



UNIUNEA EUROPEANĂ



GUVERNUL ROMÂNIEI



Instrumente Structurale
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Platformă de e-learning și curriculum e-content
pentru învățământul superior tehnic

Utilizarea Sistemelor de Operare

22. Analiza hardware a sistemului



Comenzi utile Linux

```
razvan@anaconda:~$ lspci
00:02.0 VGA compatible controller: Intel Corporation 82845G/GL[Brookdale-G]/GE
Chipset ...
00:1d.0 USB Controller: Intel Corporation 82801DB/DBL/DBM (ICH4/ICH4-L/ICH4-M)
USB UHCI ...
00:1f.1 IDE interface: Intel Corporation 82801DB (ICH4) IDE Controller (rev
01)
00:1f.5 Multimedia audio controller: Intel Corporation 82801DB/DBL/DBM
(ICH4/ICH4-L/ICH4-M) AC'97 ...
01:08.0 Ethernet controller: Intel Corporation 82801DB PRO/100 VE (LOM)
Ethernet Controller (rev 81)
```

```
anaconda:/home/razvan# lshw -class bus
```

```
*-core
  description: Motherboard
  product: D845GRG
  vendor: Intel Corporation
  physical id: 0
  version: AAA84534-301
  serial: IURG22905363
*-usb:0
*-ide:0
*-ide:1
```



Analiza microprocesorului în Linux

- arhitecturi

```
razvan@ragnarok:~$ ls /usr/src/linux-2.6.16.31/arch/  
alpha  cris  i386  m68k      parisc  s390  sparc  v850  
arm    frv   ia64  m68knommu powerpc sh    sparc64  
x86_64  
arm26  h8300 m32r  mips      ppc     sh64  um  
xtensa
```

- 4 biți – Intel 4004
- 8 biți – Intel 8008, 8080, Zilog Z80, Motorola 6800
- 16 biți – DEC PDP 11, Intel 8086 (primul din seria x86), 80186, 80286
- 32 biți – Motorola 68000, 68010, 68020, x86 (80486, Pentium (2, 3, 4), Celeron, Xeon, K6 (2,3), Athlon, Duron)
- 64 biți – x86_64 (AMD64, EM64T)

Analiza microprocesorului (2)

```
anaconda:/home/razvan# cat /proc/cpuinfo
```

```
processor          : 0
vendor_id         : GenuineIntel
cpu family        : 15
model             : 1
model name        : Intel(R) Pentium(R) 4 CPU 1.70GHz
stepping          : 2
cpu MHz           : 1699.922
cache size        : 256 KB
[...]
```

```
anaconda:/home/razvan# lshw -class cpu
```

```
*-cpu
```

```
description: CPU
product: Intel(R) Pentium(R) 4 CPU 1.70GHz
vendor: Intel Corp.
[...]
size: 1700MHz
capacity: 3060MHz
width: 32 bits
clock: 100MHz
```



Analiza memoriei

```
anaconda:/home/razvan# lshw -class memory
*-firmware
  description: BIOS
  vendor: Intel Corp.
  size: 64KB
  [...]
*-cache:0
  description: L1 cache
  size: 8KB
  capacity: 8KB
  capabilities: pipeline-burst internal varies data
  [...]
*-memory
  description: System Memory
  size: 256MB
  capacity: 3GB
*-bank:0
  description: DIMM DDR Synchronous 266 MHz (3.8 ns)
  size: 256MB
  width: 64 bits
  clock: 266MHz (3.8ns)
*-bank:1
  description: DIMM DDR Synchronous 266 MHz (3.8 ns) [empty]
  [...]
```

Analiza memoriei (2)

```
anaconda:/home/razvan# cat /proc/meminfo
```

```
MemTotal:      255248 kB  
MemFree:       23000 kB  
Buffers:       10576 kB  
Cached:        50640 kB
```

```
[...]
```

```
anaconda:/home/razvan# free
```

	total	used	free	shared	buffers	cached
Mem:	255248	232288	22960	0	10584	50692
-/+ buffers/cache:		171012	84236			
Swap:	763048	218940	544108			

```
anaconda:/home/razvan# free -m
```

	total	used	free	shared	buffers	cached
Mem:	249	227	22	0	10	49
-/+ buffers/cache:		167	81			
Swap:	745	213	531			

Discuri în Linux

- Pot fi accesate din /dev
 - Dispozitive de tip bloc (fișiere speciale)

```
anaconda:/home/razvan# ls -l /dev/hda*
```

```
brw-rw---- 1 root disk 3, 0 Oct 17 13:08 /dev/hda  
brw-rw---- 1 root disk 3, 1 Oct 17 13:08 /dev/hda1  
brw-rw---- 1 root disk 3, 2 Oct 17 13:08 /dev/hda2  
brw-rw---- 1 root disk 3, 5 Oct 17 13:08 /dev/hda5
```

```
anaconda:/home/razvan# fdisk -l
```

```
[...]
```

Device	Boot	Start	End	Blocks	Id	System
/dev/hda1	*	1	4770	38314993+	83	Linux
/dev/hda2		4771	4865	763087+	5	Extended
/dev/hda5		4771	4865	763056	82	Linux swap / Solaris

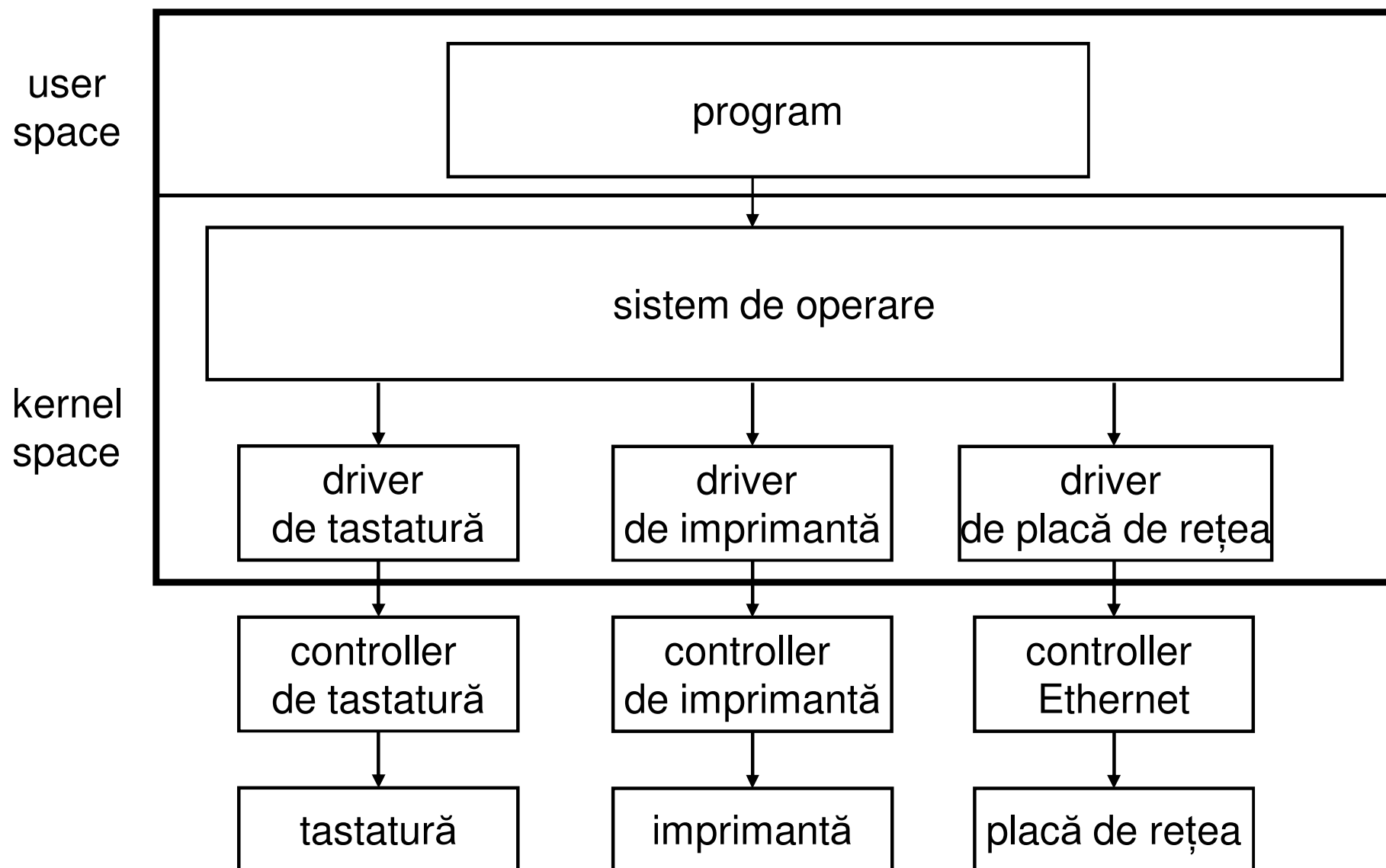
- Folosite în operații de montare

```
# mount /dev/hda4 /mnt/disk
```

Discuri în Linux (2)

```
anaconda:/home/razvan# lshw -class disk
*-disk
  description: ATA Disk
  product: WDC WD400EB-00CPF0
  vendor: Western Digital
  size: 37GB
  capacity: 37GB
*-volume:0
  description: Linux filesystem partition
  logical name: /dev/hda1
  capacity: 36GB
  capabilities: primary bootable
*-volume:1
  description: Extended partition
  logical name: /dev/hda2
*-logicalvolume
  description: Linux swap / Solaris partition
  logical name: /dev/hda5
*-cdrom
  description: IDE CD-ROM
  product: SONY CD-ROM CDU523 1
  physical id: 0
  bus info: ide@1.0
  logical name: /dev/hdc
```


Programarea dispozitivelor periferice



Dispozitive speciale

■ /dev/zero, /dev/null

```
razvan@anaconda:~/junk/uso$ dd if=/dev/zero of=data.out bs=512 count=1
1+0 records in
1+0 records out
512 bytes (512 B) copied, 0.0148722 seconds, 34.4 kB/s
razvan@anaconda:~/junk/uso$ ls -l data.out
-rw-r--r-- 1 razvan razvan 512 Oct 19 17:36 data.out
razvan@anaconda:~/junk/uso$ hexdump -C data.out
00000000  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
|.....|
*
00000200
razvan@anaconda:~/junk/uso$ cat /dev/null > data.out
razvan@anaconda:~/junk/uso$ ls -l data.out
-rw-r--r-- 1 razvan razvan 0 Oct 19 17:36 data.out
```

Dispozitive speciale (2)

- `/dev/urandom`, `/dev/full`, `/dev/stdout`

```
razvan@anaconda:~/junk/uso$ dd if=/dev/urandom of=data.out bs=512 count=1
1+0 records in
1+0 records out
512 bytes (512 B) copied, 0.000476038 seconds, 1.1 MB/s
razvan@anaconda:~/junk/uso$ hexdump -C data.out
00000000  81 c2 92 4b ac 12 36 a6  66 60 89 c3 91 eb fa d3
...K..6.f`.....|
00000010  31 c0 0c 92 d3 c1 ff 6d  28 13 94 c1 76 9e 92 4d
1.....m(...v..M|
[...]
razvan@anaconda:~/junk/uso$ cp data.out /dev/full
cp: writing `/dev/full': No space left on device
razvan@anaconda:~/junk/uso$ echo "a" > /dev/full
-bash: echo: write error: No space left on device
razvan@anaconda:~/junk/uso$ echo "a" > /dev/stdout
a
```