Что происходит после включения ПК

01

Срабатывае т Basic Input/Output System (BIOS) 02

The Power-On-Sel f-Test (POST)

03

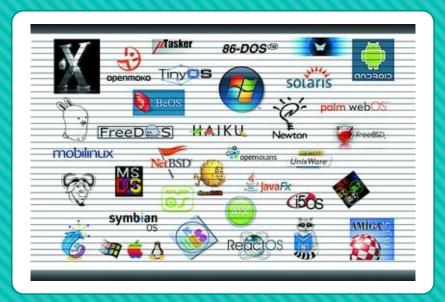
Чтение загрузочного сектора диска 04

Загрузка ОС

05

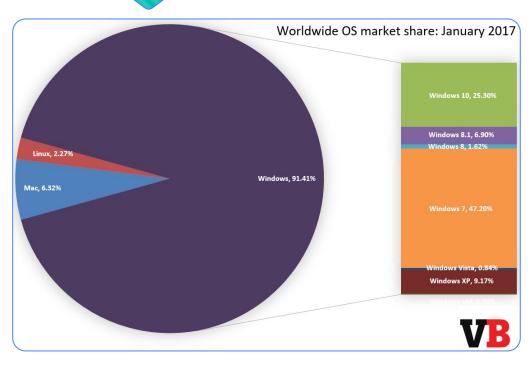
Запуск системных утилит, окружения

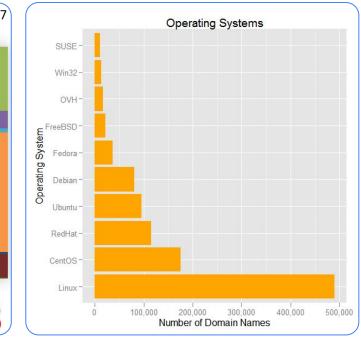




Операционная система

Распространенность ОС





GUI or CLI

GUI не всегда проще работы в командной строке CLI не всегда эффективнее

```
Java - JavadocClassInfoLoader, java - Eclipse SDK
File Edit Source Refactor Navigate Search Project Run Window Help
                       □ □ UDocFrame.java □ UDocApplet.java □ JavadocGassInfoLoader.java X □ JavadocGassProcessor.java
                                                      String modifiers = pType.substring(0, index);
                                                      String type = pType.substring(processIndex + "<& HREF=\"".length());

□ S

UDoc [udoc.cvs.sourceforge.net]

                                                      index = type.indexOf('\"');
                                                      String docPath = type.substring(0, index);
       ⊕ @ resources
                                                      int endTagIndex = type o subSequence(int beginIndex, int endIndex) CharSequenc...
                                                                                                                                   Returns a new string that is a substring of this string. The
          TDoc Ablam isr 1.1 (Sinani)
                                                      index = type.indexOf(" o substring(int beginindex) String-String
                                                                                                                                     substring begins at the specified beginIndex and extends
            UDoc/lib/asm-commons.jar 1.1 (Bir
                                                      // When the title is n
                                                                                                                                     the character at index endIndex - 1. Thus the length of
           LiDoc/lib/asm-util.jar 1.1 (Binary)
                                                                                                                                     he substring is endIndex-beginIndex
                                                         type = type.substrin
                                                                                                                                     hamburger".substring(4, 8) returns "urge"
                                                         if (type.startsWith(
                                                                                                                                                                                     orrolli
                                                                                                                                     'smiles".substring(1, 5) returns "mile
    12 Hierarchy 🖂
                                                           rune s rune subers
                                                            index = type.index
    JavadocClassProcessor, working set: Windo...
                                                            String endString
                                                                                                                                     beginIndex the beginning index, inclusive
     역 및 11 H -
                                                            boolean isknnotat:
                                                                                                                                     and Index the ending index, each give
                                                            if (isAnnotation)
                                                                                                                      Members calling ToadClassData(String, String)' - in workspace
                                                                                                                       of loadClassData(String, String) - chrris.udoc.mc Line Call
                                       ▶ □ □ UDoc [udoc.cvs.sourceforge.net]  ■ □ □ UDoc Build Script
                                                                                                                       Javado...cessor ♦ 1 19 19 19 19
                                                                                                                          ⊕ ⊚ load(boolean) - chrris.udoc.model
                                                                                          ⊟- <> manifest
        addTreeClass(String, DefaultMutableTreef
                                                                                              ( ) Main-Class
                                                 in dasspath 1.2 (ASCII -kkv)
                                                  .cvsignore 1.1 (ASCII-likv)
    RE Outline ⊠
                                                  project 1.1 (ASCII-kky)
                     B R X O X
                                                                                                                - B Javadoc 🖾
                                                                                                                                                  🚭 📟 🗖 📵 Declaration 🖾
      packageToDocumentationRootMap : Hash 0 errors, 8 warnings, 0 infos
                                                                                UDocFrame [Java Application] C:\jdk1.5.0_01\... java.lang.String.substring(...)
                                                                                                                                                            java.lang.String.substring(...)
                                                                                                                                                               public String substring(ir A
       S changeState(int. int. StringBuffer)
                                                                                                                      Returns a new string that is a substring
                                                                                                                                                            if (beginIndex < 0) (
       clearPackageDocumentationRootInformati
                                             A The method getDefaultRequestProper A <type name="chrris.udoc.moc A of this string. The substring begins at
                                                                                                                                                                 throw new StringIndexOut

a S destrouclassinfo(Classinfo)

                                                The method setDefaultRequestProper
                                                                                                                      the specified beginIndex and extends
       getPackageDocumentationRoot(String)
                                               The method getFontMetrics(Font) from
                                                                                                                                                            if (endIndex > count)
                                                                                                                      to the character at index endIndex -
       S getPackageNames()

    The method getFontMetrics(Font) from

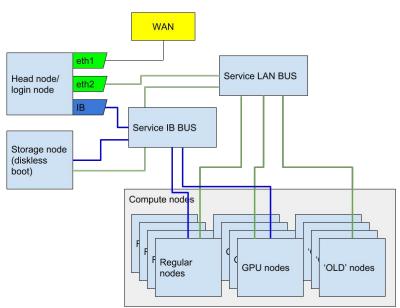
                                                                                                                      1. Thus the length of the substring is
                                                                                                                                                                 throw new StringIndexOut
      SloadClassData(String, String)
                                               h The method hide() from the type Com.
                                                                                                                      endIndex-beginIndex.
                                                                                                                                                            if (heginTndex > endIndex) (**
                                               A The method rechangeint int int int) (
                                                                                                            Smart Insert 323 : 33 32M of 37M
```

```
ost ~]# ping -q fa.wikipedia.org
packets transmitted, 1 received, 0% packet loss, time 0ms
t min/avg/max/mdev = 540.528/540.528/540.528/0.000 ms
wxr-xr-x. 11 root root 4096 Jul 31 22:26 cache
wxr-xr-x. 3 root root 4096 May 18 16:03 db
wxr-xr-x. 3 root root 4096 May 18 16:03 empty
wxr-xr-x. 2 root root 4096 May 18 16:03 games
wxrwx--T. 2 root gdm 4096 Jun 2 18:39 gdm
wxr-xr-x. 38 root root 4096 May 18 16:03 lib
wxr-xr-x. 2 root root 4096 May 18 16:03 local
wxrwxrwx. 1 root root 11 May 14 00:12 lock -> ../run/lock
wxrwxrwx, 1 root root 10 Jul 30 22:43 mail
wxr-xr-x. 2 root root 4096 May 18 16:03 nis
wxr-xr-x. 2 root root 4096 May 18 16:03 opt
wxr-xr-x. 2 root root 4096 May 18 16:03 preserve
wxr-xr-x. 2 root root 4096 Jul 1 22:11 report
rwxrwxrwt. 4 root root 4096 Sep 12 23:50
rwxr-xr-x. 2 root root 4096 May 18 16:03 yp
```

Рабочие станции, сервера, кластеры, системы хранения данных.

Специализированные компьютеры

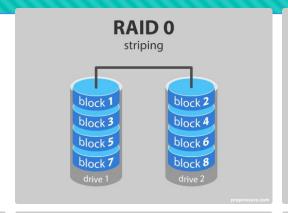


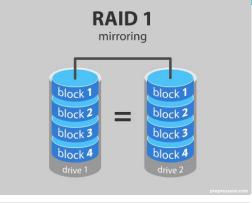


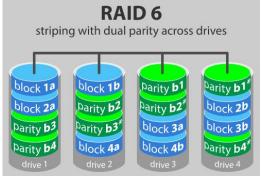
Системы хранения данных.

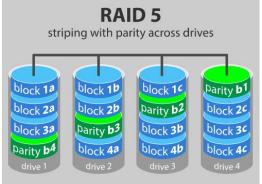
СХД - специализированный компьютер с большим хранилищем.

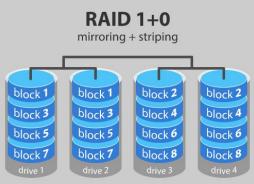
Основная задача - обеспечить надежность и доступность данных



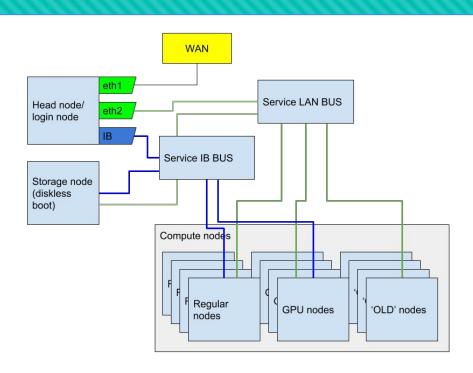








Вычислительный кластер. Newton

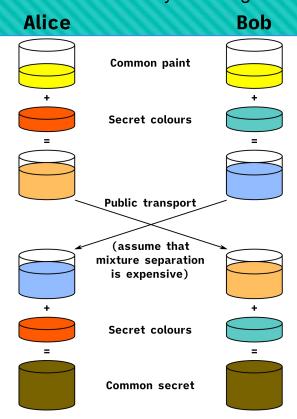


SSH. Криптоключи.

- Для доступа к компьютеру используют Secure SHell.
- Соединение всегда зашифровано.
- Linux и Mac содержат ssh клиент в дистрибутиве.
- Для windows Putty.
- SSH позволяет туннелировать трафик, передавать файлы

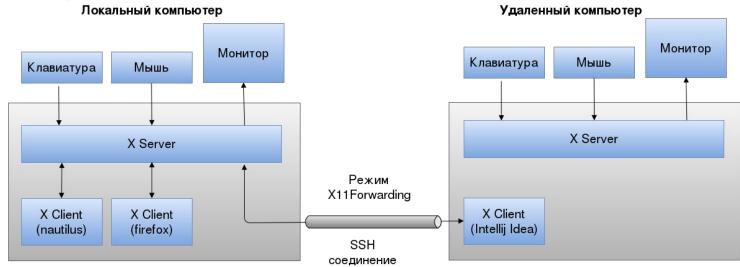
Symmetric Encryption Secret Key Secret Key A4\$h*L@9. T6=#/>B#1 R06/J2.>1L IPRL39P20 Plain Text Cipher Text Plain Text

Diffie-Hellman Key Exchange



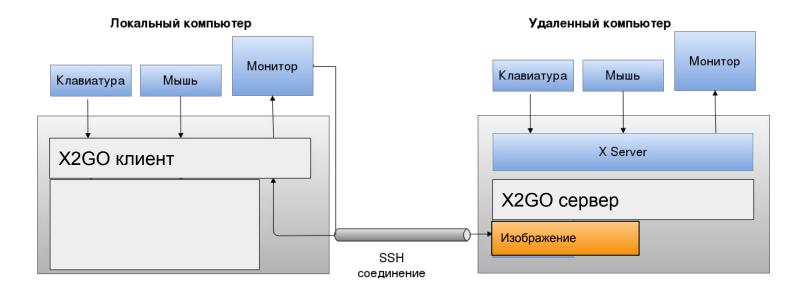
X11 forwarding, X2GO

- X Window System оконная система, обеспечивающая стандартные инструменты и протоколы для построения графического интерфейса пользователя. Используется в UNIX-подобных ОС (не всегда).
- X11Forwarding перенаправляет трафик удаленного X Client'а локальному X Server'у.
- Окно приложения отображается на локальном рабочем столе, пока вся логика выполняется на удаленном компьютере.



X11 forwarding, X2GO

• X2GO - решает проблемы совместимости



Основные команды BASH

Bash Variables (cont)

Set \$NAME to value

 PATH Executable search path

 HOME Home directory

Current shell

Bash Commands

uname -a. Show system and kernel
head -n1 /etc/issue Show distribution

mount Show mounted
filesystems

date Show system date

uptime Show uptime

whoami Show your username
man command Show manual for

command

Directory Operations

pwd Show current directory
mkdir dir Make directory dir
cd dir Change directory to dir
cd ... Go up a directory

List files

Is Options

-a Show all (including hidden)

-R Recursive list
-r Reverse order

-t Sort by last modified

S Sort by file size

Long listing format
 One file per line

m Comma-separated output

Q Quoted output

Bash Shortcuts

labo

CTRL-c Stop current command
CTRL-z Sleep program
CTRL-a Go to start of line
CTRL-e Go to end of line
CTRL-u Cut from start of line
CTRL-k Cut to end of line
CTRL-r Search history
!! Repeat last command

Run last command starting with

labc:p Print last command starting with abc

l\$ Last argument of previous command

abc

ALT-. Last argument of previous command

All arguments of previous command

^abc^123 Run previous command, replacing

Search Files

\$SHELL

Search for pattern in grep pattern files files grep -i Case insensitive search grep -r Recursive search grep -v Inverted search Show matched part of grep -o file only Find files starting with find /dir/ -name name* name in dir.

Command Lists

cmd1;cmd2

Run cmd1 then cmd2

cmd1 && cmd2

Run cmd2 if cmd1 is successful

cmd1 || cmd2

Run cmd2 if cmd1 is not successful

cmd &

Run cmd in a subshell

IO Redirection

cmd < file

Input of cmd from file

cmd1 <(cmd2)

Output of cmd2 as file input to cmd1

cmd > file

Standard output (stdout) of cmd to file

cmd > /dev/null

Discard stdout of cmd

cmd >> file
Append stdout to file

cmd 2> file

Error output (stderr) of cmd to file

Pipes

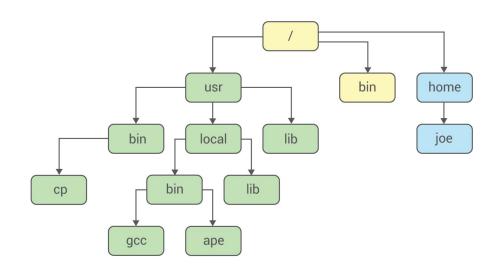
cmd1 | cmd2 | stdout of cmd1 to cmd2

cmd1 |& cmd2

stderr of cmd1 to cmd2

Файловая система

Рабочая директория - pwd директория выше - ../ текущая директория - ./ визуальный файловый менеджер - mc



Запуск программ в командной строке

- Запуск программ в командной строке: файл должен быть исполняемым (II, chmod)
- При запуске необходимо указывать ПУТЬ к файлу.
 - о либо полный путь /home/user/script.sh
 - о либо относительный ./script.sh
- Запуск Python-скриптов осуществляется через интерпретатор Python

Переменные среды

```
vivek@nas01:~$ printenv
TERM=xterm-256color
SHELL=/bin/bash
XDG SESSION COOKIE=9ee90112ba2cb349f07bfe2f00002e46-1381581541.324726-906214463
SSH CLIENT=192.168.1.6 60190 22
SSH TTY=/dev/pts/1
USER=vivek
MAIL=/var/mail/vivek
PATH=/usr/local/bin:/usr/bin:/usr/local/games:/usr/games
PWD=/home/vivek
LANG=en IN
SHLVL=1
HOME=/home/vivek
LANGUAGE=en IN:en
LOGNAME=vivek
SSH_CONNECTION=192.168.1.6 60190 192.168.1.10 22
=/usr/bin/printenv
vivek@nas01:~$
```

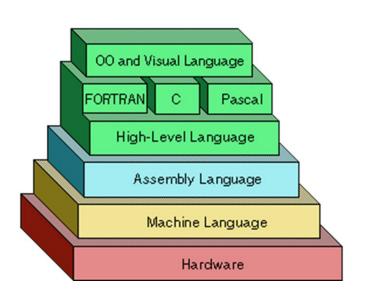
- РАТН путь к папкам с исполняемыми файлами
- LD_LIBRARY_PATH путь к библиотекам
- РҮТНОNРАТН путь к модулям
- ..

Использование модулей, команда module

- module avail
- module list
- module load
- module unload

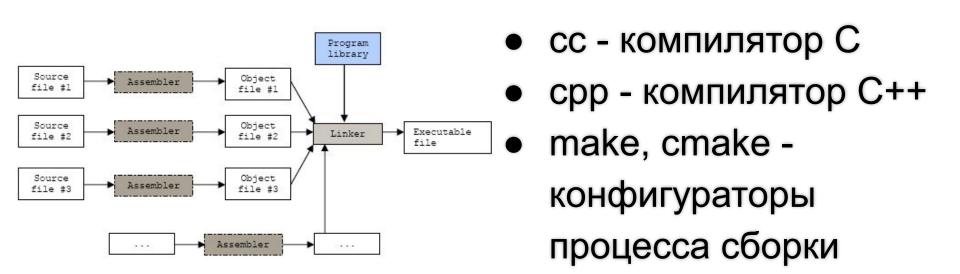
```
vivek@nas01:~$ printenv
TERM=xterm-256color
SHELL=/bin/bash
XDG SESSION COOKIE=9ee90112ba2cb349f07bfe2f00002e46-1381581541.324726-906214463
SSH CLIENT=192.168.1.6 60190 22
SSH TTY=/dev/pts/1
USER=vivek
MAIL=/var/mail/vivek
PATH=/usr/local/bin:/usr/bin:/usr/local/games:/usr/games
PWD=/home/vivek
LANG=en IN
SHLVL=1
HOME=/home/vivek
LANGUAGE=en IN:en
LOGNAME=vivek
SSH_CONNECTION=192.168.1.6 60190 192.168.1.10 22
=/usr/bin/printenv
vivek@nas01:~$
```

Компиляторы, компиляция простейших программ



- сс компилятор С
- срр компилятор С++
- make, cmake конфигураторы процесса сборки

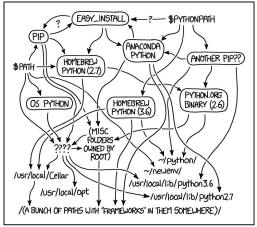
Компиляторы, компиляция простейших программ



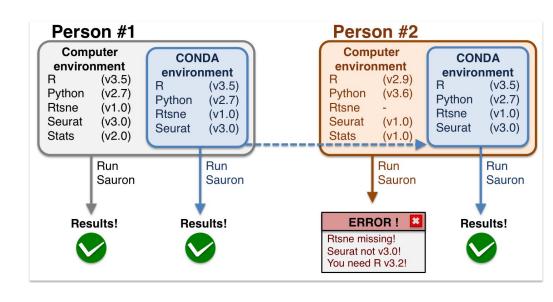
https://github.com/mittinatten/freesasa

Менеджер пакетов conda, pip

Менеджер пакетов позволяет устанавливать модули нужной версии и воспроизводить "окружения"



MY PYTHON ENVIRONMENT HAS BECOME. SO DEGRADED THAT MY LAPTOP HAS BEEN DECLARED A SUPERFUND SITE.



Менеджер пакетов conda, pip

Managing conda and anaconda	
conda info	Verify conda is installed, check version #
conda update conda	Update conda package and environment manager to current version
conda update anaconda	Update the anaconda meta package (the library of packages ready to install with conda command)
Managing environments	
conda infoenvs or conda info -e	Get a list of all my environments, active environment shown with *
conda create name snowflakes biopyt	thon Create an environment and install program(s)
or conda create -n snowflakes biopython	TIP: To avoid dependency conflicts, install all programs in the environment (snowflakes) at the same time.
	TIP: Environments install by default into the envs directory in your conda directory. You can specify a different path; see conda createhelp for details.
source activate snowflakes (Linux, OS X)	Activate the new environment to use it
activate snowflakes (Windows)	TIP: Activate prepends the path to the snowflakes environment.
conda create -n bunnies python=3.4 as	troid Create a new environment, specify Python version
conda create -n flowersclone snowi	Flakes Make exact copy of an environment
conda remove -n flowersall	Delete an environment
conda env export > puppies.yml conda env create -f puppies.yml	Save current environment to a file Load environment from a file

Managing Python	
conda searchfull-name python conda search -f python	Check versions of Python available to install
conda create -n snakes python=3.4	Install different version of Python in new environment
source activate snakes (Linux, OS X) activate snakes (Windows)	Switch to the new environment that has a different version of Python TIP: Activate prepends the path to the snakes environment.
Managing .condarc configuration	
conda configget	Get all keys and values from my .condarc file
conda configget channels	Get value of the key channels from .condarc file
conda configadd channels pandas	Add a new value to channels so conda looks for packages in this location

Git и GitHub.

Хранится история изменений файлов и их содержимого. Diff.





```
36 src/material-examples/dialog-overview/dialog-overview-example.ts
                                                                                                                                                                             View ~
... @@ -1,24 +1,46 @@
1 -import {Component} from '@angular/core';
                                                                                                 +import {Component, Inject} from '@angular/core';
2 -import {MdDialog} from '@angular/material';
                                                                                                  +import {MdDialog, MdDialogRef, MD_DIALOG_DATA} from '@angular/material';
      * @title Dialog Overview
                                                                                                   * @title Dialog Overview
        selector: 'dialog-overview-example',
                                                                                                    selector: 'dialog-overview-example',
9 - templateUrl: 'dialog-overview-example.html',
                                                                                                  + templateUrl: 'dialog-overview-example.html
     export class DialogOverviewExample {
                                                                                                  export class DialogOverviewExample {
                                                                                                 + animal: string;
                                                                                             14 + name: string:
        constructor(public dialog: MdDialog) {}
                                                                                                    constructor(public dialog: MdDialog) {}
14 - openDialog() {
                                                                                                 + openDialog(): void {
        this.dialog.open(DialogOverviewExampleDialog);
                                                                                                     let dialogRef = this.dialog.open(DialogOverviewExampleDialog,
```

