Лекция 15
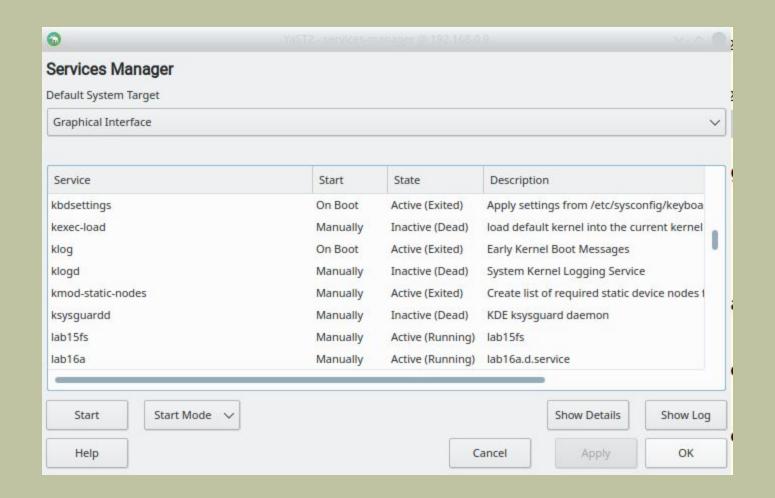
- Службы Linux (daemons):
  - SysV;
  - systemd.

```
systemd-+-ModemManager---2*[{ModemManager}]
        |-NetworkManager---2*[{NetworkManager}]
        |-agent---2*[{agent}]
        |-agetty
        |-akonadi_control-+-akonadi_akonote---3*[{akonadi_akonote}]
                          |-akonadi_archive---4*[{akonadi_archive}]
........................................................................
        |-cron
        |-cupsd
        |-dbus-daemon
        |-firewalld---{firewalld}
........................................................................
        |-kdeinit5-+-dolphin-+-bash
        |          |         |-okular---2*[{okular}]
        |          |         `-3*[{dolphin}]
        |          |-dolphin-+-bash
        |          |         `-3*[{dolphin}]
........................................................................
        |          |-konsole-+-bash-+-bash
        |          |         |      `-pstree
        |          |         |-2*[bash]
        |          |         `-2*[{konsole}]
```

Services Manager

Default System Target

Graphical Interface ⌄

Service	Start	State	Description
kbdsettings	On Boot	Active (Exited)	Apply settings from /etc/sysconfig/keyboa
kexec-load	Manually	Inactive (Dead)	load default kernel into the current kernel
klog	On Boot	Active (Exited)	Early Kernel Boot Messages
klogd	Manually	Inactive (Dead)	System Kernel Logging Service
kmod-static-nodes	Manually	Active (Exited)	Create list of required static device nodes f
ksysguardd	Manually	Inactive (Dead)	KDE ksysguard daemon
lab15fs	Manually	Active (Running)	lab15fs
lab16a	Manually	Active (Running)	lab16a.d.service

Start   Start Mode ⌄   Show Details   Show Log

Help   Cancel   Apply   OK

```
> systemctl  -a  list-units | grep lab1
 lab15fs.service                loaded   active   running   lab15fs
 lab16a.d.service               loaded   active   running   lab16a.d.service
```

Службы SysV

```c
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>

int main(int argc, char *argv[]){
 pid_t pid, sid;

 pid = fork();
 if (pid < 0) { exit(EXIT_FAILURE); }
 if (pid > 0) { exit(EXIT_SUCCESS); } //Закрываем родительский процесс

 sid = setsid();
 if (sid < 0) { exit(EXIT_FAILURE); }
 if ((chdir("/")) < 0) { exit(EXIT_FAILURE); }

 printf("It's all right\n");

 close(STDIN_FILENO);
 close(STDOUT_FILENO);
 close(STDERR_FILENO);
```

```
{
  FILE* fp;
  int counter=0;
  while(1){
    fp=fopen("/home/malkov/test_daemon.txt", "a+");
    fprintf(fp,"%d\n", counter++);
    sleep(10);
    fclose(fp);
  }
}
```

```
~> ls -l   /sbin  | less
lrwxrwxrwx 1 root root       16 Oct 26  2021 agetty -> /usr/sbin/agetty
………………………………………………………………………………………..
-rwxr-xr-x 1 root root    11904 Dec 20  2022 lab16a
-rwxr-xr-x 1 root root   851928 Dec  2  2021 ldconfig
lrwxrwxrwx 1 root root       17 Apr 21  2021 logsave -> /usr/sbin/logsave
lrwxrwxrwx 1 root root       17 Oct 26  2021 losetup -> /usr/sbin/losetup
lrwxrwxrwx 1 root root       13 Oct 15  2021 lsmod -> /usr/bin/kmod
```

```
~>ls -l  /etc/init.d
drwxr-xr-x 1 root root     0 Sep  1  2021 boot.d
-rwxrwxrwx 1 root root   459 Dec 20  2022 lab16a.d
……………………………………………………………………
```

```bash
#!/bin/bash

LAB16A_BIN=/usr/sbin/lab16a

. /etc/rc.status
rc_reset

case "$1" in
start)
echo -n "Starting service LAB16A daemon"
startproc $LAB16A_BIN
rc_status -v
;;
stop)
echo -n "Shutting down service LAB16A daemon"
killproc -TERM $LAB16A_BIN
rc_status;;
```

```
restart)
$0 stop
$0 start
-v
rc_status
;;
status)
echo -n "Checking for LAB16A daemon: "
checkproc $LAB16A_BIN
rc_status -v
;;
*)
echo "Usage: $0 {start|stop|status|restart}"
exit 1
;;
esac
rc_exit
```

```
/Lecture15/labs> sudo /etc/init.d/lab16a.d start
redirecting to systemctl start lab16a.d.service
```

```
/Lecture15/labs> sudo /etc/init.d/lab16a.d status
Checking for LAB16A daemon:                          running
● lab16a.d.service
  Loaded: loaded (/etc/init.d/lab16a.d; generated; vendor p
  Active: active (running) since Fri 2023-12-08 14:16:06 +0
    Docs: man:systemd-sysv-generator(8)
 Process: 10978 ExecStart=/etc/init.d/lab16a.d start (code=
   Tasks: 1
  CGroup: /system.slice/lab16a.d.service
          └─10986 /usr/sbin/lab16a
```

```
/Lecture15/labs> sudo /etc/init.d/lab16a.d stop
redirecting to systemctl stop lab16a.d.service
```

```
Lecture15/labs> sudo /etc/init.d/lab16a.d status
Checking for LAB16A daemon:                          unused
● lab16a.d.service
  Loaded: loaded (/etc/init.d/lab16a.d; generated; vendor pr
  Active: inactive (dead)
    Docs: man:systemd-sysv-generator(8)
```

/Lecture15/labs> ls -l ~/test_daemon.txt
-rw-r--r-- 1 root root 7134 Dec 8 14:25 /home/malkov/test_daemon.txt

Lecture15/labs> vim ~/test_daemon.txt
…
1612
0
1
…
54

```c
#include <sys/types.h>
#include <stdio.h>
#include <unistd.h>
#include <string.h>
#include <sys/socket.h>
#include <netdb.h>
#include <netinet/in.h>
#include <arpa/inet.h>

#define BUF_SIZE 500
#define MY_PORT  1952

int main(){
  int   loc_socket_fd, cln_socket_fd;
  struct sockaddr_in   local_addr, client_addr;
  int client_addr_size=sizeof(client_addr);
```

lab14f-s.c

Сокет-сервер

```
loc_socket_fd=socket(AF_INET, SOCK_STREAM, 0);

 local_addr.sin_family=AF_INET;
 local_addr.sin_port=htons(MY_PORT);
 local_addr.sin_addr.s_addr=0;

 bind(loc_socket_fd, (struct sockaddr*)&local_addr,
     sizeof(local_addr) );

 listen(loc_socket_fd, 0x100);
```

```c
  while((cln_socket_fd=
    accept(loc_socket_fd, (struct sockaddr *) &client_addr, &client_addr_size))
   )
{

    struct hostent *hst;
    int bytes_read;
    hst=gethostbyaddr(
      (char*)&client_addr.sin_addr.s_addr,4, AF_INET);

    printf("%s [%s] new connect!\n",
    (hst)?hst->h_name:"", inet_ntoa(client_addr.sin_addr));

    send(cln_socket_fd, "Hello a new client!\n",
      sizeof("Hello a new client!\n"),0);
  }

  return 0;
}
```

```
/labs/srvcln> ./lab14f-s
localhost [127.0.0.1] new connect!
```

```
/labs> telnet
telnet> open 127.0.0.1 1952
Trying 127.0.0.1...
Connected to 127.0.0.1.
Escape character is '^]'.
Hello a new client!
Connection closed by foreign host.
```

```c
#include <sys/socket.h>
#include <netinet/in.h>
#include <arpa/inet.h>
#include <netdb.h>
#include <unistd.h>
#include <string.h>
#include <stdio.h>

#define SERVERADD "127.0.0.1"

int main(){
 int socket_fd;
 struct sockaddr_in name;
 char buff[1024];
 char buffer[10000];
 size_t num_char;
 struct hostent* host;
```

lab14f-c.c

Сокет-клиент

```c
socket_fd=socket(PF_INET, SOCK_STREAM, 0);

name.sin_family=AF_INET;
host=gethostbyname(SERVERADD);
if(host==0)
  return -1;
else
  name.sin_addr=*((struct in_addr *)host->h_addr);

name.sin_port=htons(1952);

if(connect(socket_fd,(struct sockaddr*)&name,sizeof(struct
                                        sockaddr_in))==-1){
  perror("connect");
  return -1;
}
```

```
while(1){
    num_char=read(socket_fd, buffer, 10000);
    if(num_char==0){
    return 1;
    }
    fwrite(buffer,sizeof(char),num_char,stdout);
}
return 0;
}
```

```
labs/srvcln> ./lab14f-s
localhost [127.0.0.1] new connect!
```

```
labs/srvcln> ./lab14f-c
Hello a new client!
```

```
FILE* fp;

...................................................................
fp=fopen("/home/malkov/service_test.txt","a+");
fprintf(fp, "%s [%s] new connect!\n",
    (hst)?hst->h_name:"",
    inet_ntoa(client_addr.sin_addr));
fclose(fp);
```

Службы systemd

UNITS

```
> cat /etc/systemd/system/lab15fs.service
[Unit]
Description=lab15fs

[Service]
ExecStart=/usr/sbin/lab15f-s

[Install]
WantedBy=multi-user.target
```

```
> sudo systemctl start  lab15fs
```

```
> sudo systemctl status
lab15fs
● lab15fs.service - lab15fs
  Loaded: loaded (/etc/systemd/system/lab15fs.service;
disabled; vendor preset: disabled)
  Active: active (running) since Wed 2022-12-21 11:30:13
+07; 10s ago
Main PID: 11417 (lab15f-s)
   Tasks: 1
  CGroup: /system.slice/lab15fs.service
          └─11417 /usr/sbin/lab15f-s


Dec 21 11:30:13 192.168.0.6 systemd[1]: Started lab15fs.
```

```
/labs> telnet
telnet> open 127.0.0.1 1952
Trying 127.0.0.1...
Connected to 127.0.0.1.
Escape character is '^]'.
Hello a new client!
Connection closed by foreign host.
```

```
…/labs> ./lab15f-c
Hello a new client!
```

Mobile Telnet

Connecting to 90.189.165.133 port 1952, please wait...
Hello a new client!

```
~> cat ~/service_test.txt

localhost [127.0.0.1] new connect!
localhost [127.0.0.1] new connect!
localhost [127.0.0.1] new connect!
 [90.189.165.133] new connect!
 [90.189.165.133] new connect!
ppp85-140-160-59.pppoe.mtu-net.ru [85.140.160.59] new connect!
ppp85-140-160-59.pppoe.mtu-net.ru [85.140.160.59] new connect!
```

```
> sudo systemctl stop  lab15fs
```

```
> sudo systemctl status lab15fs
● lab15fs.service - lab15fs
  Loaded: loaded (/etc/systemd/system/lab15fs.service;
                      disabled; vendor preset: disabled)
  Active: inactive (dead)

Dec 21 11:30:13 192.168.0.6 systemd[1]: Started lab15fs.
Dec 21 11:54:11 192.168.0.6 systemd[1]: Stopping
lab15fs...
Dec 21 11:54:11 192.168.0.6 systemd[1]: Stopped lab15fs.
```