as described in [Раздел 14.4.1.1, «Adding Drivers with YaST»](#) (стр. 165). Subsequently, the PPD file can be selected during the printer setup.

Be careful if a printer manufacturer wants you to install entire software packages. First, this kind of installation may result in the loss of the support provided by and second, print commands may work differently and the system may no longer be able to address devices of other manufacturers. For this reason, the installation of manufacturer software is not recommended.

## 14.4 Setting Up a Printer

YaST can be used to configure a local printer that is directly connected to your machine (normally with USB or parallel port) and to set up printing with network printers. It is also possible to share printers over the network. Further information about printing (general information, technical details, and troubleshooting) is available in [Глава 14, Printer Operation](#) (стр. 161).

In YaST, click Hardware > Printer to start the printer module. By default it opens in the Printer Configurations view, displaying a list of all printers that are available and configured. This is especially useful when having access to a lot of printers via the network. From here you can also Print a Test Page and configure local printers.

### 14.4.1 Configuring Local Printers

Usually a local USB printer is automatically detected. There are two possible reasons why a USB printer is not automatically detected:

- The USB printer is switched off.
- The communication between printer and computer is not possible. Check the cable and the plugs to make sure that the printer is properly connected. If this is the case, the problem may not be printer-related, but rather a USB related problem.

Configuring a printer is basically a three-step process. First specify the connection type, then choose a driver, and name the printing queue for this setup.

For many printer models, several drivers are available. When configuring the printer, YaST defaults to the one marked *recommended* as a general rule. Normally it is not necessary to change the driver—the *recommended* one should produce the best results. However, if you want a color printer to print only in black and white, it is most convenient to use a driver that does not support color printing, for example. If you experience performance problems with a PostScript printer when printing graphics, it may help to switch from a PostScript driver to a PCL driver (provided your printer understands PCL).

If no driver for your printer is listed, you can try to select a generic driver with an appropriate standard language from the list. Refer to your printer's documentation to find out which language (the set of commands controlling the printer) your printer understands. If this does not work, refer to [Раздел 14.4.1.1, «Adding Drivers with YaST»](#) (стр. 165) for another possible solution.

A printer is never used directly, but always through a print queue. This ensures that simultaneous jobs can be queued and processed one after the other. Each printer queue is assigned to a specific driver, and a printer can have multiple queues. This makes it possible to set up a second queue on a color printer that prints black and white only, for example. Refer to [Раздел 14.1, «The Workflow of the Printing System»](#) (стр. 162) for more information about print queues.

#### Процедура 14.1 Adding a New Local Printer

- 1 Start the YaST printer module with Hardware > Printer
- 2 Click Add in the Printer Configurations screen
- 3 If your printer is already listed under *Specify the Connection*, proceed with the next step. Otherwise, try to Detect More or start the Connection Wizard.
- 4 Enter the vendor name and the model name into the input box under *Find and Assign a Driver* and click Search for.
- 5 Choose the driver marked as recommended that best matches your printer. If no suitable drivers is displayed
  - 5a check your search term
  - 5b broaden your search by clicking Find More
  - 5c add a driver as described in [Раздел 14.4.1.1, «Adding Drivers with YaST»](#) (стр. 165)
- 6 Specify the *Default paper size*
- 7 Enter a unique name for the printer queue in the Set Arbitrary Name field.
- 8 The printer is now configured with the default settings and ready to use. Click OK to return to the Printer Configurations view. The newly configured printer is now visible in the printers list.

### 14.4.1.1 Adding Drivers with YaST

If no suitable driver is available in the Find and Assign a Driver dialog when adding a new printer, no PPD (PostScript Printer Description) file for your model is available. For more information about PPD files, refer to [Раздел 14.3, «Installing the Software»](#) (стр. 163).

Get PPD files directly from your printer vendor or from the driver CD of a PostScript printer. For details, see [Раздел 14.8.2, «No Suitable PPD File Available for a PostScript Printer»](#) (стр. 172). Conversely, you can also find PPD files at <http://www.linuxfoundation.org/en/OpenPrinting/>, the «OpenPrinting.org printer database». When downloading PPD files from OpenPrinting.org, keep in mind that it always shows the latest Linux support status, which is not necessarily met by .

#### Процедура 14.2 Adding a PPD file

- 1 Start the YaST printer module with Hardware > Printer
- 2 Click Add in the Printer Configurations screen
- 3 Click Driver Packages in the Find and Assign a Driver section
- 4 Enter the full path to the PPD file into the input box under Make a Printer Description File Available or choose the file from a dialog box by clicking on Browse
- 5 Click OK to return to the Add New Printer Configuration screen.
- 6 In order to directly use this PPD file, proceed as described in [Процедура 14.1, «Adding a New Local Printer»](#) (стр. 164). Otherwise, click Cancel.

### 14.4.1.2 Editing a Local Printer Configuration

By editing an existing configuration for a local printer you can not only change basic settings as connection type and driver, but also adjust the default settings for paper size, resolution, media source, etc. You can change the identifier of the printer by altering the printer descriptions.

#### Процедура 14.3 Editing a Local Printer

- 1 Start the YaST printer module with Hardware > Printer
- 2 In the Printer Configurations screen, choose a local printer from the list and click Edit.
- 3 Change the connection type or the driver as described in [Процедура 14.1, «Adding a New Local Printer»](#) (стр. 164). This should only be necessary in case you have problems with the current configuration.
- 4 Make this printer the default by checking Default Printer.

- 5 Adjust the default settings by clicking All Options for the Current Driver. To change a setting, expand the list of options by clicking the relative + sign. Change the default by clicking on an option. Apply your changes by clicking OK

## 14.4.2 Configuring Printing via the Network with YaST

Network printers are not detected automatically. They must be configured manually using the YaST printer module. Depending on your network setup, you can print to a print server (CUPS, LPD, SMB, or IPX) or directly to a network printer (preferably via TCP). Access the configuration view for network printing by choosing Printing via Network from the left pane in the YaST printer module.

### 14.4.2.1 Using CUPS

In a Linux environment CUPS is usually used to print via the network. The simplest setup is to only print via a single CUPS server which can directly be accessed by all clients. Printing via more than one CUPS server requires a running local CUPS daemon that communicates with the remote CUPS servers.

#### Процедура 14.4 Printing via a Single CUPS server

- 1 Start the YaST printer module with Hardware > Printer
- 2 Launch the Print via Network screen from the left pane.
- 3 Check Do All Your Printing Directly via One Single CUPS Server and specify the name or IP address of the server.
- 4 Click Test Server to make sure you have chosen the correct name or IP address.
- 5 Click OK to return to the Printer Configurations screen. All printers available via the CUPS server are now listed.

#### Процедура 14.5 Printing via multiple CUPS servers

- 1 Start the YaST printer module with Hardware > Printer
- 2 Launch the Print via Network screen from the left pane.
- 3 Check Accept Printer Announcements from CUPS Servers
- 4 Specify which servers to use under General Settings. You may accept connections from all networks available, from the local network, or from specific hosts. If you choose the latter option, you need to specify the hostnames or IP addresses, as well.
- 5 Confirm by clicking OK and then Yes when asked to start a local CUPS server. After the server has started you will return to the Printer Configurations screen. Click Refresh list to see the printers detected by now. Click this button again, in case more printer are to be available.

### 14.4.2.2 Using Print Servers other than CUPS

If your network offers print services via print servers other than CUPS, start the YaST printer module with Hardware > Printer and launch the Print via Network screen from the left pane. Start the Connection Wizard and choose the appropriate Connection type. Ask your network administrator for details on configuring a network printer in your environment.

### 14.4.3 Sharing Printers Over the Network

Printers managed by a local CUPS daemon can be shared over the network and so turn your machine into a CUPS server. Usually you share a printer by enabling CUPS' so-called «browsing mode». If browsing is enabled, the local printer queues are made available on the network for listening to remote CUPS daemons. It is also possible to set up a dedicated CUPS server that manages all printing queues and can directly be accessed by remote clients. In this case it is not necessary to enable browsing.

#### Процедура 14.6 Sharing Printers

- 1 Start the YaST printer module with Hardware > Printer
- 2 Launch the Share Printers screen from the left pane.
- 3 Select Allow Remote Access. For more detailed configuration, additional options are available:
  - Check For computers within the local network and enable browsing mode by also checking Publish printers by default within the local network.
  - Add the network interface to be used by the CUPS server. If you want to share your printers via specified network interfaces, add those in the input box below.
  - In case you like to restrict access to your CUPS server to certain networks or IP addresses, specify these via the two input boxes.
- 4 Click OK to restart the CUPS server and return to the Printer Configurations screen.
- 5 Regarding CUPS and firewall settings, see [http://en.opensuse.org/SDB:CUPS\\_and\\_SANE\\_Firewall\\_settings](http://en.opensuse.org/SDB:CUPS_and_SANE_Firewall_settings).

## 14.5 Network Printers

A network printer can support various protocols, some of them even concurrently. Although most of the supported protocols are standardized, some manufacturers modify the standard. Manufacturers then provide drivers for only a few operating systems. Unfortunately, Linux drivers are rarely provided. The current situation is such

that you cannot act on the assumption that every protocol works smoothly in Linux. Therefore, you may have to experiment with various options to achieve a functional configuration.

CUPS supports the `socket`, `LPD`, `IPP` and `smb` protocols.

#### socket

Socket refers to a connection in which the plain print data is sent directly to a TCP socket. Some of the socket port numbers that are commonly used are 9100 or 35. The device URI (uniform resource identifier) syntax is: `socket://IP.of.the.printer:port`, for example: `socket://192.168.2.202:9100/`.

#### LPD (Line Printer Daemon)

The LPD protocol is described in RFC 1179. Under this protocol, some job-related data, such as the ID of the printer queue, is sent before the actual print data is sent. Therefore, a printer queue must be specified when configuring the LPD protocol. The implementations of diverse printer manufacturers are flexible enough to accept any name as the printer queue. If necessary, the printer manual should indicate what name to use. LPT, LPT1, LP1 or similar names are often used. The port number for an LPD service is 515. An example device URI is `lpd://192.168.2.202/LPT1`.

#### IPP (Internet Printing Protocol)

IPP is a relatively new protocol (1999) based on the HTTP protocol. With IPP, more job-related data is transmitted than with the other protocols. CUPS uses IPP for internal data transmission. The name of the print queue is necessary to configure IPP correctly. The port number for IPP is 631. Example device URIs are `ipp://192.168.2.202/ps` and `ipp://192.168.2.202/printers/ps`.

#### SMB (Windows Share)

CUPS also supports printing on printers connected to Windows shares. The protocol used for this purpose is SMB. SMB uses the port numbers 137, 138 and 139. Example device URIs are `smb://user:password@workgroup/smb.example.com/printer`, `smb://user:password@smb.example.com/printer`, and `smb://smb.example.com/printer`.

The protocol supported by the printer must be determined before configuration. If the manufacturer does not provide the needed information, the command `nmap` (which comes with the `nmap` package) can be used to ascertain the protocol. `nmap` checks a host for open ports. For example:

```
nmap -p 35,137-139,515,631,9100-10000 printerIP
```

## 14.5.1 Configuring CUPS with Command Line Tools

CUPS can be configured with command line tools like `lpinfo`, `lpadmin` and `lpoptions`. You need a device URI consisting of a back-end, such as `parallel`, and parameters. To determine valid device URIs on your system use the command `lpinfo -v | grep "://"`:



```
# lpinfo -v | grep "://"
direct usb://ACME/FunPrinter%20XL
direct parallel:/dev/lp0
```

With `lpadmin` the CUPS server administrator can add, remove or manage print queues. To add a print queue, use the following syntax:

```
lpadmin -p queue -v device-URI -P PPD-file -E
```

Then the device (`-v`) is available as `queue` (`-p`), using the specified PPD file (`-P`). This means that you must know the PPD file and the device URI to configure the printer manually.

Do not use `-E` as the first option. For all CUPS commands, `-E` as the first argument sets use of an encrypted connection. To enable the printer, `-E` must be used as shown in the following example:

```
lpadmin -p ps -v parallel:/dev/lp0 -P \
/usr/share/cups/model/Postscript.ppd.gz -E
```

The following example configures a network printer:

```
lpadmin -p ps -v socket://192.168.2.202:9100/ -P \
/usr/share/cups/model/Postscript-level1.ppd.gz -E
```

For more options of `lpadmin`, see the man page of `lpadmin(8)`.

During printer setup, certain options are set as default. These options can be modified for every print job (depending on the print tool used). Changing these default options with YaST is also possible. Using command line tools, set default options as follows:

- 1 First, list all options:

```
lpoptions -p queue -l
```

Example:

```
Resolution/Output Resolution: 150dpi *300dpi 600dpi
```

The activated default option is identified by a preceding asterisk (\*).

- 2 Change the option with `lpadmin`:

```
lpadmin -p queue -o Resolution=600dpi
```

- 3 Check the new setting:

```
lpoptions -p queue -l
```

```
Resolution/Output Resolution: 150dpi 300dpi *600dpi
```

When a normal user runs `lpoptions`, the settings are written to `~/.cups/lpoptions`. However, root settings are written to `/etc/cups/lpoptions`.

## 14.6 Printing from the Command Line

To print from the command line, enter `lp -d queuefilename filename`, substituting the corresponding names for *queuefilename* and *filename*.

Some applications rely on the `lp` command for printing. In this case, enter the correct command in the application's print dialog, usually without specifying *filename*, for example, `lp -d queuefilename`.

## 14.7 Special Features in

A number of CUPS features have been adapted for . Some of the most important changes are covered here.

### 14.7.1 CUPS and Firewall

After having performed a default installation of , SuSEFirewall2 is active and the network interfaces are configured to be in the `External Zone` which blocks incoming traffic. More information about the SuSEFirewall2 configuration is available in Раздел "SuSEfirewall2" (Глава 13, Masquerading and Firewalls, ↑Руководство по безопасности) and at [http://en.opensuse.org/SDB:CUPS\\_and\\_SANE\\_Firewall\\_settings](http://en.opensuse.org/SDB:CUPS_and_SANE_Firewall_settings).

#### 14.7.1.1 CUPS Client

Normally, a CUPS client runs on a regular workstation located in a trusted network environment behind a firewall. In this case it is recommended to configure the network interface to be in the `Internal Zone`, so the workstation is reachable from within the network.

#### 14.7.1.2 CUPS Server

If the CUPS server is part of a trusted network environment protected by a firewall, the network interface should be configured to be in the `Internal Zone` of the firewall. It is not recommended to set up a CUPS server in an untrusted network environment unless you take care that it is protected by special firewall rules and secure settings in the CUPS configuration.

### 14.7.2 PPD Files in Various Packages

The YaST printer configuration sets up the queues for CUPS using the PPD files installed in `/usr/share/cups/model`. To find the suitable PPD files for the printer model, YaST compares the vendor and model determined during hardware detection with the vendors and models in all PPD files. For this purpose, the YaST printer configuration generates a database from the vendor and model information extracted from the PPD files.

The configuration using only PPD files and no other information sources has the advantage that the PPD files in `/usr/share/cups/model` can be modified freely. For example, if you only have PostScript printers, normally you do not need the Foomatic PPD files in the `cups-drivers` package or the Gutenprint PPD files in the `gutenprint` package. Instead, the PPD files for your PostScript printers can be copied directly to `/usr/share/cups/model` (if they do not already exist in the `manufacturer-PPDs` package) to achieve an optimum configuration for your printers.

#### 14.7.2.1 CUPS PPD Files in the `cups` Package

The generic PPD files in the `cups` package have been complemented with adapted Foomatic PPD files for PostScript level 1 and level 2 printers:

- `/usr/share/cups/model/Postscript-level1.ppd.gz`
- `/usr/share/cups/model/Postscript-level2.ppd.gz`

#### 14.7.2.2 PPD Files in the `cups-drivers` Package

Normally, the Foomatic printer filter `foomatic-rip` is used together with Ghostscript for non-PostScript printers. Suitable Foomatic PPD files have the entries `*NickName: ... Foomatic/Ghostscript driver` and `*cupsFilter: ... foomatic-rip`. These PPD files are located in the `cups-drivers` package.

YaST generally prefers a `manufacturer-PPD` file. However, when no suitable `manufacturer-PPD` file exists, a Foomatic PPD file with the entry `*NickName: ... Foomatic ...` (recommended) is selected.

#### 14.7.2.3 Gutenprint PPD Files in the `gutenprint` Package

Instead of `foomatic-rip`, the CUPS filter `rastertogutenprint` from Gutenprint (formerly known as GIMP-Print) can be used for many non-PostScript printers. This filter and suitable Gutenprint PPD files are available in the `gutenprint` package. The Gutenprint PPD files are located in `/usr/share/cups/model/gutenprint/` and have the entries `*NickName: ... CUPS+Gutenprint` and `*cupsFilter: ... rastertogutenprint`.

#### 14.7.2.4 PPD Files from Printer Manufacturers in the `manufacturer-PPDs` Package

The `manufacturer-PPDs` package contains PPD files from printer manufacturers that are released under a sufficiently liberal license. PostScript printers should be configured with the suitable PPD file of the printer manufacturer, because this file enables the use of all functions of the PostScript printer. YaST prefers a PPD file from the `manufacturer-PPDs`. YaST cannot use a PPD file from the `manufacturer-PPDs` package if the model name does not match. This may happen if

the `manufacturer-PPDs` package contains only one PPD file for similar models, like Funprinter 12xx series. In this case, select the respective PPD file manually in YaST.

## 14.8 Troubleshooting

The following sections cover some of the most frequently encountered printer hardware and software problems and ways to solve or circumvent these problems. Among the topics covered are GDI printers, PPD files and port configuration. Common network printer problems, defective printouts, and queue handling are also addressed.

### 14.8.1 Printers without Standard Printer Language Support

These printers do not support any common printer language and can only be addressed with special proprietary control sequences. Therefore they can only work with the operating system versions for which the manufacturer delivers a driver. GDI is a programming interface developed by Microsoft\* for graphics devices. Usually the manufacturer delivers drivers only for Windows, and since the Windows driver uses the GDI interface these printers are also called GDI printers. The actual problem is not the programming interface, but the fact that these printers can only be addressed with the proprietary printer language of the respective printer model.

Some GDI printers can be switched to operate either in GDI mode or in one of the standard printer languages. See the manual of the printer whether this is possible. Some models require special Windows software to do the switch (note that the Windows printer driver may always switch the printer back into GDI mode when printing from Windows). For other GDI printers there are extension modules for a standard printer language available.

Some manufacturers provide proprietary drivers for their printers. The disadvantage of proprietary printer drivers is that there is no guarantee that these work with the installed print system or that they are suitable for the various hardware platforms. In contrast, printers that support a standard printer language do not depend on a special print system version or a special hardware platform.

Instead of spending time trying to make a proprietary Linux driver work, it may be more cost-effective to purchase a printer which supports a standard printer language (preferably PostScript). This would solve the driver problem once and for all, eliminating the need to install and configure special driver software and obtain driver updates that may be required due to new developments in the print system.

### 14.8.2 No Suitable PPD File Available for a PostScript Printer

If the `manufacturer-PPDs` package does not contain a suitable PPD file for a PostScript printer, it should be possible to use the PPD file from the driver CD of the printer manufacturer or download a suitable PPD file from the Web page of the printer manufacturer.

If the PPD file is provided as a zip archive (.zip) or a self-extracting zip archive (.exe), unpack it with `unzip`. First, review the license terms of the PPD file. Then use the

`cupstestppd` utility to check if the PPD file complies with «Adobe PostScript Printer Description File Format Specification, version 4.3.» If the utility returns «FAIL,» the errors in the PPD files are serious and are likely to cause major problems. The problem spots reported by `cupstestppd` should be eliminated. If necessary, ask the printer manufacturer for a suitable PPD file.

## 14.8.3 Parallel Ports

The safest approach is to connect the printer directly to the first parallel port and to select the following parallel port settings in the BIOS:

- I/O address: 378 (hexadecimal)
- Interrupt: irrelevant
- Mode: Normal, SPP, or Output Only
- DMA: disabled

If the printer cannot be addressed on the parallel port despite these settings, enter the I/O address explicitly in accordance with the setting in the BIOS in the form 0x378 in `/etc/modprobe.conf`. If there are two parallel ports that are set to the I/O addresses 378 and 278 (hexadecimal), enter these in the form 0x378, 0x278.

If interrupt 7 is free, it can be activated with the entry shown in [Пример 14.1, «/etc/modprobe.conf: Interrupt Mode for the First Parallel Port»](#) (стр. 173). Before activating the interrupt mode, check the file `/proc/interrupts` to see which interrupts are already in use. Only the interrupts currently being used are displayed. This may change depending on which hardware components are active. The interrupt for the parallel port must not be used by any other device. If you are not sure, use the polling mode with `irq=none`.

**Пример 14.1** `/etc/modprobe.conf: Interrupt Mode for the First Parallel Port`

```
alias parport_lowlevel parport_pc
options parport_pc io=0x378 irq=7
```

## 14.8.4 Network Printer Connections

### Identifying Network Problems

Connect the printer directly to the computer. For test purposes, configure the printer as a local printer. If this works, the problems are related to the network.

### Checking the TCP/IP Network

The TCP/IP network and name resolution must be functional.

### Checking a Remote `lpd`

Use the following command to test if a TCP connection can be established to `lpd` (port 515) on `host`:

```
netcat -z host 515 && echo ok || echo failed
```

If the connection to `lpd` cannot be established, `lpd` may not be active or there may be basic network problems.

As the user `root`, use the following command to query a (possibly very long) status report for `queue` on remote `host`, provided the respective `lpd` is active and the host accepts queries:

```
echo -e "\004queue" \  
| netcat -w 2 -p 722 host 515
```

If `lpd` does not respond, it may not be active or there may be basic network problems. If `lpd` responds, the response should show why printing is not possible on the `queue` on `host`. If you receive a response like that shown in [Пример 14.2, «Error Message from lpd»](#) (стр. 174), the problem is caused by the remote `lpd`.

#### Пример 14.2 Error Message from lpd

```
lpd: your host does not have line printer access  
lpd: queue does not exist  
printer: spooling disabled  
printer: printing disabled
```

#### Checking a Remote cupsd

A CUPS network server can broadcast its queues by default every 30 seconds on UDP port 631. Accordingly, the following command can be used to test whether there is a broadcasting CUPS network server in the network. Make sure to stop your local CUPS daemon before executing the command.

```
netcat -u -l -p 631 & PID=$! ; sleep 40 ; kill $PID
```

If a broadcasting CUPS network server exists, the output appears as shown in [Пример 14.3, «Broadcast from the CUPS Network Server»](#) (стр. 174).

#### Пример 14.3 Broadcast from the CUPS Network Server

```
ipp://192.168.2.202:631/printers/queue
```

The following command can be used to test if a TCP connection can be established to `cupsd` (port 631) on `host`:

```
netcat -z host 631 && echo ok || echo failed
```

If the connection to `cupsd` cannot be established, `cupsd` may not be active or there may be basic network problems. `lpstat -h host -l -t` returns a (possibly very long) status report for all queues on `host`, provided the respective `cupsd` is active and the host accepts queries.

The next command can be used to test if the `queue` on `host` accepts a print job consisting of a single carriage-return character. Nothing should be printed. Possibly, a blank page may be ejected.

```
echo -en "\r" \  
| lp -d queue -h host
```

## Troubleshooting a Network Printer or Print Server Box

Spoolers running in a print server box sometimes cause problems when they have to deal with multiple print jobs. Since this is caused by the spooler in the print server box, there is no way to resolve this issue. As a work-around, circumvent the spooler in the print server box by addressing the printer connected to the print server box directly with the TCP socket. See [Раздел 14.5, «Network Printers»](#) (стр. 167).

In this way, the print server box is reduced to a converter between the various forms of data transfer (TCP/IP network and local printer connection). To use this method, you need to know the TCP port on the print server box. If the printer is connected to the print server box and turned on, this TCP port can usually be determined with the `nmap` utility from the `nmap` package some time after the print server box is powered up. For example, `nmap IP-address` may deliver the following output for a print server box:

Port	State	Service
23/tcp	open	telnet
80/tcp	open	http
515/tcp	open	printer
631/tcp	open	cups
9100/tcp	open	jetdirect

This output indicates that the printer connected to the print server box can be addressed via TCP socket on port 9100. By default, `nmap` only checks a number of commonly known ports listed in `/usr/share/nmap/nmap-services`. To check all possible ports, use the command `nmap -p from_port-to_port IP-address`. This may take some time. For further information, refer to the man page of `nmap`.

Enter a command like

```
echo -en "\rHello\r\f" | netcat -w 1 IP-address port
cat file | netcat -w 1 IP-address port
```

to send character strings or files directly to the respective port to test if the printer can be addressed on this port.

## 14.8.5 Defective Printouts without Error Message

For the print system, the print job is completed when the CUPS back-end completes the data transfer to the recipient (printer). If further processing on the recipient fails (for example, if the printer is not able to print the printer-specific data) the print system does not notice this. If the printer is not able to print the printer-specific data, select a PPD file that is more suitable for the printer.

## 14.8.6 Disabled Queues

If the data transfer to the recipient fails entirely after several attempts, the CUPS back-end, such as `usb` or `socket`, reports an error to the print system (to `cupsd`). The back-end determines how many unsuccessful attempts are appropriate until the data

transfer is reported as impossible. As further attempts would be in vain, `cupsd` disables printing for the respective queue. After eliminating the cause of the problem, the system administrator must reenables printing with the command `cupsenable`.

### 14.8.7 CUPS Browsing: Deleting Print Jobs

If a CUPS network server broadcasts its queues to the client hosts via browsing and a suitable local `cupsd` is active on the client hosts, the client `cupsd` accepts print jobs from applications and forwards them to the `cupsd` on the server. When `cupsd` on the server accepts a print job, it is assigned a new job number. Therefore, the job number on the client host is different from the job number on the server. As a print job is usually forwarded immediately, it cannot be deleted with the job number on the client host. This is because the client `cupsd` regards the print job as completed as soon as it has been forwarded to the server `cupsd`.

When it becomes desirable to delete the print job on the server, use a command such as `lpstat -h cups.example.com -o` to determine the job number on the server, provided the server has not already completed the print job (that is, sent it completely to the printer). Using this job number, the print job on the server can be deleted:

```
cancel -h cups.example.com queue-jobnumber
```

### 14.8.8 Defective Print Jobs and Data Transfer Errors

If you switch the printer off or shut down the computer during the printing process, print jobs remain in the queue. Printing resumes when the computer (or the printer) is switched back on. Defective print jobs must be removed from the queue with `cancel`.

If a print job is defective or an error occurs in the communication between the host and the printer, the printer prints numerous sheets of paper with unintelligible characters, because it is unable to process the data correctly. To rectify this situation, follow these steps:

- 1 To stop printing, remove all paper from ink jet printers or open the paper trays of laser printers. High-quality printers have a button for canceling the current printout.
- 2 The print job may still be in the queue, because jobs are only removed after they are sent completely to the printer. Use `lpstat -o` or `lpstat -h cups.example.com -o` to check which queue is currently printing. Delete the print job with `cancel queue-jobnumber` or `cancel -h cups.example.com queue-jobnumber`.
- 3 Some data may still be transferred to the printer even though the print job has been deleted from the queue. Check if a CUPS back-end process is still running for the respective queue and terminate it. For example, for a printer connected to the parallel port, the command `fuser -k /dev/lp0` can be used to terminate all processes that are still accessing the printer (more precisely: the parallel port).



- 4 Reset the printer completely by switching it off for some time. Then insert the paper and turn on the printer.

## 14.8.9 Debugging the CUPS Print System

Use the following generic procedure to locate problems in the CUPS print system:

- 1 Set `LogLevel debug` in `/etc/cups/cupsd.conf`.
- 2 Stop `cupsd`.
- 3 Remove `/var/log/cups/error_log*` to avoid having to search through very large log files.
- 4 Start `cupsd`.
- 5 Repeat the action that led to the problem.
- 6 Check the messages in `/var/log/cups/error_log*` to identify the cause of the problem.

## 14.8.10 For More Information

Solutions to many specific problems are presented in the SUSE Support Database ([http://en.opensuse.org/Portal:Support\\_database](http://en.opensuse.org/Portal:Support_database)). Locate the relevant articles with a text search for `SDB:CUPS`.



## 15 Установка и задание параметров шрифтов в графическом интерфейсе пользователя

Процедура установка дополнительных шрифтов является крайне простой. Просто скопируйте шрифты в любую поддиректорию каталога шрифтов X11 . Для активации использования шрифтов, новый каталог должен находиться в директориях указанных в `/etc/fonts/fonts.conf` или добавлен в файле `/etc/fonts/suse-font-dirs.conf`.

Ниже приводится отрывок из файла `/etc/fonts/fonts.conf`. Этот файл представляет собой стандартную конфигурацию, которая должна подходить для большинства систем. В нем также заданы подключаемые каталоги `/etc/fonts/conf.d`. В этом каталоге все файлы или символические ссылки, имена которых начинаются с двух цифр, будут загружены `fontconfig`. Для получения дополнительной информации обратитесь к `/etc/fonts/conf.d/README`.

```
<!-- Font directory list -->
<dir>/usr/share/fonts</dir>
<dir>/usr/X11R6/lib/X11/fonts</dir>
<dir>/opt/kde3/share/fonts</dir>
<dir>/usr/local/share/fonts</dir>
<dir>~/ .fonts</dir>
```

Файл `/etc/fonts/suse-font-dirs.conf` генерируется автоматически, чтобы задействовать шрифты поставляющиеся вместе с приложения (в основном третьими лицами), например, такими как OpenOffice.org, Java и Adobe Acrobat Reader. Типичная запись будет выглядеть следующим образом:

```
<dir>/usr/lib/Adobe/Reader9/Resource/Font</dir>
<dir>/usr/lib/Adobe/Reader9/Resource/Font/PFM</dir>
```

## 15.1 Добавление шрифтов

Для установки дополнительных шрифтов для всей системы, скопировать файлы шрифтов вручную в нужный каталог (как `root`), например, в `/usr/share/fonts/truetype`. Кроме того, эта задача может быть выполнена средствами установки шрифтов KDE в приложении Параметры системы. Результат будет тем же.

Вместо того, чтобы копировать сами шрифты, можно создавать символические ссылки на них. Например, так можно сделать, если вы приобрели лицензию на шрифты установленные на разделе с Windows и хотите их использовать. Затем, запустите `SuSEconfig --module fonts`.

`SuSEconfig --module fonts` выполнит скрипт `/usr/sbin/fonts-config`, который обработает настройки шрифтов. За дополнительной информацией об этом скрипте обратитесь к ее man-странице (`man fonts-config`).

Эта процедура одинакова для всех типов: растровых, TrueType и OpenType, а также Type 1 (PostScript) шрифтов. Все эти типы шрифтов можно устанавливать в любой каталог известный `fonts-config`.

## 16 Upgrading the System and System Changes

You can upgrade an existing system without completely reinstalling it. There are two types of renewing the system or parts of it: updating individual software packages and upgrading the entire system. Updating individual packages is covered in [Глава 5, Installing or Removing Software](#) (стр. 81) and [Глава 6, YaST Online Update](#) (стр. 101). Two ways to upgrade the system are discussed in the following sections— see [Раздел 16.1.3, «Upgrading with YaST»](#) (стр. 182) and [Раздел 16.1.4, «Distribution Upgrade with zypper»](#) (стр. 183).

### 16.1 Upgrading the System

Software tends to «grow» from version to version. Therefore, take a look at the available partition space with `df` before updating. If you suspect you are running short of disk space, secure your data before you update and repartition your system. There is no general rule regarding how much space each partition should have. Space requirements depend on your particular partitioning profile, the software selected, and the version numbers of the system.

#### 16.1.1 Preparations

Before upgrading, copy the old configuration files to a separate medium (such as removable hard disk or USB flash drive) to secure the data. This primarily applies to files stored in `/etc` as well as some of the directories and files in `/var`. You may also want to write the user data in `/home` (the HOME directories) to a backup medium. Backup this data as `root`. Only `root` has read permission for all local files.

Before starting your update, make note of the root partition. The command `df /` lists the device name of the root partition. In [Пример 16.1, «List with df -h»](#) (стр. 181), the root partition to write down is `/dev/sda3` (mounted as `/`).

##### Пример 16.1 List with df -h

Filesystem	Size	Used	Avail	Use%	Mounted on
<code>/dev/sda3</code>	74G	22G	53G	29%	<code>/</code>
<code>udev</code>	252M	124K	252M	1%	<code>/dev</code>
<code>/dev/sda5</code>	116G	5.8G	111G	5%	<code>/home</code>
<code>/dev/sda1</code>	39G	1.6G	37G	4%	<code>/windows/C</code>
<code>/dev/sda2</code>	4.6G	2.6G	2.1G	57%	<code>/windows/D</code>

#### 16.1.2 Possible Problems

If you upgrade a default system from the previous version to this version, YaST works out the necessary changes and performs them. Depending on your customizations, some steps (or the entire upgrade procedure) may fail and you must resort to copying back your backup data. Check the following issues before starting the system update.

### 16.1.2.1 Checking passwd and group in /etc

Before upgrading the system, make sure that `/etc/passwd` and `/etc/group` do not contain any syntax errors. For this purpose, start the verification utilities `pwck` and `grpck` as `root` to eliminate any reported errors.

### 16.1.2.2 PostgreSQL

Before updating PostgreSQL (`postgres`), dump the databases. See the manual page of `pg_dump`. This is only necessary if you actually used PostgreSQL prior to your update.

## 16.1.3 Upgrading with YaST

Following the preparation procedure outlined in [Раздел 16.1.1, «Preparations»](#) (стр. 181), you can now upgrade your system:

- 1 Boot the system as for the installation, described in [Раздел “System Start-Up for Installation”](#) (Глава 1, Installation with YaST, ↑Содержание). In YaST, choose a language and select Update in the Installation Mode dialog. Do not select New Installation. Also add repositories to make sure to get all available software updated whenever possible. Find more information about installation repositories in [Раздел “Add-On Products”](#) (Глава 1, Installation with YaST, ↑Содержание).
- 2 YaST determines if there are multiple root partitions. If there is only one, continue with the next step. If there are several, select the right partition and confirm with Next (`/dev/sda3` was selected in the example in [Раздел 16.1.1, «Preparations»](#) (стр. 181)). YaST reads the old `fstab` on this partition to analyze and mount the file systems listed there.

---

#### ПРЕДУПРЕЖДЕНИЕ: Persistent Device Names

All entries in `/etc/fstab` that specify partitions to be mounted using the kernel-device name must be changed to any of the other supported methods prior to performing an update. Kernel-device names are not persistent and are therefore unreliable for use during the update process. This can be done using the YaST System Partitioner by changing the method used in the `fstab` options settings.

---

- 3 Check the previously used repositories, if there are any. Enable all the repositories you still want to use and from where you want to update third-party software. Click the Toggle Status for every list item, if appropriate.
- 4 If you added repositories during the upgrade procedure as recommended above, you now can activate those you are actually interested in.
- 5 In the Installation Settings dialog, adjust the settings according to your requirements. Normally, you can leave the default settings untouched. If you intend to enhance your system, however, check the packages and patterns

offered in the Packages and Update Options submenus, or add support for additional languages.

You also have the possibility to make backups of various system components. Selecting backups slows down the upgrade process. Use this option if you do not have a recent system backup.

#### 6 Confirm the upgrade by clicking Start Update.

Once the basic upgrade installation is finished, YaST reboots the system. Finally, YaST updates the remaining software, if any and displays the release notes, if wanted.

## 16.1.4 Distribution Upgrade with zypper

With the `zypper` command line utility you can upgrade to the next version of the distribution. Most importantly, you can initiate the system upgrade process from within the running system.

This feature is attractive for advanced users who want to run remote upgrades or upgrades on many similarly configured systems. Inexperienced users will prefer the upgrade with YaST using a boot medium as described in [Раздел 16.1.3, «Upgrading with YaST»](#) (стр. 182).

### 16.1.4.1 Before Starting the Upgrade with zypper

To avoid unexpected errors during the upgrade process using `zypper`, minimize risky constellations.

Upgrade from the previous version (e.g., 11.3) to this version (11.4)—do not skip any minor version inbetween (this means, do not upgrade from 11.2 or earlier to 11.4 in one go). Make sure all available 11.3 online updates are successfully applied.

Close as many applications and unneeded services as possible and log out all regular users.

Disable third party or Open Build Service repositories before starting the upgrade, or lower the priority of these repositories to make sure packages from the default system repositories will get preference. Enable them again after the upgrade and edit their version string to match the version number of the distribution of the upgraded now running system.

For more information, see [http://en.opensuse.org/SDB:System\\_upgrade](http://en.opensuse.org/SDB:System_upgrade).

### 16.1.4.2 The Upgrade Procedure

---

#### ПРЕДУПРЕЖДЕНИЕ: Check Your System Backup

Before actually starting the upgrade procedure, check that your system backup is up-to-date and restorable. This is especially important because you must enter many of the following steps manually.

---

- 1 Run the online update to make sure the software management stack is up-to-date. For more information, see [Глава 6, YaST Online Update](#) (стр. 101).
- 2 Configure the repositories you want to use as an update source. Getting this right is essential. Either use YaST (see [Раздел 5.4, «Managing Software Repositories and Services»](#) (стр. 92)) or `zypper` (see [Раздел 9.1, «Using Zypper»](#) (стр. 113)). The name of the repositories as used in the following steps could vary a little bit depending on your customizations.

To view your current repositories enter:

```
zypper lr -u
```

---

#### ПОДСКАЗКА: `zypper` command names

`zypper` supports long and short command names. For example, you can abbreviate `zypper install` as `zypper in`. In the following text, the short variant is used.

---

- 2a Increase the version number of the system repositories from 11.3 to 11.4; add the new 11.4 repositories with commands such as:

```
server=http://download.opensuse.org
new_ver=11.4
zypper ar $server/distribution/$new_ver/repo/oss/
openSUSE-$new_ver-Oss
zypper ar $server/update/$new_ver/ openSUSE-
$new_ver-Update
```

And remove the old repositories:

```
old_ver=11.3
zypper rr openSUSE-$old_ver-Oss
zypper rr openSUSE-$old_ver-Update
```

- 2b Disable third party repositories or other Open Build Service repositories, because `zypper dup` is guaranteed to work with the default repositories only (replace `repo-alias` with the name of the repository you want to disable):

```
zypper mr -d repo-alias
```

Alternatively, you can lower the priority of these repositories.

---

#### ПРИМЕЧАНИЕ: Handling of Unresolved Dependencies

`zypper dup` will remove all packages having unresolved dependencies, but it keeps packages of disabled repositories as long as their dependencies are satisfied.

---



`zypper dup` ensures that all installed packages come from one of the available repositories. It does not consider the version, architecture, or vendor of the installed packages; thus it emulates a fresh installation. Packages that are no longer available in the repositories are considered orphaned. Such packages get uninstalled if their dependencies can not be satisfied. If they can be satisfied, such packages stay installed.

2c Once done, check your repository configuration with:

```
zypper lr -d
```

- 3 Refresh local metadata and repository contents with `zypper ref`.
- 4 Pull in zypper and the package management stack from the 11.4 repository with `zypper up zypper`.
- 5 Run the actual distribution upgrade with `zypper dup`. You are asked to confirm the license.
- 6 Perform basic system configuration with `SuSEconfig`.
- 7 Reboot the system with `shutdown -r now`.

## 16.1.5 Updating Individual Packages

Regardless of your overall updated environment, you can always update individual packages. From this point on, however, it is your responsibility to ensure that your system remains consistent.

Use the YaST software management tool to update packages as described in [Глава 5, Installing or Removing Software](#) (стр. 81). Select components from the YaST package selection list according to your needs. If a newer version of a package exists, the version numbers of the installed and the available versions are listed in blue color in the Installed (Available) column. If you select a package essential for the overall operation of the system, YaST issues a warning. Such packages should be updated only in the update mode. For example, many packages contain shared libraries. Updating these programs and applications in the running system may lead to system instability.

## 16.2 For More Information

Problems and special issues of the various versions are published online as they are identified. See the links listed below. Important updates of individual packages can be accessed using the YaST Online Update. For more information, see [Глава 6, YaST Online Update](#) (стр. 101).

Refer to the Product highlights ([http://en.opensuse.org/Product\\_highlights](http://en.opensuse.org/Product_highlights)) and the Bugs article in the openSUSE wiki at

[http://en.opensuse.org/openSUSE:Most\\_annoying\\_bugs](http://en.opensuse.org/openSUSE:Most_annoying_bugs) for information about recent changes and issues.

## Часть IV. Оболочка Bash



## 17 Shell Basics

When working with Linux these days, you can communicate with the system almost without ever requiring a command line interpreter (the shell). After booting your Linux system, you are usually directed to a graphical user interface that guides you through the login process and the following interactions with the operating system. The graphical user interface in Linux (the X Window System or X11) is initially configured during installation. Both KDE and GNOME desktop (and other window managers you can install) use it for interaction with the user.

Nevertheless, it is useful to have some basic knowledge of working with a shell because you might encounter situations where the graphical user interface is not available. For example, if some problem with the X Window System occurs. If you are not familiar with a shell, you might feel a bit uncomfortable at first when entering commands, but the more you get used to it, the more you will realize that the command line is often the quickest and easiest way to perform some daily tasks.

For UNIX or Linux several shells are available which differ slightly in behavior and in the commands they accept. The default shell in is Bash (GNU Bourne-Again Shell).

The following sections will guide you through your first steps with the Bash shell and will show you how to complete some basic tasks via the command line. If you are interested in learning more or rather feel like a shell «power user» already, refer to [Глава 18, Bash and Bash Scripts](#) (стр. 221).

### 17.1 Starting a Shell

Basically, there are two different ways to start a shell from the graphical user interface which usually shows after you have booted your computer:

- you can leave the graphical user interface or
- you can start a terminal window within the graphical user interface.

While the first option is always available, you can only make use of the second option when you are already logged in to a desktop such as KDE or GNOME. Whichever way you choose, there is always a way back and you can switch back and forth between the shell and the graphical user interface.

If you want to give it a try, press `Alt + F2` to leave the graphical user interface. The graphical user interface disappears and you are taken to a shell which prompts you to log in. Type your username and press `Enter`. Then type your password and press `Enter`. The prompt now changes and shows some useful information as in the following example:

```
❶ ❷ ❸  
tux@linux:~>
```

- ❶ Your login.



```
tux@knox:~> ls
bin Desktop Documents public_html tux.txt
tux@knox:~>
```

Files in Linux may have a file extension or a suffix, such as `.txt`, but do not need to have one. This makes it difficult to differentiate between files and folders in this output of the `ls`. By default, the colors in the Bash shell give you a hint: directories are usually shown in blue, files in black.

## 17.2.2 Using Commands with Options

A better way to get more details about the contents of a directory is using the `ls` command with a string of options. Options modify the way a command works so that you can get it to carry out specific tasks. Options are separated from the command with a blank and are usually prefixed with a hyphen. The `ls -l` command shows the contents of the same directory in full detail (long listing format):

```
tux@knox:~> ls -l
drwxr-xr-x 1 tux users      48 2006-06-23 16:08 bin
drwx---r-- 1 tux users  53279 2006-06-21 13:16 Desktop
drwx----- 1 tux users    280 2006-06-23 16:08 Documents
drwxr-xr-x 1 tux users  70733 2006-06-21 09:35 public_html
-rw-r--r-- 1 tux users  47896 2006-06-21 09:46 tux.txt
tux@knox:~>
```

This output shows the following information about each object:

```
drwxr-xr-x❶❷ tux❸ users❹❺ 48❻ 2006-06-23 16:08❼ bin❼
```

- ❶ Type of object and access permissions. For further information, refer to [Раздел 17.5.1, «Permissions for User, Group and Others»](#) (стр. 198).
- ❷ Number of hard links to this file.
- ❸ Owner of the file or directory. For further information, refer to [Раздел 17.5.1, «Permissions for User, Group and Others»](#) (стр. 198).
- ❹ Group assigned to the file or directory. For further information, refer to [Раздел 17.5.1, «Permissions for User, Group and Others»](#) (стр. 198).
- ❺ File size in bytes.
- ❻ Date and time of the last change.
- ❼ Name of the object.

Usually, you can combine several options by prefixing only the first option with a hyphen and then write the others consecutively without a blank. For example, if you want to see all files in a directory in long listing format, you can combine the two options `-l` and `-a` (show all files) for the `ls` command. Executing `ls -la` shows also hidden files in the directory, indicated by a dot in front (for example, `.hiddenfile`).

The list of contents you get with `ls` is sorted alphabetically by filenames. But like in a graphical file manager, you can also sort the output of `ls -l` according to various criteria such as date, file extension or file size:

- For date and time, use `ls -lt` (displays newest first).
- For extensions, use `ls -lx` (displays files with no extension first).
- For file size, use `ls -lS` (displays largest first).

To revert the order of sorting, add `-r` as an option to your `ls` command. For example, `ls -lr` gives you the contents list sorted in reverse alphabetical order, `ls -ltr` shows the oldest files first. There are lots of other useful options for `ls`. In the following section you will learn how to investigate them.

## 17.2.3 Getting Help

Nobody is expected to know all options of all commands by heart. If you remember the command name but are not sure about the options or the syntax of the command, choose one of the following possibilities:

### `--help` option

If you only want to look up the options of a certain command, try entering the command followed by a space and `--help`. This `--help` option exists for many commands. For example, `ls --help` displays all the options for the `ls` command.

### Manual Pages

To learn more about the various commands, you can also use the manual pages. Manual pages also give a short description of what the command does. They can be accessed with `man` followed by the name of the command, for example, `man ls`.

The man pages are displayed directly in the shell. To navigate them, move up and down with `↑` and `↓`. Move between the beginning and the end of a document with `⏪` and `⏩`. End this viewing mode by pressing `[Q]`. Learn more about the `man` command itself with `man man`.

### Info Pages

Info pages usually provide even more information about commands. To view the info page for a certain command, enter `info` followed by the name of the command (for example, `info ls`). You can browse an info page with a viewer directly in the shell and display the different sections, called «nodes.» Use `⏪` to move forward and `⏩` to move backwards. Within a node, you can also browse with `⏪` and `⏩` but only `⏪` and `⏩` will take you also to the previous or subsequent node. Like for the man pages, press `[Q]` to end the viewing mode.

Note that man pages and info pages do not exist for all commands. Sometimes both are available (usually for key commands), sometimes only a man page or an info page exists, and sometimes neither of them are available.

## 17.2.4 Bash Shortcut Keys

After having entered several commands, your shell will begin to fill up with all sorts of commands and the corresponding outputs. In the following table, find some useful shortcut keys for navigating and editing in the shell.



Shortcut Key	Function
<code>⌘ + [L]</code>	Clears the screen and moves the current line to the top of the page.
<code>⌘ + [C]</code>	Aborts the command which is currently being executed.
<code>⌘ + ⌵</code>	Scrolls upwards.
<code>⌘ + ⌴</code>	Scrolls downwards.
<code>⌘ + [U]</code>	Deletes from cursor position to start of line.
<code>⌘ + [K]</code>	Deletes from cursor position to the end of line.
<code>⌘ + [D]</code>	Closes the shell session.
<code>⌘, ⌵</code>	Browses in the history of executed commands.

## 17.3 Working with Files and Directories

To address a certain file or directory, you must specify the path leading to that directory or file. As you may know from MS DOS or Mac OS already, there are two ways to specify a path:

### Absolute Path

Enter the entire path from the root directory to the relevant file or directory.

### Relative Path

Enter a path to the relevant file or directory by using the current directory as a starting point. This implies to give the levels you have to move up or down in the file system tree to reach the target directory of file, starting from the current directory.

Paths contain filenames, directories or both, separated by slashes. Absolute paths always start with a slash. Relative paths do not have a slash at the beginning, but can have one or two dots.

When entering commands, you can choose either way to specify a path, depending on your preferences or the amount of typing, both will lead to the same result. To change directories, use the `cd` command and specify the path to the directory.

If a filename or the name of a directory contains a space, either escape the space using a back slash (\) in front of the blank or enclose the filename in single quotes. Otherwise Bash interprets a filename like `My Documents` as the names of two files or directories, `My` and `Documents` in this case.

---

When specifying paths, the following «shortcuts» can save you a lot of typing:

- The tilde symbol (~) is a shortcut for home directories. For example, to list the contents of your home directory, use `ls ~`. To list the contents of another user's home directory, enter `ls ~username` (or course, this will only work if you have permission to view the contents, see [Раздел 17.5, «File Access Permissions»](#) (стр. 198)). For example, entering `ls ~tux` would list the contents of the home directory of a user named `tux`. You can use the tilde symbol as shortcut for home directories also if you are working in a network environment where your home directory may not be called `/home` but can be mapped to any directory in the file system.

From anywhere in the file system, you can reach your home directory by entering `cd ~` or by simply entering `cd` without any options.

- When using relative paths, refer to the current directory with a dot (.). This is mainly useful for commands such as `cp` or `mv` by which you can copy or move files and directories.
- The next higher level in the tree is represented by two dots (..). In order to switch to the parent directory of your current directory, enter `cd ..`, to go up two levels from the current directory enter `cd ../../` etc.

To apply your knowledge, find some examples below. They address basic tasks you may want to execute with files or folders using Bash.

### 17.3.1 Examples for Working with Files and Directories

Suppose you want to copy a file located somewhere in your home directory to a subdirectory of `/tmp` that you need to create first.

#### Процедура 17.1 Creating and Changing Directories

From your home directory create a subdirectory in `/tmp`:

1 Enter

```
mkdir /tmp/test
```

`mkdir` stands for «make directory». This command creates a new directory named `test` in the `/tmp` directory. In this case, you are using an absolute path to create the `test` directory.

- 2 To check what happened, now enter

```
ls -l /tmp
```

The new directory `test` should appear in the list of contents of the `/tmp` directory.

- 3 Switch to the newly created directory with

```
cd /tmp/test
```

## Процедура 17.2 Creating and Copying Files

Now create a new file in a subdirectory of your home directory and copy it to `/tmp/test`. Use a relative path for this task.

---

### БАЖХО: Overwriting of Existing Files

Before copying, moving or renaming a file, check if your target directory already contains a file with the same name. If yes, consider changing one of the filenames or use `cp` or `mv` with options like `-i`, which will prompt before overwriting an existing file. Otherwise Bash will overwrite the existing file without confirmation.

---

- 1 To list the contents of your home directory, enter

```
ls -l ~
```

It should contain a subdirectory called `Documents` by default. If not, create this subdirectory with the `mkdir` command you already know:

```
mkdir ~/Documents
```

- 2 To create a new, empty file named `myfile.txt` in the `Documents` directory, enter

```
touch ~/Documents/myfile.txt
```

Usually, the `touch` command updates the modification and access date for an existing file. If you use `touch` with a filename which does not exist in your target directory, it creates a new file.

- 3 Enter

```
ls -l ~/Documents
```

The new file should appear in the list of contents.

- 4 To copy the newly created file, enter

```
cp ~/Documents/myfile.txt .
```

Do not forget the dot at the end.

This command tells Bash to go to your home directory and to copy `myfile.txt` from the `Documents` subdirectory to the current directory, `/tmp/test`, without changing the name of the file.

- 5 Check the result by entering

```
ls -l
```

The file `myfile.txt` should appear in the list of contents for `/tmp/test`.

### Процедура 17.3 Renaming and Removing Files or Directories

Now suppose you want to rename `myfile.txt` into `tuxfile.txt`. Finally you decide to remove the renamed file and the `test` subdirectory.

- 1 To rename the file, enter

```
mv myfile.txt tuxfile.txt
```

- 2 To check what happened, enter

```
ls -l
```

Instead of `myfile.txt`, `tuxfile.txt` should appear in the list of contents.

`mv` stands for `move` and is used with two options: the first option specifies the source, the second option specifies the target of the operation. You can use `mv` either

- to rename a file or a directory,
- to move a file or directory to a new location or
- to do both in one step.

- 3 Coming to the conclusion that you do not need the file any longer, you can delete it by entering

```
rm tuxfile.txt
```

Bash deletes the file without any confirmation.

- 4 Move up one level with `cd ..` and check with

```
ls -l test
```

if the `test` directory is empty now.

- 5 If yes, you can remove the `test` directory by entering

```
rmdir test
```

## 17.4 Becoming Root

`root`, also called the superuser, has privileges which authorize him to access all parts of the system and to execute administrative tasks. He or she has the unrestricted capacity to make changes to the system and has unlimited access to all files. Therefore performing some administrative tasks or running certain programs such as YaST requires `root` permissions.

## 17.4.1 Using su

In order to temporarily become `root` in a shell, proceed as follows:

- 1 Enter `su`. You are prompted for the `root` password.
- 2 Enter the password. If you mistyped the `root` password, the shell displays a message. In this case, you have to re-enter `su` before retyping the password. If your password is correct, a hash symbol `#` appears at the end of the prompt, signaling that you are acting as `root` now.
- 3 Execute your task. For example, transfer ownership of a file to a new user which only `root` is allowed to do:  

```
chown wilber kde_quick.xml
```
- 4 After having completed your tasks as `root`, switch back to your normal user account. To do so, enter  

```
exit
```

The hash symbol disappears and you are acting as «normal» user again.

## 17.4.2 Using sudo

Alternatively, you can also use `sudo` (superuser «do») to execute some tasks which normally are for `roots` only. With `sudo`, administrators can grant certain users `root` privileges for some commands. Depending on the system configuration, users can then run `root` commands by entering their normal password only. Due to a timestamp function, users are only granted a «ticket» for a restricted period of time after having entered their password. The ticket usually expires after a few minutes. In openSUSE, `sudo` requires the `root` password by default (if not configured otherwise by your system administrator).

For users, `sudo` is convenient as it prevents you from switching accounts twice (to `root` and back again). To change the ownership of a file using `sudo`, only one command is necessary instead of three:

```
sudo chown wilber kde_quick.xml
```

After you have entered the password which you are prompted for, the command is executed. If you enter a second `root` command shortly after that, you are not prompted for the password again, because your ticket is still valid. After a certain amount of time, the ticket automatically expires and the password is required again. This also prevents unauthorized persons from gaining `root` privileges in case a user forgets to switch back to his normal user account again and leaves a `root` shell open.

## 17.5 File Access Permissions

In Linux, objects such as files or folders or processes generally belong to the user who created or initiated them. There are some exceptions to this rule. For more information about the exceptions, refer to Глава 9, Списки управления доступом в Linux (Руководство по безопасности). The group which is associated with a file or a folder depends on the primary group the user belongs to when creating the object.

When you create a new file or directory, initial access permissions for this object are set according to a predefined scheme. As an owner of a file or directory, you can change the access permissions for this object. For example, you can protect files holding sensitive data against read access by other users and you can authorize the members of your group or other users to write, read, or execute several of your files where appropriate. As `root`, you can also change the ownership of files or folders.

### 17.5.1 Permissions for User, Group and Others

Three permission sets are defined for each file object on a Linux system. These sets include the read, write, and execute permissions for each of three types of users—the owner, the group, and other users.

The following example shows the output of an `ls -l` command in a shell. This command lists the contents of a directory and shows the details for each file and folder in that directory.

#### Пример 17.1 Access Permissions For Files and Folders

```
-rw-r----- 1 tux users      0 2006-06-23 16:08 checklist.txt
-rw-r--r-- 1 tux users 53279 2006-06-21 13:16 gnome_quick.xml
-rw-rw---- 1 tux users      0 2006-06-23 16:08 index.htm
-rw-r--r-- 1 tux users 70733 2006-06-21 09:35 kde-start.xml
-rw-r--r-- 1 tux users 47896 2006-06-21 09:46 kde_quick.xml
drwxr-xr-x 2 tux users    48 2006-06-23 16:09 local
-rwxr--r-- 1 tux users 624398 2006-06-23 15:43 tux.sh
```

As shown in the third column, all objects belong to user `tux`. They are assigned to the group `users` which is the primary group the user `tux` belongs to. To retrieve the access permissions the first column of the list must be examined more closely. Let's have a look at the file `kde-start.xml`:

Type	User Permissions	Group Permissions	Permissions for Others
-	rw-	r--	r--

The first column of the list consists of one leading character followed by nine characters grouped in three blocks. The leading character indicates the file type of the object: in this case, the hyphen (-) shows that `kde-start.xml` is a file. If you find the character `d` instead, this shows that the object is a directory, like `local` in [Пример 17.1, «Access Permissions For Files and Folders»](#) (стр. 198).

The next three blocks show the access permissions for the owner, the group and other users (from left to right). Each block follows the same pattern: the first position shows read permissions (r), the next position shows write permissions (w), the last one shows execute permission (x). A lack of either permission is indicated by -. In our example, the owner of `kde-start.xml` has read and write access to the file but cannot execute it. The `users` group can read the file but cannot write or execute it. The same holds true for the other users as shown in the third block of characters.

## 17.5.2 Files and Folders

Access permissions have a slightly different impact depending on the type of object they apply to: file or directory. The following table shows the details:

Таблица 17.1 Access Permissions For Files And Directories

Access Permission	File	Folder
Read (r)	Users can open and read the file.	Users can view the contents of the directory. Without this permission, users cannot list the contents of this directory with <code>ls -l</code> , for example. However, if they only have execute permission for the directory, they can nevertheless access certain files in this directory if they know of their existence.
Write (w)	Users can change the file: They can add or drop data and can even delete the contents of the file. However, this does not include the permission to remove the file completely from the directory as long as they do not have write permissions for the directory where the file is located.	Users can create, rename or delete files in the directory.
Execute (x)	Users can execute the file. This permission is only relevant for files	Users can change into the directory and execute files there. If

Access Permission	File	Folder
	like programs or shell scripts, not for text files. If the operating system can execute the file directly, users do not need read permission to execute the file. However, if the file must be interpreted like a shell script or a perl program, additional read permission is needed.	they do not have read access to that directory they cannot list the files but can access them nevertheless if they know of their existence.

Note that access to a certain file is always dependent on the correct combination of access permissions for the file itself and the directory it is located in.

### 17.5.3 Modifying File Permissions

In Linux, objects such as files or folder or processes generally belong to the user who created or initiated them. The group which is associated with a file or a folder depends on the primary group the user belongs to when creating the object. When you create a new file or directory, initial access permissions for this object are set according to a predefined scheme. For further details refer to [Раздел 17.5, «File Access Permissions»](#) (стр. 198).

As the owner of a file or directory (and, of course, as `root`), you can change the access permissions to this object.

To change object attributes like access permissions of a file or folder, use the `chmod` command followed by the following parameters:

- the users for which to change the permissions,
- the type of access permission you want to remove, set or add and
- the files or folders for which you want to change permissions separated by spaces.

The users for which you can change file access permissions fall into the following categories: the owner of the file (user, `u`), the group that own the file (group, `g`) and the other users (others, `o`). You can add, remove or set one or more of the following permissions: read, write or execute.

As `root`, you can also change the ownership of a file: with the command `chown` (change owner) you can transfer ownership to a new user.

#### 17.5.3.1 Examples for Changing Access Permissions and Ownership

The following example shows the output of an `ls -l` command in a shell.



## Пример 17.2 Access Permissions For Files and Folders

```
-rw-r----- 1 tux users      0 2006-06-23 16:08 checklist.txt
-rw-r--r-- 1 tux users 53279 2006-06-21 13:16 gnome_quick.xml
-rw-rw---- 1 tux users      0 2006-06-23 16:08 index.htm
-rw-r--r-- 1 tux users 70733 2006-06-21 09:35 kde-start.xml
-rw-r--r-- 1 tux users 47896 2006-06-21 09:46 kde_quick.xml
drwxr-xr-x 2 tux users      48 2006-06-23 16:09 local
-r-xr-xr-x 1 tux users 624398 2006-06-23 15:43 tux.jpg
```

In the example above, user `tux` owns the file `kde-start.xml` and has read and write access to the file but cannot execute it. The `users` group can read the file but cannot write or execute it. The same holds true for the other users as shown by the third block of characters.

## Процедура 17.4 Changing Access Permissions

Suppose you are `tux` and want to modify the access permissions to your files:

- 1 If you want to grant the `users` group also write access to `kde-start.xml`, enter

```
chmod g+w kde-start.xml
```

- 2 To grant the `users` group and other users write access to `kde-start.xml`, enter

```
chmod go+w kde-start.xml
```

- 3 To remove write access for all users, enter

```
chmod -w kde-start.xml
```

If you do not specify any kind of users, the changes apply to all users—the owner of the file, the owning group and the others. Now even the owner `tux` does not have write access to the file without first reestablishing write permissions.

- 4 To prohibit the `users` group and others to change into the directory `local`, enter

```
chmod go-x local
```

- 5 To grant others write permissions for two files, for `kde_quick.xml` and `gnome_quick.xml`, enter

```
chmod o+w kde_quick.xml gnome_quick.xml
```

## Процедура 17.5 Changing Ownership

Suppose you are `tux` and want to transfer the ownership of the file `kde_quick.xml` to an other user, named `wilber`. In this case, proceed as follows:

- 1 Enter the username and password for `root`.

## 2 Enter

```
chown wilber kde_quick.xml
```

## 3 Check what happened with

```
ls -l kde_quick.xml
```

You should get the following output:

```
-rw-r--r-- 1 wilber users 47896 2006-06-21 09:46
kde_quick.xml
```

- 4 If the ownership is set according to your wishes, switch back to your normal user account.

# 17.6 Useful Features of the Shell

As you probably noticed in the examples above, entering commands in Bash can include a lot of typing. In the following, get to know some features of the Bash that can make your work a lot easier and save a lot of typing.

## History

By default, Bash «remembers» commands you have entered. This feature is called history. You can browse through commands that have been entered before, select one you want to repeat and then execute it again. To do so, press `↑` repeatedly until the desired command appears at the prompt. To move forward through the list of previously entered commands, press `↓`. For easier repetition of a certain command from Bash history, just type the first letter of the command you want to repeat and press `↑`.

You can now edit the selected command (for example, change the name of a file or a path), before you execute the command by pressing `↑`. To edit the command line, just move the cursor to the desired position using the arrow keys and start typing.

You can also search for a certain command in the history. Press `↑` + `[R]` to start an incremental search function. showing the following prompt:

```
(reverse-i-search)`':
```

Just type one or several letters from the command you are searching for. Each character you enter narrows down the search. The corresponding search result is shown on the right side of the colon whereas your input appears on the left of the colon. To accept a search result, press `↑`. The prompt now changes to its normal appearance and shows the command you chose. You can now edit the command or directly execute it by pressing `↑`.

## Completion

Completing a filename or directory name to its full length after typing its first letters is another helpful feature of Bash. To do so, type the first letters then press `↑` (Tabulator). If the filename or path can be uniquely identified, it is completed at once and the cursor moves to the end of the filename. You can then enter the next option

of the command, if necessary. If the filename or path cannot be uniquely identified (because there are several filenames starting with the same letters), the filename or path is only completed up to the point where it becomes ambiguous again. You can then obtain a list of them by pressing `]` a second time. After this, you can enter the next letters of the file or path then try completion again by pressing `]`. When completing filenames and paths with the help of `]`, you can simultaneously check whether the file or path you want to enter really exists (and you can be sure of getting the spelling right).

### Wild Cards

You can replace one or more characters in a filename with a wild card for pathname expansion. Wild cards are characters that can stand for other characters. There are three different types of these in Bash:

Wild Card	Function
<code>?</code>	Matches exactly one arbitrary character
<code>*</code>	Matches any number of characters
<code>[set]</code>	Matches one of the characters from the group specified inside the square brackets, which is represented here by the string <i>set</i> .

## 17.6.1 Examples For Using History, Completion and Wildcards

The following examples illustrate how to make use of these convenient features of Bash.

### Процедура 17.6 Using History and Completion

If you already did the example [Раздел 17.3.1, «Examples for Working with Files and Directories»](#) (стр. 194) your shell buffer should be filled with commands which you can retrieve using the history function.

- 1 Press `]` repeatedly until `cd ~` appears.
- 2 Press `]` to execute the command and to switch to your home directory.

By default, your home directory contains two subdirectories starting with the same letter, `Documents` and `Desktop`.

- 3 Enter `cd D` and press `]`.

Nothing happens since Bash cannot identify to which one of the subdirectories you want to change.

- 4 Press `[]` again to see the list of possible choices:

```
tux@knox:~> cd D Desktop/ Documents/ tux@knox:~> cd D
```

- 5 The prompt still shows your initial input. Type the next character of the subdirectory you want to go to and press `[]` again.

Bash now completes the path.

- 6 You can now execute the command with `[]`.

## Процедура 17.7 Using Wildcards

Now suppose that your home directory contains a number of files with various file extensions. It also holds several versions of one file which you saved under different filenames `myfile1.txt`, `myfile2.txt` etc. You want to search for certain files according to their properties.

- 1 First, create some test files in your home directory:

- 1a Use the `touch` command to create several (empty) files with different file extensions, for example `.pdf`, `.xml` and `.jpg`.

You can do this consecutively (do not forget to use the Bash history function) or with only one `touch` command: simply add several filenames separated by a space.

- 1b Create at least two files that have the same file extension, for example `.html`.

- 1c To create several «versions» of one file, enter

```
touch myfile{1..5}.txt
```

This command creates five consecutively numbered files:

```
myfile1.txt,...,myfile5.txt
```

- 1d List the contents of your home directory. It should look similar to this:

```
-rw-r--r-- 1 tux users 0 2006-07-14 13:34
foo.xml
-rw-r--r-- 1 tux users 0 2006-07-14 13:47
home.html
-rw-r--r-- 1 tux users 0 2006-07-14 13:47
index.html
-rw-r--r-- 1 tux users 0 2006-07-14 13:47
toc.html
-rw-r--r-- 1 tux users 0 2006-07-14 13:34
manual.pdf
-rw-r--r-- 1 tux users 0 2006-07-14 13:49
myfile1.txt
```

```
-rw-r--r-- 1 tux users 0 2006-07-14 13:49  
myfile2.txt  
-rw-r--r-- 1 tux users 0 2006-07-14 13:49  
myfile3.txt  
-rw-r--r-- 1 tux users 0 2006-07-14 13:49  
myfile4.txt  
-rw-r--r-- 1 tux users 0 2006-07-14 13:49  
myfile5.txt  
-rw-r--r-- 1 tux users 0 2006-07-14 13:32  
tux.png
```

- 2 With the help of wild cards, select certain subsets of the files according to various criteria:

- 2a To list all files with the .html extension, enter

```
ls -l *.html
```

- 2b To list all «versions» of myfile.txt, enter

```
ls -l myfile?.txt
```

Note that you can only use the ? wild card here because the numbering of the files is single-digit. As soon as you have a file named myfile10.txt you must to use the \* wild card to view all versions of myfile.txt (or add another question mark, so your string looks like myfile???.txt).

- 2c To remove, for example, version 1-3 and version 5 of myfile.txt, enter

```
rm myfile[1-3,5].txt
```

- 2d Check the result with

```
ls -l
```

Of all myfile.txt versions only myfile4.txt should be left.

You can also combine several wild cards in one command. In the example above, `rm myfile[1-3,5].*` would lead to the same result as `rm myfile[1-3,5].txt` because there are only files with the extension .txt available.

---

#### ПРИМЕЧАНИЕ: Using Wildcards in rm Commands

Wildcards in a `rm` command can be very useful but also dangerous: you might delete more files from your directory than intended. To see which files would be affected by the `rm`, run your wildcard string with `ls` instead of `rm` first.

---

## 17.7 Editing Texts

In order to edit files from the command line, you will need to know the vi editor. vi is a default editor which can be found on nearly every UNIX/Linux system. It can run several operating modes in which the keys you press have different functions. This does not make it very easy for beginners, but you should know at least the most basic operations with vi. There may be situations where no other editor than vi is available.

Basically, vi makes use of three operating modes:

#### command mode

In this mode, vi accepts certain key combinations as commands. Simple tasks such as searching words or deleting a line can be executed.

#### insert mode

In this mode, you can write normal text.

#### extended mode

In this mode, also known as colon mode (as you have to enter a colon to switch to this mode), vi can execute also more complex tasks such as searching and replacing text.

In the following (very simple) example, you will learn how to open and edit a file with vi, how to save your changes and quit vi.

## 17.7.1 Example: Editing with vi

---

### ПРИМЕЧАНИЕ: Display of Keys

In the following, find several commands that you can enter in vi by just pressing keys. These appear in uppercase as on a keyboard. If you need to enter a key in uppercase, this is stated explicitly by showing a key combination including the `[ ]` key.

---

- 1 To create and open a new file with vi, enter

```
vi textfile.txt
```

By default, vi opens in command mode in which you cannot enter text.

- 2 Press `[I]` to switch to insert mode. The bottom line changes and indicates that you now can insert text.
- 3 Write some sentences. If you want to insert a new line, first press `[ ]` to switch back to command mode. Press `[O]` to insert a new line and to switch to insert mode again.
- 4 In the insert mode, you can edit the text with the arrow keys and with `[ ]`.
- 5 To leave vi, press `[ ]` to switch to command mode again. Then press `[:]` which takes you to the extended mode. The bottom line now shows a colon.

- 6 To leave vi and save your changes, type `wq` (w for write; q for quit) and press `[]`. If you want to save the file under a different name, type `w filename` and press `[]`.

To leave vi without saving, type `q!` instead and press `[]`.

## 17.8 Searching for Files or Contents

Bash offers you several commands to search for files and to search for the contents of files:

### `locate`

This utility is only available if you have installed the `findutils-locate` package. With this command you can find out in which directory a specified file is located. If desired, use wild cards to specify filenames. The program is very quick, because it uses a database specifically created for the purpose (rather than searching through the entire file system). This very fact, however, also results in a major drawback: `locate` is unable to find any files created after the latest update of its database. The database can be generated by `root` running `updatedb`.

### `find`

With `find`, search for a file in a given directory. The first argument specifies the directory in which to start the search. The option `-name` must be followed by a search string, which may also include wild cards. Unlike `locate`, which uses a database, `find` scans the actual directory.

### `grep`

The `grep` command finds a specific search string in the specified text files. If the search string is found, the command displays the line in which `searchstring` was found, along with the filename. If desired, use wild cards to specify filenames.

### 17.8.1 Examples for Searching

The KDE and GNOME desktops store user-specific application data in hidden directories, for example `.kde` and `.gnome`.

- 1 To locate these directories on your computer, enter

```
locate .kde
```

if you have installed KDE desktop or

```
locate .gnome
```

if you have installed GNOME desktop.

You will see that `locate` displays all file names in the database that contain the string `.kde` or `.gnome` anywhere. To learn how to modify this behavior refer to the man page of `locate`.

- 2 To search your home directory for all occurrences of filenames that contain the file extension `.txt`, use

```
find ~ -name '*.txt' -print
```

- 3 To search a directory (in this case, your home directory) for all occurrences of files which contain, for example, the word `music`, enter

```
grep music ~/*
```

Note that `grep` is case-sensitive— unless you use it with the `-i` option. With the command above you will not find any files containing `Music`.

If you want to use a search string which consists of more than one word, enclose the string in double quotation marks, for example:

```
grep "music is great" ~/*
```

## 17.9 Viewing Text Files

When searching for the contents of a file with `grep`, the output gives you the line in which the `searchstring` was found along with the filename. Often this contextual information is still not enough information to decide whether you want to open and edit this file. Bash offers you several commands to have a quick look at the contents of a text file directly in the shell, without opening an editor.

`head`

With `head` you can view the first lines of a text file. If you do not specify the command any further, `head` shows the first 10 lines of a text file.

`tail`

The `tail` command is the counterpart of `head`. If you use `tail` without any further options it displays the last 10 lines of a text file. This can be very useful to view log files of your system, where the most recent messages or log entries are usually found at the end of the file.

`less`

With `less`, display the whole contents of a text file. To move up and down half a page use `]` and `[`. Use `]` to scroll down one page. `]` takes you to the beginning, and `[` to the end of the document. To end the viewing mode, press `[Q]`.

`more`

Instead of `less`, you can also use the older program `more`. It has basically the same function—however, it is less convenient because it does not allow you to scroll backwards. Use `]` to move forward. When you reach the end of the document, the viewer closes automatically.

`cat`

The `cat` command displays the contents of a file, printing the entire contents to the screen without interruption. As `cat` does not allow you to scroll it is not very useful as viewer but it is rather often used in combination with other commands.



## 17.10 Redirection and Pipes

Sometimes it would be useful if you could write the output of a command to a file for further editing or if you could combine several commands, using the output of one command as the input for the next one. The shell offers this function by means of redirection or pipes.

Normally, the standard output in the shell is your screen (or an open shell window) and the standard input is the keyboard. With the help of certain symbols you can redirect the input or the output to another object, such as a file or another command.

### Redirection

With `>` you can forward the output of a command to a file (output redirection), with `<` you can use a file as input for a command (input redirection).

### Pipe

By means of a pipe symbol `|` you can also redirect the output: with a pipe, you can combine several commands, using the output of one command as input for the next command. In contrast to the other redirection symbols `>` and `<`, the use of the pipe is not constrained to files.

### 17.10.1 Examples for Redirection and Pipe

- 1 To write the output of a command like `ls` to a file, enter

```
ls -l > filelist.txt
```

This creates a file named `filelist.txt` that contains the list of contents of your current directory as generated by the `ls` command.

However, if a file named `filelist.txt` already exists, this command overwrites the existing file. To prevent this, use `>>` instead of `>`. Entering

```
ls -l >> filelist.txt
```

simply appends the output of the `ls` command to an already existing file named `filelist.txt`. If the file does not exist, it is created.

- 2 Redirections also works the other way round. Instead of using the standard input from the keyboard for a command, you can use a file as input:

```
sort < filelist.txt
```

This will force the `sort` command to get its input from the contents of `filelist.txt`. The result is shown on the screen. Of course, you can also write the result into another file, using a combination of redirections:

```
sort < filelist.txt > sorted_filelist.txt
```

- 3 If a command generates a lengthy output, like `ls -l` may do, it may be useful to pipe the output to a viewer like `less` to be able to scroll through the pages. To do so, enter

```
ls -l | less
```

The list of contents of the current directory is shown in `less`.

The pipe is also often used in combination with the `grep` command in order to search for a certain string in the output of another command. For example, if you want to view a list of files in a directory which are owned by the user `tux`, enter

```
ls -l | grep tux
```

## 17.11 Starting Programs and Handling Processes

As you have seen in [Раздел 17.7, «Editing Texts»](#) (стр. 205), programs can be started from the shell. Applications with a graphical user interface need the X Window System and can only be started from a terminal window within a graphical user interface. For example, if you want to open a file named `vacation.pdf` in your home directory from a terminal window in KDE or GNOME, simply run `okular ~/vacation.pdf` (or `evince ~/vacation.pdf`) to start a PDF viewer displaying your file.

When looking at the terminal window again you will realize that the command line is blocked as long as the PDF viewer is open, meaning that your prompt is not available. To change this, press `[ + [Z]` to suspend the process and enter `bg` to send the process to the background. Now you can still have a look at `vacation.pdf` while your prompt is available for further commands. An easier way to achieve this is by sending a process to the background directly when starting it. To do so, add an ampersand at the end of the command:

```
okular ~/vacation.pdf &
```

If you have started several background processes (also named jobs) from the same shell, the `jobs` command gives you an overview of the jobs. It also shows the job number in brackets and their status:

```
tux@linux:~> jobs
[1]  Running          okular book.opensuse.startup-xep.pdf &
[2]-  Running          okular book.opensuse.reference-xep.pdf &
[3]+  Stopped         man jobs
```

To bring a job to the foreground again, enter `fg job_number`.

Whereas `job` only shows the background processes started from a specific shell, the `ps` command (run without options) shows a list of all your processes—those you started. Find an example output below:

```
tux@linux:~> ps
PID TTY          TIME CMD
15500 pts/1        00:00:00 bash
28214 pts/1        00:00:00 okular
30187 pts/1        00:00:00 kwrite
```

```
30280 pts/1    00:00:00 ps
```

In case a program cannot be terminated in the normal way, use the `kill` command to stop the process (or processes) belonging to that program. To do so, specify the process ID (PID) shown by the output of `ps`. For example, to shut down the KWrite editor in the example above, enter

```
kill 30187
```

This sends a `TERM` signal that instructs the program to shut itself down.

Alternatively, if the program or process you want to terminate is a background job and is shown by the `jobs` command, you can also use the `kill` command in combination with the job number to terminate this process. When identifying the job with the job number, you must prefix the number with a percent character (%):

```
kill %job_number
```

If `kill` does not help—as is sometimes the case for «runaway» programs—try

```
kill -9 PID
```

This sends a `KILL` signal instead of a `TERM` signal, bringing the specified process to an end in most cases.

This section is intended to introduce the most basic set of commands for handling jobs and processes. Find an overview for system administrators in Section “Processes” (Chapter 2, System Monitoring Utilities, ↑System Analysis and Tuning Guide).

## 17.12 Important Linux Commands

This section gives insight into the most important commands. There are many more commands than listed in this chapter. Along with the individual commands, parameters are listed and, where appropriate, a typical sample application is introduced. To learn more about the various commands, use the manual pages, accessed with `man` followed by the name of the command, for example, `man ls`.

Man pages are displayed directly in the shell. To navigate them, move up and down with `↑` and `↓`. Move between the beginning and the end of a document with `⏪` and `⏩`. End this viewing mode by pressing `[Q]`. Learn more about the `man` command itself with `man man`.

In the following overview, the individual command elements are written in different typefaces. The actual command and its mandatory options are always printed as `command option`. Specifications or parameters that are not required are placed in `[square brackets]`.

Adjust the settings to your needs. It makes no sense to write `ls file` if no file named `file` actually exists. You can usually combine several parameters, for example, by writing `ls -la` instead of `ls -l -a`.

## 17.12.1 File Commands

The following section lists the most important commands for file management. It covers everything from general file administration to the manipulation of file system ACLs.

### 17.12.1.1 File Administration

`ls [options] [files]`

If you run `ls` without any additional parameters, the program lists the contents of the current directory in short form.

`-l`  
Detailed list

`-a`  
Displays hidden files

`cp [options] source target`  
Copies `source` to `target`.

`-i`  
Waits for confirmation, if necessary, before an existing `target` is overwritten

`-r`  
Copies recursively (includes subdirectories)

`mv [options] source target`  
Copies `source` to `target` then deletes the original `source`.

`-b`  
Creates a backup copy of the `source` before moving

`-i`  
Waits for confirmation, if necessary, before an existing `targetfile` is overwritten

`rm [options] files`  
Removes the specified files from the file system. Directories are not removed by `rm` unless the option `-r` is used.

`-r`  
Deletes any existing subdirectories

`-i`  
Waits for confirmation before deleting each file

`ln [options] source target`  
Creates an internal link from `source` to `target`. Normally, such a link points directly to `source` on the same file system. However, if `ln` is executed with the `-s` option, it creates a symbolic link that only points to the directory in which `source` is located, enabling linking across file systems.

-s

Creates a symbolic link

`cd [options] [directory]`

Changes the current directory. `cd` without any parameters changes to the user's home directory.

`mkdir [options] directory`

Creates a new directory.

`rmdir [options] directory`

Deletes the specified directory if it is already empty.

`chown [options] username[:[group]] files`

Transfers ownership of a file to the user with the specified username.

-R

Changes files and directories in all subdirectories

`chgrp [options] groupname files`

Transfers the group ownership of a given `file` to the group with the specified group name. The file owner can change group ownership only if a member of both the current and the new group.

`chmod [options] mode files`

Changes the access permissions.

The `mode` parameter has three parts: `group`, `access`, and `access type`. `group` accepts the following characters:

u

User

g

Group

o

Others

For `access`, grant access with `+` and deny it with `-`.

The `access type` is controlled by the following options:

r

Read

w

Write

x

Execute—executing files or changing to the directory

S

Setuid bit—the application or program is started as if it were started by the owner of the file

As an alternative, a numeric code can be used. The four digits of this code are composed of the sum of the values 4, 2, and 1—the decimal result of a binary mask. The first digit sets the set user ID (SUID) (4), the set group ID (2), and the sticky (1) bits. The second digit defines the permissions of the owner of the file. The third digit defines the permissions of the group members and the last digit sets the permissions for all other users. The read permission is set with 4, the write permission with 2, and the permission for executing a file is set with 1. The owner of a file would usually receive a 6 or a 7 for executable files.

`gzip [parameters] files`

This program compresses the contents of files using complex mathematical algorithms. Files compressed in this way are given the extension `.gz` and need to be uncompressed before they can be used. To compress several files or even entire directories, use the `tar` command.

-d

Decompresses the packed gzip files so they return to their original size and can be processed normally (like the command `gunzip`)

`tar options archive files`

`tar` puts one or more files into an archive. Compression is optional. `tar` is a quite complex command with a number of options available. The most frequently used options are:

-f

Writes the output to a file and not to the screen as is usually the case

-c

Creates a new tar archive

-r

Adds files to an existing archive

-t

Outputs the contents of an archive

-u

Adds files, but only if they are newer than the files already contained in the archive

-x

Unpacks files from an archive (extraction)

-z

Packs the resulting archive with `gzip`

-j

Compresses the resulting archive with `bzip2`

-v

Lists files processed

The archive files created by `tar` end with `.tar`. If the tar archive was also compressed using `gzip`, the ending is `.tgz` or `.tar.gz`. If it was compressed using `bzip2`, the ending is `.tar.bz2`.

`locate patterns`

This command is only available if you have installed the `findutils-locate` package. The `locate` command can find in which directory a specified file is located. If desired, use wild cards to specify filenames. The program is very fast, because it uses a database specifically created for the purpose (rather than searching through the entire file system). This very fact, however, also results in a major drawback: `locate` is unable to find any files created after the latest update of its database. The database can be generated by `root` with `updatedb`.

`updatedb [options]`

This command performs an update of the database used by `locate`. To include files in all existing directories, run the program as `root`. It also makes sense to place it in the background by appending an ampersand (&), so you can immediately continue working on the same command line (`updatedb &`). This command usually runs as a daily cron job (see `cron.daily`).

`find [options]`

With `find`, search for a file in a given directory. The first argument specifies the directory in which to start the search. The option `-name` must be followed by a search string, which may also include wild cards. Unlike `locate`, which uses a database, `find` scans the actual directory.

### 17.12.1.2 Commands to Access File Contents

`file [options] [files]`

With `file`, detect the contents of the specified files.

-Z

Tries to look inside compressed files

`cat [options] files`

The `cat` command displays the contents of a file, printing the entire contents to the screen without interruption.

-n

Numbers the output on the left margin

`less [options] files`

This command can be used to browse the contents of the specified file. Scroll half a screen page up or down with `[PgUp]` and `[PgDn]` or a full screen page down with `[Space]`. Jump to the beginning or end of a file using `[Home]` and `[End]`. Press `[Q]` to exit the program.

`grep [options] searchstring files`

The `grep` command finds a specific search string in the specified files. If the search string is found, the command displays the line in which `searchstring` was found along with the filename.

`-i`

Ignores case

`-H`

Only displays the names of the relevant files, but not the text lines

`-n`

Additionally displays the numbers of the lines in which it found a hit

`-l`

Only lists the files in which `searchstring` does not occur

`diff [options] file1 file2`

The `diff` command compares the contents of any two files. The output produced by the program lists all lines that do not match. This is frequently used by programmers who need only to send their program alterations and not the entire source code.

`-q`

Only reports whether the two files differ

`-u`

Produces a «unified» diff, which makes the output more readable

### 17.12.1.3 File Systems

`mount [options] [device] mountpoint`

This command can be used to mount any data media, such as hard disks, CD-ROM drives, and other drives, to a directory of the Linux file system.

`-r`

Mount read-only

`-t filesystem`

Specify the file system, commonly `ext2` for Linux hard disks, `msdos` for MS-DOS media, `vfat` for the Windows file system, and `iso9660` for CDs

For hard disks not defined in the file `/etc/fstab`, the device type must also be specified. In this case, only `root` can mount it. If the file system needs to also be mounted by other users, enter the option `user` in the appropriate line in the `/etc/fstab` file (separated by commas) and save this change. Further information is available in the `mount(1)` man page.

`umount [options] mountpoint`

This command unmounts a mounted drive from the file system. To prevent data loss, run this command before taking a removable data medium from its drive.



Normally, only `root` is allowed to run the commands `mount` and `umount`. To enable other users to run these commands, edit the `/etc/fstab` file to specify the option `user` for the relevant drive.

## 17.12.2 System Commands

The following section lists a few of the most important commands needed for retrieving system information and controlling processes and the network.

### 17.12.2.1 System Information

`df [options] [directory]`

The `df` (disk free) command, when used without any options, displays information about the total disk space, the disk space currently in use, and the free space on all the mounted drives. If a directory is specified, the information is limited to the drive on which that directory is located.

`-h`  
Shows the number of occupied blocks in gigabytes, megabytes, or kilobytes—in human-readable format

`-T`  
Type of file system (ext2, nfs, etc.)

`du [options] [path]`

This command, when executed without any parameters, shows the total disk space occupied by files and subdirectories in the current directory.

`-a`  
Displays the size of each individual file

`-h`  
Output in human-readable form

`-s`  
Displays only the calculated total size

`free [options]`

The command `free` displays information about RAM and swap space usage, showing the total and the used amount in both categories. See Раздел “The free Command” (Глава 7, Special System Features, Содержание) for more information.

`-b`  
Output in bytes

`-k`  
Output in kilobytes

`-m`  
Output in megabytes

`date [options]`

This simple program displays the current system time. If run as `root`, it can also be used to change the system time. Details about the program are available in the `date(1)` man page.

### 17.12.2.2 Processes

`top [options]`

`top` provides a quick overview of the currently running processes. Press `[H]` to access a page that briefly explains the main options for customizing the program.

`ps [options] [process_ID]`

If run without any options, this command displays a table of all your own programs or processes—those you started. The options for this command are not preceded by hyphen.

`aux`

Displays a detailed list of all processes, independent of the owner

`kill [options] process_ID`

Unfortunately, sometimes a program cannot be terminated in the normal way. In most cases, you should still be able to stop such a runaway program by executing the `kill` command, specifying the respective process ID (see `top` and `ps`). `kill` sends a `TERM` signal that instructs the program to shut itself down. If this does not help, the following parameter can be used:

`-9`

Sends a `KILL` signal instead of a `TERM` signal, bringing the specified process to an end in almost all cases

`killall [options] processname`

This command is similar to `kill`, but uses the process name (instead of the process ID) as an argument, killing all processes with that name.

### 17.12.2.3 Network

`ping [options] hostname_or_IP address`

The `ping` command is the standard tool for testing the basic functionality of TCP/IP networks. It sends a small data packet to the destination host, requesting an immediate reply. If this works, `ping` displays a message to that effect, which indicates that the network link is basically functioning.

`-c number`

Determines the total number of packages to send and ends after they have been dispatched (by default, there is no limitation set)

`-f`

flood ping: sends as many data packages as possible; a popular means, reserved for `root`, to test networks

`-i value`

Specifies the interval between two data packages in seconds (default: one second)

`host [options] hostname [server]`

The domain name system resolves domain names to IP addresses. With this tool, send queries to name servers (DNS servers).

`ssh [options] [user@]hostname [command]`

SSH is actually an Internet protocol that enables you to work on remote hosts across a network. SSH is also the name of a Linux program that uses this protocol to enable operations on remote computers.

### 17.12.2.4 Miscellaneous

`passwd [options] [username]`

Users may change their own passwords at any time using this command. The administrator `root` can use the command to change the password of any user on the system.

`su [options] [username]`

The `su` command makes it possible to log in under a different username from a running session. Specify a username and the corresponding password. The password is not required from `root`, because `root` is authorized to assume the identity of any user. When using the command without specifying a username, you are prompted for the `root` password and change to the superuser (`root`). Use `su` – to start a login shell for a different user.

`halt [options]`

To avoid loss of data, you should always use this program to shut down your system.

`reboot [options]`

Does the same as `halt` except the system performs an immediate reboot.

`clear`

This command cleans up the visible area of the console. It has no options.

### 17.12.3 For More Information

There are many more commands than listed in this chapter. For information about other commands or more detailed information, the O'Reilly publication *Linux in a Nutshell* is recommended.



## 18 Bash and Bash Scripts

These days many people use computers with a graphical user interface (GUI) like KDE or GNOME. Although they offer lots of features, their use is limited when it comes to the execution of automatical tasks. Shells are a good addition to GUIs and this chapter gives you an overview of some aspects of shells, in this case Bash.

### 18.1 What is «The Shell»?

Traditionally, the shell is Bash (Bourne again Shell). When this chapter speaks about «the shell» it means Bash. There are actually more available shells than Bash (ash, csh, ksh, zsh, ...), each employing different features and characteristics. If you need further information about other shells, search for shell in YaST.

#### 18.1.1 Knowing The Bash Configuration Files

A shell can be invoked as an:

1. interactive login shell. This is used when logging in to a machine, invoking Bash with the `--login` option or when logging in to a remote machine with SSH.
2. «ordinary» interactive shell. This is normally the case when starting xterm, konsole, gnome-terminal or similar tools.
3. non-interactive shell. This is used when invoking a shell script at the commandline.

Depending on which type of shell you use, different configuration files are being read. The following tables show the login and non-login shell configuration files.

Таблица 18.1 Bash Configuration Files for Login Shells

File	Description
<code>/etc/profile</code>	Do not modify this file, otherwise your modifications can be destroyed during your next update!
<code>/etc/profile.local</code>	Use this file if you extend <code>/etc/profile</code>
<code>/etc/profile.d/</code>	Contains system-wide configuration files for specific programs
<code>~/.profile</code>	Insert user specific configuration for login shells here

Таблица 18.2 Bash Configuration Files for Non-Login Shells

<code>/etc/bash.bashrc</code>	Do not modify this file, otherwise your modifications can be destroyed during your next update!
<code>/etc/bash.bashrc.local</code>	Use this file to insert your system-wide modifications for Bash only
<code>~/.bashrc</code>	Insert user specific configuration here

Additionally, Bash uses some more files:

Таблица 18.3 Special Files for Bash

File	Description
<code>~/.bash_history</code>	Contains a list of all commands you have been typing
<code>~/.bash_logout</code>	Executed when logging out

## 18.1.2 The Directory Structure

The following table provides a short overview of the most important higher-level directories that you find on a Linux system. Find more detailed information about the directories and important subdirectories in the following list.

Таблица 18.4 Overview of a Standard Directory Tree

Directory	Contents
<code>/</code>	Root directory—the starting point of the directory tree.
<code>/bin</code>	Essential binary files, such as commands that are needed by both the system administrator and normal users. Usually also contains the shells, such as Bash.
<code>/boot</code>	Static files of the boot loader.
<code>/dev</code>	Files needed to access host-specific devices.

Directory	Contents
<code>/etc</code>	Host-specific system configuration files.
<code>/home</code>	Holds the home directories of all users who have accounts on the system. However, <code>root</code> 's home directory is not located in <code>/home</code> but in <code>/root</code> .
<code>/lib</code>	Essential shared libraries and kernel modules.
<code>/media</code>	Mount points for removable media.
<code>/mnt</code>	Mount point for temporarily mounting a file system.
<code>/opt</code>	Add-on application software packages.
<code>/root</code>	Home directory for the superuser <code>root</code> .
<code>/sbin</code>	Essential system binaries.
<code>/srv</code>	Data for services provided by the system.
<code>/tmp</code>	Temporary files.
<code>/usr</code>	Secondary hierarchy with read-only data.
<code>/var</code>	Variable data such as log files.
<code>/windows</code>	Only available if you have both Microsoft Windows* and Linux installed on your system. Contains the Windows data.

The following list provides more detailed information and gives some examples of which files and subdirectories can be found in the directories:

`/bin`

Contains the basic shell commands that may be used both by `root` and by other users. These commands include `ls`, `mkdir`, `cp`, `mv`, `rm` and `rmdir`. `/bin` also contains Bash, the default shell in .

`/boot`

Contains data required for booting, such as the boot loader, the kernel, and other data that is used before the kernel begins executing user-mode programs.

`/dev`

Holds device files that represent hardware components.

`/etc`

Contains local configuration files that control the operation of programs like the X Window System. The `/etc/init.d` subdirectory contains scripts that are executed during the boot process.

`/home/username`

Holds the private data of every user who has an account on the system. The files located here can only be modified by their owner or by the system administrator. By default, your e-mail directory and personal desktop configuration are located here in the form of hidden files and directories. KDE users find the personal configuration data for their desktop in `.kde4` and GNOME users find it in `.gconf`.

---

**ПРИМЕЧАНИЕ:** Home Directory in a Network Environment

If you are working in a network environment, your home directory may be mapped to a directory in the file system other than `/home`.

---

`/lib`

Contains the essential shared libraries needed to boot the system and to run the commands in the root file system. The Windows equivalent for shared libraries are DLL files.

`/media`

Contains mount points for removable media, such as CD-ROMs, USB sticks and digital cameras (if they use USB). `/media` generally holds any type of drive except the hard drive of your system. As soon as your removable medium has been inserted or connected to the system and has been mounted, you can access it from here.

`/mnt`

This directory provides a mount point for a temporarily mounted file system. `root` may mount file systems here.

`/opt`

Reserved for the installation of third-party software. Optional software and larger add-on program packages can be found here.

`/root`

Home directory for the `root` user. The personal data of `root` is located here.



`/sbin`

As the `s` indicates, this directory holds utilities for the superuser. `/sbin` contains the binaries essential for booting, restoring and recovering the system in addition to the binaries in `/bin`.

`/srv`

Holds data for services provided by the system, such as FTP and HTTP.

`/tmp`

This directory is used by programs that require temporary storage of files.

---

#### BAKH0: Cleaning up `/tmp` at Boot Time

Data stored in `/tmp` are not guaranteed to survive a system reboot. It depends, for example, on settings in `/etc/sysconfig/cron`.

---

`/usr`

`/usr` has nothing to do with users, but is the acronym for UNIX system resources. The data in `/usr` is static, read-only data that can be shared among various hosts compliant with the Filesystem Hierarchy Standard (FHS). This directory contains all application programs and establishes a secondary hierarchy in the file system. KDE4 and GNOME are also located here. `/usr` holds a number of subdirectories, such as `/usr/bin`, `/usr/sbin`, `/usr/local`, and `/usr/share/doc`.

`/usr/bin`

Contains generally accessible programs.

`/usr/sbin`

Contains programs reserved for the system administrator, such as repair functions.

`/usr/local`

In this directory the system administrator can install local, distribution-independent extensions.

`/usr/share/doc`

Holds various documentation files and the release notes for your system. In the `manual` subdirectory find an online version of this manual. If more than one language is installed, this directory may contain versions of the manuals for different languages.

Under `packages` find the documentation included in the software packages installed on your system. For every package, a subdirectory `/usr/share/doc/packages/packagename` is created that often holds README files for the package and sometimes examples, configuration files or additional scripts.

If HOWTOs are installed on your system `/usr/share/doc` also holds the `howto` subdirectory in which to find additional documentation on many tasks related to the setup and operation of Linux software.

/var

Whereas /usr holds static, read-only data, /var is for data which is written during system operation and thus is variable data, such as log files or spooling data. For an overview of the most important log files you can find under /var/log/, refer to [Таблица A.2, «Log Files»](#) (стр. 238).

/windows

Only available if you have both Microsoft Windows and Linux installed on your system. Contains the Windows data available on the Windows partition of your system. Whether you can edit the data in this directory depends on the file system your Windows partition uses. If it is FAT32, you can open and edit the files in this directory. For NTFS, also includes write access support. However, the driver for the NTFS-3g file system has limited functionality. Learn more in Раздел "Accessing Files on Different OS on the Same Computer" (Глава 23, Copying and Sharing Files, ↑Содержание).

## 18.2 Writing Shell Scripts

Shell scripts are a convenient way of doing all sorts of tasks: collecting data, searching for a word or phrase in a text and many other useful things. The following example shows a small shell script that prints a text:

### Пример 18.1 A Shell Script Printing a Text

```
#!/bin/sh ❶
# Output the following line: ❷
echo "Hello World" ❸
```

- ❶ The first line begins with the Shebang characters (#!) which is an indicator that this file is a script. The script is executed with the specified interpreter after the Shebang, in this case /bin/sh.
- ❷ The second line is a comment beginning with the hash sign. It is recommended to comment difficult lines to remember what they do.
- ❸ The third line uses the built-in command `echo` to print the corresponding text.

Before you can run this script you need some prerequisites:

1. Every script should contain a Shebang line (this is already the case with our example above.) If a script does not have this line, you have to call the interpreter manually.
2. You can save the script wherever you want. However, it is a good idea to save it in a directory where the shell can find it. The search path in a shell is determined by the environment variable `PATH`. Usually a normal user does not have write access to /usr/bin. Therefore it is recommended to save your scripts in the users' directory ~/bin/. The above example gets the name `hello.sh`.
3. The script needs executable permissions. Set the permissions with the following command:

```
chmod +x ~/bin/hello.sh
```

If you have fulfilled all of the above prerequisites, you can execute the script in the following ways:

1. **Absolute Path** The script can be executed with an absolute path. In our case, it is `~/bin/hello.sh`.
2. **Everywhere** If the `PATH` environment variable contains the directory where the script is located, you can execute the script just with `hello.sh`.

## 18.3 Redirecting Command Events

Each command can use three channels, either for input or output:

- **Standard Output** This is the default output channel. Whenever a command prints something, it uses the standard output channel.
- **Standard Input** If a command needs input from users or other commands, it uses this channel.
- **Standard Error** Commands use this channel for error reporting.

To redirect these channels, there are the following possibilities:

Command > File

Saves the output of the command into a file, an existing file will be deleted. For example, the `ls` command writes its output into the file `listing.txt`:

```
ls > listing.txt
```

Command >> File

Appends the output of the command to a file. For example, the `ls` command appends its output to the file `listing.txt`:

```
ls >> listing.txt
```

Command < File

Reads the file as input for the given command. For example, the `read` command reads in the content of the file into the variable:

```
read a < foo
```

Command1 | Command2

Redirects the output of the left command as input for the right command. For example, the `cat` command outputs the content of the `/proc/cpuinfo` file. This output is used by `grep` to filter only those lines which contain `cpu`:

```
cat /proc/cpuinfo | grep cpu
```

Every channel has a file descriptor: 0 (zero) for standard input, 1 for standard output and 2 for standard error. It is allowed to insert this file descriptor before a `<` or `>`

character. For example, the following line searches for a file starting with `foo`, but suppresses its errors by redirecting it to `/dev/null`:

```
find / -name "foo*" 2>/dev/null
```

## 18.4 Using Aliases

An alias is a shortcut definition of one or more commands. The syntax for an alias is:

```
alias NAME=DEFINITION
```

For example, the following line defines an alias `lt` which outputs a long listing (option `-l`), sorts it by modification time (`-t`) and prints it in reverse order while sorting (`-r`):

```
alias lt='ls -ltr'
```

To view all alias definitions, use `alias`. Remove your alias with `unalias` and the corresponding alias name.

## 18.5 Using Variables in Bash

A shell variable can be global or local. Global variables, or environment variables, can be accessed in all shells. In contrast, local variables are visible in the current shell only.

To view all environment variables, use the `printenv` command. If you need to know the value of a variable, insert the name of your variable as an argument:

```
printenv PATH
```

A variable, be it global or local, can also be viewed with `echo`:

```
echo $PATH
```

To set a local variable, use a variable name followed by the equal sign, followed by the value:

```
PROJECT="SLED"
```

Do not insert spaces around the equal sign, otherwise you get an error. To set an environment variable, use `export`:

```
export NAME="tux"
```

To remove a variable, use `unset`:

```
unset NAME
```

The following table contains some common environment variables which can be used in you shell scripts:

Таблица 18.5 Useful Environment Variables

HOME	the home directory of the current user
------	--

HOST	the current host name
LANG	when a tool is localized, it uses the language from this environment variable. English can also be set to <code>C</code>
PATH	the search path of the shell, a list of directories separated by colon
PS1	specifies the normal prompt printed before each command
PS2	specifies the secondary prompt printed when you execute a multi-line command
PWD	current working directory
USER	the current user

## 18.5.1 Using Argument Variables

For example, if you have the script `foo.sh` you can execute it like this:

```
foo.sh "Tux Penguin" 2000
```

To access all the arguments which are passed to your script, you need positional parameters. These are `$1` for the first argument, `$2` for the second, and so on. You can have up to nine parameters. To get the script name, use `$0`.

The following script `foo.sh` prints all arguments from 1 to 4:

```
#!/bin/sh
echo \"$1\" \"$2\" \"$3\" \"$4\"
```

If you execute this script with the above arguments, you get:

```
"Tux Penguin" "2000" "" ""
```

## 18.5.2 Using Variable Substitution

Variable substitutions apply a pattern to the content of a variable either from the left or right side. The following list contains the possible syntax forms:

```
${VAR#pattern}
```

removes the shortest possible match from the left:

```
file=/home/tux/book/book.tar.bz2
echo ${file##*/}
home/tux/book/book.tar.bz2
```

`${VAR##pattern}`  
removes the longest possible match from the left:

```
file=/home/tux/book/book.tar.bz2
echo ${file##*/}
book.tar.bz2
```

`${VAR%pattern}`  
removes the shortest possible match from the right:

```
file=/home/tux/book/book.tar.bz2
echo ${file%.*}
/home/tux/book/book.tar
```

`${VAR%%pattern}`  
removes the longest possible match from the right:

```
file=/home/tux/book/book.tar.bz2
echo ${file%%.*}
/home/tux/book/book
```

`${VAR/pattern_1/pattern_2}`  
substitutes the content of *VAR* from the *pattern\_1* with *pattern\_2*:

```
file=/home/tux/book/book.tar.bz2
echo ${file/tux/wilber}
/home/wilber/book/book.tar.bz2
```

## 18.6 Grouping And Combining Commands

Shells allow you to concatenate and group commands for conditional execution. Each command returns an exit code which determines the success or failure of its operation. If it is 0 (zero) the command was successful, everything else marks an error which is specific to the command.

The following list shows, how commands can be grouped:

`Command1 ; Command2`  
executes the commands in sequential order. The exit code is not checked. The following line displays the content of the file with `cat` and then prints its file properties with `ls` regardless of their exit codes:

```
cat filelist.txt ; ls -l filelist.txt
```

`Command1 && Command2`  
runs the right command, if the left command was successful (logical AND). The following line displays the content of the file and prints its file properties only, when

the previous command was successful (compare it with the previous entry in this list):

```
cat filelist.txt && ls -l filelist.txt
```

`Command1 || Command2`

runs the right command, when the left command has failed (logical OR). The following line creates only a directory in `/home/wilber/bar` when the creation of the directory in `/home/tux/foo` has failed:

```
mkdir /home/tux/foo || mkdir /home/wilber/bar
```

`funcname(){ ... }`

creates a shell function. You can use the positional parameters to access its arguments. The following line defines the function `hello` to print a short message:

```
hello() { echo "Hello $1"; }
```

You can call this function like this:

```
hello Tux
```

which prints:

```
Hello Tux
```

## 18.7 Working with Common Flow Constructs

To control the flow of your script, a shell has `while`, `if`, `for` and `case` constructs.

### 18.7.1 The if Control Command

The `if` command is used to check expressions. For example, the following code tests whether the current user is Tux:

```
if test $USER = "tux"; then
    echo "Hello Tux."
else
    echo "You are not Tux."
fi
```

The test expression can be as complex or simple as possible. The following expression checks if the file `foo.txt` exists:

```
if test -e /tmp/foo.txt ; then
    echo "Found foo.txt"
fi
```

The test expression can also be abbreviated in angled brackets:

```
if [ -e /tmp/foo.txt ] ; then
    echo "Found foo.txt"
```

```
fi
```

Find more useful expressions at <http://www.cyberciti.biz/nixcraft/linux/docs/uniqlinuxfeatures/lstt/ch03sec02.html>.

## 18.7.2 Creating Loops With the For Command

The `for` loop allows you to execute commands to a list of entries. For example, the following code prints some information about PNG files in the current directory:

```
for i in *.png;
do
    ls -l $i
done
```

## 18.8 For More Information

Important information about Bash is provided in the man pages `man bash`. More about this topic can be found in the following list:

- <http://tldp.org/LDP/Bash-Beginners-Guide/html/index.html>—Bash Guide for Beginners
- <http://tldp.org/HOWTO/Bash-Prog-Intro-HOWTO.html>—BASH Programming - Introduction HOW-TO
- <http://tldp.org/LDP/abs/html/index.html>—Advanced Bash-Scripting Guide
- <http://www.grymoire.com/Unix/Sh.html>—Sh - the Bourne Shell



## A.1 Help and Documentation

comes with various sources of information and documentation, many of which are already integrated into your installed system.

### Documentation in `/usr/share/doc`

This traditional help directory holds various documentation files and release notes for your system. It contains also information of installed packages in the subdirectory `packages`. Find more detailed information in [Раздел A.1.1, «Documentation Directory»](#) (стр. 233).

### Man Pages and Info Pages for Shell Commands

When working with the shell, you do not need to know the options of the commands by heart. Traditionally, the shell provides integrated help by means of man pages and info pages. Read more in [Раздел A.1.2, «Man Pages»](#) (стр. 235) and [Раздел A.1.3, «Info Pages»](#) (стр. 236).

### Desktop Help Centers

The help centers of both the KDE desktop (Центр справки KDE) and the GNOME desktop (Help) provide central access to the most important documentation resources on your system in searchable form. These resources include online help for installed applications, man pages, info pages, and the Novell/SUSE manuals delivered with your product.

### Separate Help Packages for Some Applications

When installing new software with YaST, the software documentation is installed automatically (in most cases) and usually appears in the help center of your desktop. However, some applications, such as GIMP, may have different online help packages that can be installed separately with YaST and do not integrate into the help centers.

## A.1.1 Documentation Directory

The traditional directory to find documentation on your installed Linux system is `/usr/share/doc`. Usually, the directory contains information about the packages installed on your system, plus release notes, manuals, and more.

---

**ПРИМЕЧАНИЕ:** Contents Depends on Installed Packages

In the Linux world, many manuals and other kinds of documentation are available in the form of packages, just like software. How much and which information you find in `/usr/share/docs` also depends on the (documentation) packages installed. If

you cannot find the subdirectories mentioned here, check if the respective packages are installed on your system and add them with YaST, if needed.

---

### A.1.1.1 Novell/SUSE Manuals

We provide HTML and PDF versions of our books in different languages. In the `manual` subdirectory, find HTML versions of most of the Novell/SUSE manuals available for your product. For an overview of all documentation available for your product refer to the preface of the manuals.

If more than one language is installed, `/usr/share/doc/manual` may contain different language versions of the manuals. The HTML versions of the Novell/SUSE manuals are also available in the help center of both desktops. For information on where to find the PDF and HTML versions of the books on your installation media, refer to the Release Notes. They are available on your installed system under `/usr/share/doc/release-notes/` or online at your product-specific Web page at <http://www.suse.com/documentation/>.

### A.1.1.2 HOWTOs

If the `howto` package is installed on your system, `/usr/share/doc` also holds the `howto` subdirectory, where you find additional documentation for many tasks relating to the setup and operation of Linux software.

### A.1.1.3 Package Documentation

Under `packages`, find the documentation that is included in the software packages installed on your system. For every package, a subdirectory `/usr/share/doc/packages/packagename` is created. It often contains README files for the package and sometimes examples, configuration files, or additional scripts. The following list introduces typical files to be found under `/usr/share/doc/packages`. None of these entries are mandatory and many packages might just include a few of them.

#### AUTHORS

List of the main developers.

#### BUGS

Known bugs or malfunctions. Might also contain a link to a Bugzilla Web page where you can search all bugs.

#### CHANGES , ChangeLog

Summary of changes from version to version. Usually interesting for developers, because it is very detailed.

#### COPYING , LICENSE

Licensing information.

#### FAQ

Question and answers collected from mailing lists or newsgroups.

## INSTALL

How to install this package on your system. As the package is already installed by the time you get to read this file, you can safely ignore the contents of this file.

## README, README.\*

General information on the software. For example, for what purpose and how to use it.

## TODO

Things that are not implemented yet, but probably will be in the future.

## MANIFEST

List of files with a brief summary.

## NEWS

Description of what is new in this version.

## A.1.2 Man Pages

Man pages are an essential part of any Linux system. They explain the usage of a command and all available options and parameters. Man pages can be accessed with `man` followed by the name of the command, for example, `man ls`.

Man pages are displayed directly in the shell. To navigate them, move up and down with `↑` and `↓`. Move between the beginning and the end of a document with `⏪` and `⏩`. End this viewing mode by pressing `[Q]`. Learn more about the `man` command itself with `man man`. Man pages are sorted in categories as shown in [Таблица A.1, «Man Pages—Categories and Descriptions»](#) (стр. 235) (taken from the `man` page for `man` itself).

Таблица A.1 Man Pages—Categories and Descriptions

Number	Description
1	Executable programs or shell commands
2	System calls (functions provided by the Kernel)
3	Library calls (functions within program libraries)
4	Special files (usually found in <code>/dev</code> )
5	File formats and conventions ( <code>/etc/fstab</code> )
6	Games

Number	Description
7	Miscellaneous (including macro packages and conventions), for example, <code>man(7)</code> , <code>groff(7)</code>
8	System administration commands (usually only for <code>root</code> )
9	Kernel routines (nonstandard)

Each man page consists of several parts labeled NAME , SYNOPSIS , DESCRIPTION , SEE ALSO , LICENSING , and AUTHOR . There may be additional sections available depending on the type of command.

### A.1.3 Info Pages

Info pages are another important source of information on your system. Usually, they are more detailed than man pages. To view the info page for a certain command, enter `info` followed by the name of the command, for example, `info ls`. You can browse an info page with a viewer directly in the shell and display the different sections, called «nodes». Use `h` to move forward and `b` to move backwards. Within a node, you can also browse with `u` and `d` but only `u` and `d` will take you also to the previous or subsequent node. Press `Q` to end the viewing mode. Not every man page comes with an info page and vice versa.

### A.1.4 Online Resources

In addition to the online versions of the openSUSE manuals installed under `/usr/share/doc`, you can also access the product-specific manuals and documentation on the Web. For an overview of all documentation available for check out your product-specific documentation Web page at <http://doc.opensuse.org>.

If you are searching for additional product-related information, you can also refer to the following Web sites:

#### openSUSE Wiki

Detailed information about lots of different aspects of the openSUSE system can be found in our Wiki at <http://en.opensuse.org>. You may also contribute to each Wiki page and change or add new pages.

#### openSUSE Support Database

The openSUSE Support Database (SDB) can be found at [http://en.opensuse.org/Portal:Support\\_database](http://en.opensuse.org/Portal:Support_database). It features articles written as solutions for technical problems with . They cover issues from installation and configuration, to workarounds for bugs and missing features.

### openSUSE Forums

There are several openSUSE forums where you can dive in on discussions about openSUSE, or get support. See [http://en.opensuse.org/openSUSE:Forums\\_list](http://en.opensuse.org/openSUSE:Forums_list) for a list.

### KDE Documentation

Find documentation for many aspects of KDE suitable for users and administrators at <http://www.kde.org/documentation/>.

### GNOME Documentation

Documentation for GNOME users, administrators and developers is available at <http://library.gnome.org/>.

### The Linux Documentation Project

The Linux Documentation Project (TLPD) is run by a team of volunteers who write Linux-related documentation (see <http://www.tldp.org>). It's probably the most comprehensive documentation resource for Linux. The set of documents contains tutorials for beginners, but is mainly focused on experienced users and professional system administrators. TLPD publishes HOWTOs, FAQs, and guides (handbooks) under a free license. Parts of the documentation from TLPD is also available on

You may also want to try general-purpose search engines. For example, use search terms `Linux CD-RW help` or `OpenOffice file conversion problem` if you have trouble with burning CDs or LibreOffice file conversion. Google™ also has a Linux-specific search engine at <http://www.google.com/linux> that you might find useful.

## A.2 Common Problems and Their Solutions

This chapter describes a range of potential problems and their solutions. Even if your situation is not precisely listed here, there may be one similar enough to offer hints to the solution of your problem.

### A.2.1 Finding and Gathering Information

Linux reports things in a very detailed way. There are several places to look when you encounter problems with your system, most of which are standard to Linux systems in general, and some of which are relevant to systems. Most log files can be viewed with YaST (Miscellaneous > Start-Up Log).

A list of the most frequently checked log files follows with the description of their typical purpose. Paths containing ~ refer to the current user's home directory.

Таблица А.2 Log Files

Log File	Description
<code>~/.xsession-errors</code>	Messages from the desktop applications currently running.
<code>/var/log/apparmor/</code>	Log files from AppArmor, see Часть “Ограничение привилегий с AppArmor” (↑Руководство по безопасности) for detailed information.
<code>/var/log/boot.msg</code>	Messages from the kernel reported during the boot process.
<code>/var/log/mail.*</code>	Messages from the mail system.
<code>/var/log/messages</code>	Ongoing messages from the kernel and system log daemon (when running).
<code>/var/log/NetworkManager</code>	Log file from NetworkManager to collect problems with network connectivity
<code>/var/log/samba/</code>	Directory containing Samba server and client log messages.
<code>/var/log/SaX.log</code>	Hardware messages from the SaX display and KVM system.
<code>/var/log/warn</code>	All messages from the kernel and system log daemon with the «warning» level or higher.
<code>/var/log/wtmp</code>	Binary file containing user login records for the current machine session. View it with <code>last</code> .
<code>/var/log/Xorg.*.log</code>	Various start-up and runtime logs from the X Window system. It is useful for debugging failed X start-ups.

Log File	Description
<code>/var/log/YaST2/</code>	Directory containing YaST's actions and their results.
<code>/var/log/zypper.log</code>	Log file of zypper.

Apart from log files, your machine also supplies you with information about the running system. See [Таблица A.3: System Information With the `/proc` File System](#)

Таблица A.3 System Information With the `/proc` File System

File	Description
<code>/proc/cpuinfo</code>	Contains processor information, including its type, make, model, and performance.
<code>/proc/dma</code>	Shows which DMA channels are currently being used.
<code>/proc/interrupts</code>	Shows which interrupts are in use, and how many of each have been in use.
<code>/proc/iomem</code>	Displays the status of I/O (input/output) memory.
<code>/proc/ioports</code>	Shows which I/O ports are in use at the moment.
<code>/proc/meminfo</code>	Displays memory status.
<code>/proc/modules</code>	Displays the individual modules.
<code>/proc/mounts</code>	Displays devices currently mounted.
<code>/proc/partitions</code>	Shows the partitioning of all hard disks.
<code>/proc/version</code>	Displays the current version of Linux.

Apart from the `/proc` file system, the Linux kernel exports information with the `sysfs` module, an in-memory filesystem. This module represents kernel objects, their attributes and relationships. For more information about `sysfs`, see the context of

udev in Глава 8, Dynamic Kernel Device Management with *udev* (↑Содержание).  
Таблица А.4 contains an overview of the most common directories under */sys*.

Таблица А.4 System Information With the */sys* File System

File	Description
<i>/sys/block</i>	Contains subdirectories for each block device discovered in the system. Generally, these are mostly disk type devices.
<i>/sys/bus</i>	Contains subdirectories for each physical bus type.
<i>/sys/class</i>	Contains subdirectories grouped together as a functional types of devices (like graphics, net, printer, etc.)
<i>/sys/device</i>	Contains the global device hierarchy.

Linux comes with a number of tools for system analysis and monitoring. See Chapter 2, System Monitoring Utilities (↑System Analysis and Tuning Guide) for a selection of the most important ones used in system diagnostics.

Each of the following scenarios begins with a header describing the problem followed by a paragraph or two offering suggested solutions, available references for more detailed solutions, and cross-references to other scenarios that are related.

## A.2.2 Installation Problems

Installation problems are situations when a machine fails to install. It may fail entirely or it may not be able to start the graphical installer. This section highlights some of the typical problems you may run into, and offers possible solutions or workarounds for these kinds of situations.

### A.2.2.1 Checking Media

If you encounter any problems using the installation media, check the integrity of your installation media. Boot from the media and choose Check Installation Media from the boot menu. In a running system, start YaST and choose Software > Media Check. Media problems are more probable with the media you burn yourself. Burning the media at a low speed (4x) helps avoiding problems.

### A.2.2.2 Hardware Information

Display detected hardware and technical data using Hardware > Hardware Information. Click any node of the tree for more information about a device. This module is especially



useful, when submitting a support request for which you need information about your hardware.

Save the displayed hardware information to a file by clicking Save to File. Select the desired directory and filename then click Save to create the file.

### A.2.2.3 No Bootable DVD Drive Available

If your computer does not contain a bootable DVD-ROM drive or if the one you have is not supported by Linux, there are several options you can install your machine without a built-in DVD drive:

#### Using an External Boot Device

If it is supported by your BIOS and the installation kernel, boot from external DVD drives or USB storage devices.

#### Network Boot via PXE

If a machine lacks a DVD drive, but provides a working ethernet connection, perform a completely network-based installation. See Раздел "Remote Installation via VNC—PXE Boot and Wake on LAN" (Глава 2, Remote Installation, ↑Содержание) and Раздел "Remote Installation via SSH—PXE Boot and Wake on LAN" (Глава 2, Remote Installation, ↑Содержание) for details.

#### External Boot Devices

Linux supports most existing DVD drives. If the system has neither a DVD drive nor a floppy disk, it is still possible that an external DVD drive, connected through USB, FireWire, or SCSI, can be used to boot the system. This depends mainly on the interaction of the BIOS and the hardware used. Sometimes a BIOS update may help if you encounter problems.

When installing from a KDE or GNOME Live CD, you can also create a «Live USB stick» to boot from. Refer to [http://en.opensuse.org/Live\\_USB\\_stick](http://en.opensuse.org/Live_USB_stick) for detailed instructions.

### A.2.2.4 Booting from Installation Media Fails

One reason why a machine does not boot the installation media can be an incorrect boot sequence setting in BIOS. The BIOS boot sequence must have DVD drive set as the first entry for booting. Otherwise the machine would try to boot from another medium, typically the hard disk. Guidance for changing the BIOS boot sequence can be found the documentation provided with your motherboard, or in the following paragraphs.

The BIOS is the software that enables the very basic functions of a computer. Motherboard vendors provide a BIOS specifically made for their hardware. Normally, the BIOS setup can only be accessed at a specific time—when the machine is booting. During this initialization phase, the machine performs a number of diagnostic hardware tests. One of them is a memory check, indicated by a memory counter. When the counter appears, look for a line, usually below the counter or somewhere at the bottom, mentioning the key to press to access the BIOS setup. Usually the key to press is one of [Del], [F1], or [Esc]. Press this key until the BIOS setup screen appears.

## Процедура A.1 Changing the BIOS Boot Sequence

- 1 Enter the BIOS using the proper key as announced by the boot routines and wait for the BIOS screen to appear.
- 2 To change the boot sequence in an AWARD BIOS, look for the BIOS FEATURES SETUP entry. Other manufacturers may have a different name for this, such as ADVANCED CMOS SETUP. When you have found the entry, select it and confirm with [Enter].
- 3 In the screen that opens, look for a subentry called BOOT SEQUENCE or BOOT ORDER. The boot sequence looks something like C, A or A, C. In the former case, the machine first searches the hard disk (C) then the floppy drive (A) to find a bootable medium. Change the settings by pressing [PgUp] or [PgDown] until the sequence is A, CDROM, C.
- 4 Leave the BIOS setup screen by pressing [Esc]. To save the changes, select SAVE & EXIT SETUP, or press [F10]. To confirm that your settings should be saved, press [Y].

## Процедура A.2 Changing the Boot Sequence in a SCSI BIOS (Adaptec Host Adapter)

- 1 Open the setup by pressing [Ctrl] + [A].
- 2 Select Disk Utilities. The connected hardware components are now displayed. Make note of the SCSI ID of your DVD drive.
- 3 Exit the menu with [Esc].
- 4 Open Configure Adapter Settings. Under Additional Options, select Boot Device Options and press [Enter].
- 5 Enter the ID of the DVD drive and press [Enter] again.
- 6 Press [Esc] twice to return to the start screen of the SCSI BIOS.
- 7 Exit this screen and confirm with Yes to boot the computer.

Regardless of what language and keyboard layout your final installation will be using, most BIOS configurations use the US keyboard layout as depicted in the following figure:

Рисунок A.1 US Keyboard Layout

### A.2.2.5 Fails to Boot

Some hardware types, mainly very old or very recent ones, fail to install. In many cases, this may happen because support for this type of hardware is missing in the installation kernel, or due to certain functionality included in this kernel, such as ACPI, that can still cause problems on some hardware.

If your system fails to install using the standard Installation mode from the first installation boot screen, try the following:

- 1 With the DVD still in the drive, reboot the machine with `[ ] + [ ] + [ ]` or using the hardware reset button.
- 2 When the boot screen appears, press `[F5]`, use the arrow keys of your keyboard to navigate to No ACPI and press `[ ]` to launch the boot and installation process. This option disables the support for ACPI power management techniques.
- 3 Proceed with the installation as described in Глава 1, Installation with YaST (Содержание).

If this fails, proceed as above, but choose Safe Settings instead. This option disables ACPI and DMA support. Most hardware will boot with this option.

If both of these options fail, use the boot options prompt to pass any additional parameters needed to support this type of hardware to the installation kernel. For more information about the parameters available as boot options, refer to the kernel documentation located in `/usr/src/linux/Documentation/kernel-parameters.txt`.

---

#### ПОДСКАЗКА: Obtaining Kernel Documentation

Install the `kernel-source` package to view the kernel documentation.

---

There are various other ACPI-related kernel parameters that can be entered at the boot prompt prior to booting for installation:

`acpi=off`

This parameter disables the complete ACPI subsystem on your computer. This may be useful if your computer cannot handle ACPI at all or if you think ACPI in your computer causes trouble.

`acpi=force`

Always enable ACPI even if your computer has an old BIOS dated before the year 2000. This parameter also enables ACPI if it is set in addition to `acpi=off`.

`acpi=noirq`

Do not use ACPI for IRQ routing.

`acpi=ht`

Run only enough ACPI to enable hyper-threading.

`acpi=strict`

Be less tolerant of platforms that are not strictly ACPI specification compliant.

`pci=noacpi`

Disable PCI IRQ routing of the new ACPI system.

`pnpacpi=off`

This option is for serial or parallel problems when your BIOS setup contains wrong interrupts or ports.

`notsc`

Disable the time stamp counter. This option can be used to work around timing problems on your systems. It is a recent feature, if you see regressions on your machine, especially time related or even total hangs, this option is worth a try.

`nohz=off`

Disable the nohz feature. If your machine hangs, this option may help. Otherwise it is of no use.

Once you have determined the right parameter combination, YaST automatically writes them to the boot loader configuration to make sure that the system boots properly next time.

If unexplainable errors occur when the kernel is loaded or during the installation, select Memory Test in the boot menu to check the memory. If Memory Test returns an error, it is usually a hardware error.

### A.2.2.6 Fails to Launch Graphical Installer

After you insert the medium into your drive and reboot your machine, the installation screen comes up, but after you select Installation, the graphical installer does not start.

There are several ways to deal with this situation:

- Try to select another screen resolution for the installation dialogs.
- Select Text Mode for installation.
- Do a remote installation via VNC using the graphical installer.

#### Процедура A.3 Change Screen Resolution for Installation

- 1 Boot for installation.
- 2 Press [F3] to open a menu from which to select a lower resolution for installation purposes.
- 3 Select Installation and proceed with the installation as described in Глава 1, Installation with YaST (↑Содержание).

#### Процедура A.4 Installation in Text Mode

- 1 Boot for installation.
- 2 Press [F3] and select Text Mode.
- 3 Select Installation and proceed with the installation as described in Глава 1, Installation with YaST (↑Содержание).

#### Процедура A.5 VNC Installation

- 1 Boot for installation.
- 2 Enter the following text at the boot options prompt:

```
vnc=1 vncpassword=some_password
```

Replace *some\_password* with the password to use for VNC installation.

- 3 Select Installation then press **[ ]** to start the installation .

Instead of starting right into the graphical installation routine, the system continues to run in a text mode, then halts, displaying a message containing the IP address and port number at which the installer can be reached via a browser interface or a VNC viewer application.

- 4 If using a browser to access the installer, launch the browser and enter the address information provided by the installation routines on the future machine and hit **[ ]**:

```
http://ip_address_of_machine:5801
```

A dialog opens in the browser window prompting you for the VNC password. Enter it and proceed with the installation as described in Глава 1, Installation with YaST (↑Содержание).

---

#### ВАЖНО

Installation via VNC works with any browser under any operating system, provided Java support is enabled.

---

Provide the IP address and password to your VNC viewer when prompted. A window opens, displaying the installation dialogs. Proceed with the installation as usual.

### A.2.2.7 Only Minimalistic Boot Screen Started

You inserted the medium into the drive, the BIOS routines are finished, but the system does not start with the graphical boot screen. Instead it launches a very minimalistic text-based interface. This may happen on any machine not providing sufficient graphics memory for rendering a graphical boot screen.

Although the text boot screen looks minimalistic, it provides nearly the same functionality as the graphical one:

#### Boot Options

Unlike the graphical interface, the different boot options cannot be selected using the cursor keys of your keyboard. The boot menu of the text mode boot screen offers some keywords to enter at the boot prompt. These keywords map to the options offered in the graphical version. Enter your choice and hit **[ ]** to launch the boot process.

#### Custom Boot Options

After selecting a boot option, enter the appropriate keyword at the boot prompt or enter some custom boot options as described in [Раздел A.2.2.5, «Fails to Boot»](#) (стр. 242). To launch the installation process, press **[ ]**.

## Screen Resolutions

Use the F keys to determine the screen resolution for installation. If you need to boot in text mode, choose [F3].

## A.2.3 Boot Problems

Boot problems are situations when your system does not boot properly (does not boot to the expected runlevel and login screen).

### A.2.3.1 Fails to Load the GRUB Boot Loader

If the hardware is functioning properly, it is possible that the boot loader is corrupted and Linux cannot start on the machine. In this case, it is necessary to repair the boot loader. To do so, you need start the Rescue System as described in [Паз-дел A.2.7, «Recovering a Corrupted System»](#) (стр. 258) and follow the instructions at [«Modifying and Reinstalling the Boot Loader»](#) (стр. 261).

Other reasons for the machine not booting may be BIOS-related:

#### BIOS Settings

Check your BIOS for references to your hard drive. GRUB may simply not be started if the hard drive itself cannot be found with the current BIOS settings.

#### BIOS Boot Order

Check whether your system's boot order includes the hard disk. If the hard disk option was not enabled, your system may install properly, but fails to boot when access to the hard disk is required.

### A.2.3.2 No Graphical Login

If the machine comes up, but does not boot into the graphical login manager, anticipate problems either with the choice of the default runlevel or the configuration of the X Window System. To check the runlevel configuration, log in as the `root` user and check whether the machine is configured to boot into runlevel 5 (graphical desktop). A quick way to check this is to examine the contents of `/etc/inittab`, as follows:

```
tux@mercury:~> grep "id:" /etc/inittab
id:5:initdefault:
```

The returned line indicates that the machine's default runlevel (`initdefault`) is set to 5 and that it should boot to the graphical desktop. If the runlevel is set to any other number, use the YaST Runlevel Editor module to set it to 5.

---

## БАЖНО

Do not edit the runlevel configuration manually. Otherwise `SuSEconfig` (run by YaST) will overwrite these changes on its next run. If you need to make manual changes here, disable future `SuSEconfig` changes by setting `CHECK_INITTAB` in `/etc/sysconfig/suseconfig` to `no`.

---

If the runlevel is set to 5, your desktop or X Windows software is probably misconfigured or corrupted. Examine the log files at `/var/log/Xorg.*.log` for detailed messages from the X server as it attempted to start. If the desktop fails during start, it may log error messages to `/var/log/messages`. If these error messages hint at a configuration problem in the X server, try to fix these issues. If the graphical system still does not come up, consider reinstalling the graphical desktop.

---

#### ПОДСКАЗКА: Starting X Window System Manually

One quick test: the `startx` command should force the X Window System to start with the configured defaults if the user is currently logged in on the console. If that does not work, it should log errors to the console.

---

## A.2.4 Login Problems

Login problems are those where your machine does, in fact, boot to the expected welcome screen or login prompt, but refuses to accept the username and password, or accepts them but then does not behave properly (fails to start the graphic desktop, produces errors, drops to a command line, etc.).

### A.2.4.1 Valid Username and Password Combinations Fail

This usually occurs when the system is configured to use network authentication or directory services and, for some reason, is unable to retrieve results from its configured servers. The `root` user, as the only local user, is the only user that can still log in to these machines. The following are some common reasons why a machine appears functional but is unable to process logins correctly:

- The network is not working. For further directions on this, turn to [Раздел A.2.5, «Network Problems»](#) (стр. 252).
- DNS is not working at the moment (which prevents GNOME or KDE from working and the system from making validated requests to secure servers). One indication that this is the case is that the machine takes an extremely long time to respond to any action. Find more information about this topic in [Раздел A.2.5, «Network Problems»](#) (стр. 252).
- If the system is configured to use Kerberos, the system's local time may have drifted past the accepted variance with the Kerberos server time (this is typically 300 seconds). If NTP (network time protocol) is not working properly or local NTP servers are not working, Kerberos authentication ceases to function because it depends on common clock synchronization across the network.
- The system's authentication configuration is misconfigured. Check the PAM configuration files involved for any typographical errors or misordering of directives. For additional background information about PAM and the syntax of the configuration files involved, refer to Глава 2, Авторизация с помощью PAM (↑Руководство по безопасности).
- The home partition is encrypted. Find more information about this topic in [Раздел A.2.4.3, «Login to Encrypted Home Partition Fails»](#) (стр. 250).

In all cases that do not involve external network problems, the solution is to reboot the system into single-user mode and repair the configuration before booting again into operating mode and attempting to log in again. To boot into single-user mode:

- 1 Reboot the system. The boot screen appears, offering a prompt.
- 2 Enter `1` at the boot prompt to make the system boot into single-user mode.
- 3 Enter the username and password for `root`.
- 4 Make all the necessary changes.
- 5 Boot into the full multiuser and network mode by entering `telinit 5` at the command line.

#### A.2.4.2 Valid Username and Password Not Accepted

This is by far the most common problem users encounter, because there are many reasons this can occur. Depending on whether you use local user management and authentication or network authentication, login failures occur for different reasons.

Local user management can fail for the following reasons:

- The user may have entered the wrong password.
- The user's home directory containing the desktop configuration files is corrupted or write protected.
- There may be problems with the X Window System authenticating this particular user, especially if the user's home directory has been used with another Linux distribution prior to installing the current one.

To locate the reason for a local login failure, proceed as follows:

- 1 Check whether the user remembered his password correctly before you start debugging the whole authentication mechanism. If the user may not remember his password correctly, use the YaST User Management module to change the user's password. Pay attention to the [Caps Lock] key and unlock it, if necessary.
- 2 Log in as `root` and check `/var/log/messages` for error messages of the login process and of PAM.
- 3 Try to log in from a console (using `Ctrl + Alt + F1`). If this is successful, the blame cannot be put on PAM, because it is possible to authenticate this user on this machine. Try to locate any problems with the X Window System or the desktop (GNOME or KDE). For more information, refer to [Раздел A.2.4.4, «Login Successful but GNOME Desktop Fails»](#) (стр. 251) and [Раздел A.2.4.5, «Login Successful but KDE Desktop Fails»](#) (стр. 251).
- 4 If the user's home directory has been used with another Linux distribution, remove the `Xauthority` file in the user's home. Use a console login via `Ctrl + Alt + F1`.



+ [] + [F1] and run `rm .Xauthority` as this user. This should eliminate X authentication problems for this user. Try graphical login again.

- 5 If graphical login still fails, do a console login with [] + [] + [F1]. Try to start an X session on another display—the first one (: 0) is already in use:

```
startx -- :1
```

This should bring up a graphical screen and your desktop. If it does not, check the log files of the X Window System (`/var/log/Xorg.displaynumber.log`) or the log file for your desktop applications (`.xsession-errors` in the user's home directory) for any irregularities.

- 6 If the desktop could not start because of corrupt configuration files, proceed with [Раздел A.2.4.4, «Login Successful but GNOME Desktop Fails»](#) (стр. 251) or [Раздел A.2.4.5, «Login Successful but KDE Desktop Fails»](#) (стр. 251).

The following are some common reasons why network authentication for a particular user may fail on a specific machine:

- The user may have entered the wrong password.
- The username exists in the machine's local authentication files and is also provided by a network authentication system, causing conflicts.
- The home directory exists but is corrupt or unavailable. Perhaps it is write protected or is on a server that is inaccessible at the moment.
- The user does not have permission to log in to that particular host in the authentication system.
- The machine has changed hostnames, for whatever reason, and the user does not have permission to log in to that host.
- The machine cannot reach the authentication server or directory server that contains that user's information.
- There may be problems with the X Window System authenticating this particular user, especially if the user's home has been used with another Linux distribution prior to installing the current one.

To locate the cause of the login failures with network authentication, proceed as follows:

- 1 Check whether the user remembered their password correctly before you start debugging the whole authentication mechanism.
- 2 Determine the directory server which the machine relies on for authentication and make sure that it is up and running and properly communicating with the other machines.
- 3 Determine that the user's username and password work on other machines to make sure that his authentication data exists and is properly distributed.

- 4 See if another user can log in to the misbehaving machine. If another user can log in without difficulty or if `root` can log in, log in and examine the `/var/log/messages` file. Locate the time stamps that correspond to the login attempts and determine if PAM has produced any error messages.
- 5 Try to log in from a console (using `[] + [] + [F1]`). If this is successful, the problem is not with PAM or the directory server on which the user's home is hosted, because it is possible to authenticate this user on this machine. Try to locate any problems with the X Window System or the desktop (GNOME or KDE). For more information, refer to [Раздел A.2.4.4, «Login Successful but GNOME Desktop Fails»](#) (стр. 251) and [Раздел A.2.4.5, «Login Successful but KDE Desktop Fails»](#) (стр. 251).
- 6 If the user's home directory has been used with another Linux distribution, remove the `Xauthority` file in the user's home. Use a console login via `[] + [] + [F1]` and run `rm .Xauthority` as this user. This should eliminate X authentication problems for this user. Try graphical login again.
- 7 If graphical login still fails, do a console login with `[] + [] + [F1]`. Try to start an X session on another display—the first one (`:0`) is already in use:

```
startx -- :1
```

This should bring up a graphical screen and your desktop. If it does not, check the log files of the X Window System (`/var/log/Xorg.displaynumber.log`) or the log file for your desktop applications (`.xsession-errors` in the user's home directory) for any irregularities.

- 8 If the desktop could not start because of corrupt configuration files, proceed with [Раздел A.2.4.4, «Login Successful but GNOME Desktop Fails»](#) (стр. 251) or [Раздел A.2.4.5, «Login Successful but KDE Desktop Fails»](#) (стр. 251).

### A.2.4.3 Login to Encrypted Home Partition Fails

It is recommended to use an encrypted home partition for laptops. If you cannot log in to your laptop, the reason is usually simple: your partition could not be unlocked.

During the boot time, you have to enter the passphrase to unlock your encrypted partition. If you do not enter it, the boot process continues, leaving the partition locked.

To unlock your encrypted partition, proceed as follows:

- 1 Switch to the text console with `[] + [] + [F1]`.
- 2 Become `root`.
- 3 Restart the unlocking process again with:

```
/etc/init.d/boot.crypto restart
```

- 4 Enter your passphrase to unlock your encrypted partition.

- 5 Exit the text console and switch back to the login screen with `[] + [F7]`.
- 6 Log in as usual.

#### A.2.4.4 Login Successful but GNOME Desktop Fails

If this is the case, it is likely that your GNOME configuration files have become corrupted. Some symptoms may include the keyboard failing to work, the screen geometry becoming distorted, or even the screen coming up as a bare gray field. The important distinction is that if another user logs in, the machine works normally. It is then likely that the problem can be fixed relatively quickly by simply moving the user's GNOME configuration directory to a new location, which causes GNOME to initialize a new one. Although the user is forced to reconfigure GNOME, no data is lost.

- 1 Switch to a text console by pressing `[] + [] + [F1]`.
- 2 Log in with your user name.
- 3 Move the user's GNOME configuration directories to a temporary location:

```
mv .gconf .gconf-ORIG-RECOVER
mv .gnome2 .gnome2-ORIG-RECOVER
```
- 4 Log out.
- 5 Log in again, but do not run any applications.
- 6 Recover your individual application configuration data (including the Evolution e-mail client data) by copying the `~/.gconf-ORIG-RECOVER/apps/` directory back into the new `~/.gconf` directory as follows:

```
cp -a .gconf-ORIG-RECOVER/apps .gconf/
```

If this causes the login problems, attempt to recover only the critical application data and reconfigure the remainder of the applications.

#### A.2.4.5 Login Successful but KDE Desktop Fails

There are several reasons why a KDE desktop would not allow users to login. Corrupted cache data can cause login problems as well as corrupt KDE desktop configuration files.

Cache data is used at desktop start-up to increase performance. If this data is corrupted, start-up is slowed down or fails entirely. Removing them forces the desktop start-up routines to start from scratch. This takes more time than a normal start-up, but data is intact after this and the user can login.

To remove the cache files of the KDE desktop, issue the following command as `root`:

```
rm -rf /tmp/kde-user /tmp/ksocket-user
```

Replace `user` with your username. Removing these two directories just removes the corrupted cache files. No real data is harmed using this procedure.

Corrupted desktop configuration files can always be replaced with the initial configuration files. If you want to recover the user's adjustments, carefully copy them back from their temporary location after the configuration has been restored, using the default configuration values.

To replace a corrupted desktop configuration with the initial configuration values, proceed as follows:

- 1 Switch to a text console by pressing `Ctrl + Alt + [F1]`.
- 2 Log in with your username.
- 3 Move the KDE configuration directory and the `.skel` files to a temporary location:
  - For KDE3 use these commands:

```
mv .kde .kde-ORIG-RECOVER
mv .skel .skel-ORIG-RECOVER
```
  - For KDE4 use these commands:

```
mv .kde4 .kde4-ORIG-RECOVER
mv .skel .skel-ORIG-RECOVER
```
- 4 Log out.
- 5 Log in again.
- 6 After the desktop has started successfully, copy the user's own configurations back into place:

```
cp -a KDEDIR/share .kde/share
```

Replace *KDEDIR* with the directory from [Шаг 3](#) (стр. 252).

---

#### ВАЖНО

If the user's own adjustments caused the login to fail and continue to do so, repeat the procedure as described above, but do not copy the `.kde/share` directory.

---

## A.2.5 Network Problems

Many problems of your system may be network-related, even though they do not seem to be at first. For example, the reason for a system not allowing users to log in may be a network problem of some kind. This section introduces a simple check list you can apply to identify the cause of any network problem encountered.

### Процедура A.6 How to Identify Network Problems

When checking the network connection of your machine, proceed as follows:

- 1 If you use an ethernet connection, check the hardware first. Make sure that your network cable is properly plugged into your computer and router (or hub, etc.). The control lights next to your ethernet connector are normally both be active.

If the connection fails, check whether your network cable works with another machine. If it does, your network card causes the failure. If hubs or switches are included in your network setup, they may be faulty, as well.

- 2 If using a wireless connection, check whether the wireless link can be established by other machines. If not, contact the wireless network's administrator.
- 3 Once you have checked your basic network connectivity, try to find out which service is not responding. Gather the address information of all network servers needed in your setup. Either look them up in the appropriate YaST module or ask your system administrator. The following list gives some of the typical network servers involved in a setup together with the symptoms of an outage.

#### DNS (Name Service)

A broken or malfunctioning name service affects the network's functionality in many ways. If the local machine relies on any network servers for authentication and these servers cannot be found due to name resolution issues, users would not even be able to log in. Machines in the network managed by a broken name server would not be able to «see» each other and communicate.

#### NTP (Time Service)

A malfunctioning or completely broken NTP service could affect Kerberos authentication and X server functionality.

#### NFS (File Service)

If any application needs data stored in an NFS mounted directory, it will not be able to start or function properly if this service was down or misconfigured. In the worst case scenario, a user's personal desktop configuration would not come up if their home directory containing the `.gconf` or `.kde` subdirectories could not be found due to a faulty NFS server.

#### Samba (File Service)

If any application needs data stored in a directory on a faulty Samba server, it will not be able to start or function properly.

#### NIS (User Management)

If your system relies on a faulty NIS server to provide the user data, users will not be able to log in to this machine.

#### LDAP (User Management)

If your system relies on a faulty LDAP server to provide the user data, users will not be able to log in to this machine.

#### Kerberos (Authentication)

Authentication will not work and login to any machine fails.

CUPS (Network Printing)  
Users cannot print.

- 4 Check whether the network servers are running and whether your network setup allows you to establish a connection:

---

БАЖХО

The debugging procedure described below only applies to a simple network server/client setup that does not involve any internal routing. It assumes both server and client are members of the same subnet without the need for additional routing.

---

- 4a Use `ping IP address` or `hostname` (replace `hostname` with the hostname of the server) to check whether each one of them is up and responding to the network. If this command is successful, it tells you that the host you were looking for is up and running and that the name service for your network is configured correctly.

If ping fails with `destination host unreachable`, either your system or the desired server is not properly configured or down. Check whether your system is reachable by running `ping IP address` or `your_hostname` from another machine. If you can reach your machine from another machine, it is the server that is not running at all or not configured correctly.

If ping fails with `unknown host`, the name service is not configured correctly or the hostname used was incorrect. For further checks on this matter, refer to [Шар 4b](#) (стр. 254). If ping still fails, either your network card is not configured correctly or your network hardware is faulty.

- 4b Use `host hostname` to check whether the hostname of the server you are trying to connect to is properly translated into an IP address and vice versa. If this command returns the IP address of this host, the name service is up and running. If the `host` command fails, check all network configuration files relating to name and address resolution on your host:

`/etc/resolv.conf`

This file is used to keep track of the name server and domain you are currently using. It can be modified manually or automatically adjusted by YaST or DHCP. Automatic adjustment is preferable. However, make sure that this file has the following structure and all network addresses and domain names are correct:

```
search fully_qualified_domain_name
nameserver ipaddress_of_nameserver
```

This file can contain more than one name server address, but at least one of them must be correct to provide name resolution to your host. If needed, adjust this file using the YaST Network Setting module (Hostname/DNS tab).

If your network connection is handled via DHCP, enable DHCP to change hostname and name service information by selecting Change Hostname via DHCP and Update Name Servers and Search List via DHCP in the YaST DNS and Hostname module.

`/etc/nsswitch.conf`

This file tells Linux where to look for name service information. It should look like this:

```
...
hosts: files dns
networks: files dns
...
```

The `dns` entry is vital. It tells Linux to use an external name server. Normally, these entries are automatically managed by YaST, but it would be prudent to check.

If all the relevant entries on the host are correct, let your system administrator check the DNS server configuration for the correct zone information. For detailed information about DNS, refer to Глава 11, The Domain Name System (↑Содержание). If you have made sure that the DNS configuration of your host and the DNS server are correct, proceed with checking the configuration of your network and network device.

- 4c If your system cannot establish a connection to a network server and you have excluded name service problems from the list of possible culprits, check the configuration of your network card.

Use the command `ifconfig network_device` (executed as `root`) to check whether this device was properly configured. Make sure that both `inet address` and `Mask` are configured correctly. An error in the IP address or a missing bit in your network mask would render your network configuration unusable. If necessary, perform this check on the server as well.

- 4d If the name service and network hardware are properly configured and running, but some external network connections still get long time-outs or fail entirely, use `traceroute fully_qualified_domain_name` (executed as `root`) to track the network route these requests are taking. This command lists any gateway (hop) that a request from your machine passes on its way to its destination. It lists the response time of each hop and whether

this hop is reachable at all. Use a combination of traceroute and ping to track down the culprit and let the administrators know.

Once you have identified the cause of your network trouble, you can resolve it yourself (if the problem is located on your machine) or let the system administrators of your network know about your findings so they can reconfigure the services or repair the necessary systems.

### A.2.5.1 NetworkManager Problems

If you have a problem with network connectivity, narrow it down as described in [Процедура A.6, «How to Identify Network Problems»](#) (стр. 252). If NetworkManager seems to be the culprit, proceed as follows to get logs providing hints on why NetworkManager fails:

- 1 Open a shell and log in as `root`.
- 2 Restart the NetworkManager:  

```
rcnetwork restart -o nm
```
- 3 Open a web page, for example, <http://www.opensuse.org> as normal user to see, if you can connect.
- 4 Collect any information about the state of NetworkManager in `/var/log/NetworkManager`.

For more information about NetworkManager, refer to Глава 21, Using NetworkManager (↑Содержание).

## A.2.6 Data Problems

Data problems are when the machine may or may not boot properly but, in either case, it is clear that there is data corruption on the system and that the system needs to be recovered. These situations call for a backup of your critical data, enabling you to recover the system state from before your system failed. offers dedicated YaST modules for system backup and restoration as well as a rescue system that can be used to recover a corrupted system from the outside.

### A.2.6.1 Managing Partition Images

Sometimes you need to perform a backup from an entire partition or even hard disk. Linux comes with the `dd` tool which can create an exact copy of your disc. Combined with `gzip` you save some space.

#### Процедура A.7 Backing up and Restoring Harddisks

- 1 Start a Shell as user `root`.



- 2 Select your source device. Typically this is something like `/dev/sda` (labeled as *SOURCE*).
- 3 Decide where you want to store your image (labeled as *BACKUP\_PATH*). It must be different from your source device. In other words: if you make a backup from `/dev/sda`, your image file must not be stored under `/dev/sda`.
- 4 Run the commands to create a compressed image file:  

```
dd if=/dev/SOURCE | gzip > /BACKUP_PATH/image.gz
```
- 5 Restore the hard disk with the following commands:  

```
gzip -dc /BACKUP_PATH/image.gz | dd of=/dev/SOURCE
```

If you only need a partition to backup, replace the *SOURCE* placeholder with your respective partition. In this case, your image file can lie on the same hard disk, but on a different partition.

### A.2.6.2 Backing Up Critical Data

System backups can be easily managed using the YaST System Backup module:

- 1 As `root`, start YaST and select System > System Backup.
- 2 Create a backup profile holding all details needed for the backup, filename of the archive file, scope, and type of the backup:
  - 2a Select Profile Management > Add.
  - 2b Enter a name for the archive.
  - 2c Enter the path to the location of the backup if you want to keep a local backup. For your backup to be archived on a network server (via NFS), enter the IP address or name of the server and the directory that should hold your archive.
  - 2d Determine the archive type and click Next.
  - 2e Determine the backup options to use, such as whether files not belonging to any package should be backed up and whether a list of files should be displayed prior to creating the archive. Also determine whether changed files should be identified using the time-consuming MD5 mechanism.  
  
Use Expert to enter a dialog for the backup of entire hard disk areas. Currently, this option only applies to the Ext2 file system.
  - 2f Finally, set the search constraints to exclude certain system areas from the backup area that do not need to be backed up, such as lock files or cache files. Add, edit, or delete items until your needs are met and leave with OK.

- 3 Once you have finished the profile settings, you can start the backup right away with Create Backup or configure automatic backup. It is also possible to create other profiles tailored for various other purposes.

To configure automatic backup for a given profile, proceed as follows:

- 1 Select Automatic Backup from the Profile Management menu.
- 2 Select Start Backup Automatically.
- 3 Determine the backup frequency. Choose daily, weekly, or monthly.
- 4 Determine the backup start time. These settings depend on the backup frequency selected.
- 5 Decide whether to keep old backups and how many should be kept. To receive an automatically generated status message of the backup process, check Send Summary Mail to User root.
- 6 Click OK to apply your settings and have the first backup start at the time specified.

### A.2.6.3 Restoring a System Backup

Use the YaST System Restoration module to restore the system configuration from a backup. Restore the entire backup or select specific components that were corrupted and need to be reset to their old state.

- 1 Start YaST > System > System Restoration.
- 2 Enter the location of the backup file. This could be a local file, a network mounted file, or a file on a removable device, such as a floppy or a DVD. Then click Next.

The following dialog displays a summary of the archive properties, such as the filename, date of creation, type of backup, and optional comments.

- 3 Review the archived content by clicking Archive Content. Clicking OK returns you to the Archive Properties dialog.
- 4 Expert Options opens a dialog in which to fine-tune the restore process. Return to the Archive Properties dialog by clicking OK.
- 5 Click Next to open the view of packages to restore. Press Accept to restore all files in the archive or use the various Select All, Deselect All, and Select Files buttons to fine-tune your selection. Only use the Restore RPM Database option if the RPM database is corrupted or deleted and this file is included in the backup.
- 6 After you click Accept, the backup is restored. Click Finish to leave the module after the restore process is completed.

### A.2.7 Recovering a Corrupted System

There are several reasons why a system could fail to come up and run properly. A corrupted file system following a system crash, corrupted configuration files, or a corrupted boot loader configuration are the most common ones.

### A.2.7.1 Using the Rescue System

contains a rescue system. The rescue system is a small Linux system that can be loaded into a RAM disk and mounted as root file system, allowing you to access your Linux partitions from the outside. Using the rescue system, you can recover or modify any important aspect of your system:

- Manipulate any type of configuration file.
- Check the file system for defects and start automatic repair processes.
- Access the installed system in a «change root» environment.
- Check, modify, and reinstall the boot loader configuration.
- Recover from a badly installed device driver or unusable kernel.
- Resize partitions using the parted command. Find more information about this tool at the GNU Parted website <http://www.gnu.org/software/parted/parted.html>.

The rescue system can be loaded from various sources and locations. The simplest option is to boot the rescue system from the original installation medium:

- 1 Insert the installation medium into your DVD drive.
- 2 Reboot the system.
- 3 At the boot screen, press [F4] and choose DVD-ROM. Then choose Rescue System from the main menu.
- 4 Enter `root` at the `Rescue:` prompt. A password is not required.

If your hardware setup does not include a DVD drive, you can boot the rescue system from a network source (including the openSUSE FTP server). The following example applies to a remote boot scenario—if using another boot medium, such as a DVD, modify the `info` file accordingly and boot as you would for a normal installation.

- 1 Enter the configuration of your PXE boot setup and add the lines `install=protocol://instsource` and `rescue=1`. If you need to start the repair system, use `repair=1` instead. As with a normal installation, *protocol* stands for any of the supported network protocols (NFS, HTTP, FTP, etc.) and *instsource* for the path to your network installation source.
- 2 Boot the system using «Wake on LAN», as described in Раздел “Wake on LAN” (Глава 2, Remote Installation, ↑Содержание).

- 3 Enter `root` at the `Rescue :` prompt. A password is not required.

Once you have entered the rescue system, you can make use of the virtual consoles that can be reached with `[] + [F1]` to `[] + [F6]`.

A shell and many other useful utilities, such as the `mount` program, are available in the `/bin` directory. The `sbin` directory contains important file and network utilities for reviewing and repairing the file system. This directory also contains the most important binaries for system maintenance, such as `fdisk`, `mkfs`, `mkswap`, `mount`, `mount`, `init`, and `shutdown`, and `ifconfig`, `ip`, `route`, and `netstat` for maintaining the network. The directory `/usr/bin` contains the `vi` editor, `find`, `less`, and `ssh`.

To see the system messages, either use the command `dmesg` or view the file `/var/log/messages`.

### Checking and Manipulating Configuration Files

As an example for a configuration that might be fixed using the rescue system, imagine you have a broken configuration file that prevents the system from booting properly. You can fix this using the rescue system.

To manipulate a configuration file, proceed as follows:

- 1 Start the rescue system using one of the methods described above.
- 2 To mount a root file system located under `/dev/sda6` to the rescue system, use the following command:

```
mount /dev/sda6 /mnt
```

All directories of the system are now located under `/mnt`

- 3 Change the directory to the mounted root file system:

```
cd /mnt
```

- 4 Open the problematic configuration file in the `vi` editor. Adjust and save the configuration.
- 5 Unmount the root file system from the rescue system:

```
umount /mnt
```

- 6 Reboot the machine.

### Repairing and Checking File Systems

Generally, file systems cannot be repaired on a running system. If you encounter serious problems, you may not even be able to mount your root file system and the system boot may end with a «kernel panic». In this case, the only way is to repair the system from the outside. The rescue system provides all tools needed for a manual file system check or repair. It contains the utilities to check and repair the `btrfs`, `ext2`, `ext3`, `ext4`, `reiserfs`, `xfs`, `dosfs`, and `vfat` file systems.

## Accessing the Installed System

If you need to access the installed system from the rescue system, you need to do this in a change root environment. For example, to modify the boot loader configuration, or to execute a hardware configuration utility.

To set up a change root environment based on the installed system, proceed as follows:

- 1 First mount the root partition from the installed system and the device file system (change the device name to your current settings):

```
mount /dev/sda6 /mnt
mount --bind /dev /mnt/dev
```

- 2 Now you can «change root» into the new environment:

```
chroot /mnt
```

- 3 Then mount `/proc` and `/sys`:

```
mount /proc
mount /sys
```

- 4 Finally, mount the remaining partitions from the installed system:

```
mount -a
```

- 5 Now you have access to the installed system. Before rebooting the system, unmount the partitions with `umount -a` and leave the «change root» environment with `exit`.

---

### ПРЕДУПРЕЖДЕНИЕ: Limitations

Although you have full access to the files and applications of the installed system, there are some limitations. The kernel that is running is the one that was booted with the rescue system, not with the change root environment. It only supports essential hardware and it is not possible to add kernel modules from the installed system unless the kernel versions are exactly the same. Always check the version of the currently running (rescue) kernel with `uname -r` and then find out if a matching subdirectory exists in the `/lib/modules` directory in the change root environment. If yes, you can use the installed modules, otherwise you need to supply their correct versions on other media, such as a USB stick. Most often the rescue kernel version differs from the installed one — then you cannot simply access a sound card, for example. It is also not possible to start a graphical user interface.

Also note that you leave the «change root» environment when you switch the console with `[] + [F1]` to `[] + [F6]`.

---

## Modifying and Reinstalling the Boot Loader

Sometimes a system cannot boot because the boot loader configuration is corrupted. The start-up routines cannot, for example, translate physical drives to the actual locations in the Linux file system without a working boot loader.

To check the boot loader configuration and reinstall the boot loader, proceed as follows:

- 1 Perform the necessary steps to access the installed system as described in «[Accessing the Installed System](#)» (стр. 261).
- 2 Check whether the following files are correctly configured according to the GRUB configuration principles outlined in Глава 6, The Boot Loader GRUB (↑Содержание) and apply fixes if necessary.

- `/etc/grub.conf`
- `/boot/grub/device.map`
- `/boot/grub/menu.lst`
- `/etc/sysconfig/bootloader`

- 3 Reinstall the boot loader using the following command sequence:

```
grub --batch < /etc/grub.conf
```

- 4 Unmount the partitions, log out from the «change root» environment, and reboot the system:

```
umount -a
exit
reboot
```

## Fixing Kernel Installation

A kernel update may introduce a new bug which can impact the operation of your system. For example a driver for a piece of hardware in your system may be faulty, which prevents you from accessing and using it. In this case, revert to the last working kernel (if available on the system) or install the original kernel from the installation media.

---

### ПОДСКАЗКА: How to Keep Last Kernels after Update

To prevent failures to boot after a faulty kernel update, use the kernel multiversion feature and tell `libzypp` which kernels you want to keep after the update.

For example to always keep the last two kernels and the currently running one, add

```
multiversion.kernels = latest,latest-1,running
```

to the `/etc/zypp/zypp.conf` file.

---

A similar case is when you need to reinstall or update a broken driver for a device not supported by . For example when a hardware vendor uses a specific device, such as a hardware RAID controller, which needs a binary driver to be recognized by the operating system. The vendor typically releases a Driver Update Disk with the fixed or updated version of the required driver.

In both cases you need to access the installed system in the rescue mode and fix the kernel related problem, otherwise the system may fail to boot correctly:

- 1 Boot from the installation media.
- 2 If you are recovering after a faulty kernel update, skip this step. If you need to use a driver update disk (DUD), press [F6] to load the driver update after the boot menu appears, and choose the path or URL to the driver update and confirm with Yes.
- 3 Choose Rescue System from the boot menu and press [Enter]. If you chose to use DUD, you will be asked to specify where the driver update is stored.
- 4 Enter `root` at the `Rescue:` prompt. A password is not required.
- 5 Manually mount the target system and «change root» into the new environment. For more information, see «[Accessing the Installed System](#)» (стр. 261).
- 6 If using DUD, install/reinstall/update the faulty device driver package. Always make sure the installed kernel version exactly matches the version of the driver you are installing.

If fixing faulty kernel update installation, you can install the original kernel from the installation media with the following procedure.

- 6a Identify your DVD device with `hwinfo --cdrom` and mount it with `mount /dev/sr0 /mnt.`
- 6b Navigate to the directory where your kernel files are stored on the DVD, for example `cd /mnt/suse/x86_64/.`
- 6c Install required `kernel-*`, `kernel-*-base`, and `kernel-*-extra` packages of your flavor with the `rpm -i` command.
- 6d After the installation finishes, check that a new menu entry relevant for the newly installed kernel was added to the boot loader configuration file (`/boot/grub/menu.lst` for `grub`).
- 7 Update configuration files and reinitialize the boot loader if needed. For more information, see «[Modifying and Reinstalling the Boot Loader](#)» (стр. 261)
- 8 Remove any bootable media from the system drive and reboot.

## A.3 Правовая информация

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