

## Курс «Анализ, оптимизация и аварийные работы в Linux»

### Методические указания по выполнению работы. Часть 3.

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#### Задача:

1. Используя команду **eix**, найти и собрать недостающие пакеты: **NetworkManager**, **Dolphin**.
2. Решить проблему с драйвером **qxl** для запуска в VM **qemu/kvm**.
3. Показать скриншот запущенной системы входа **sddm**.
4. Показать скриншот вывода команды **uname -a** в консоле запущенного **Display Manager**, например **KDE**.

#### 1. Поиск и решение проблем.

Запускаем VM. Заходим в консоль, авторизуемся.

```
This is localhost.unknown_domain (Linux x86_64 5.15.75-gentoo-x86_64) 21:08:36
localhost login: tech
Password:
Last login: Wed Dec  7 17:54:38 -00 2022 on pts/0
tech@localhost ~$ sudo su -

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

#1) Respect the privacy of others.
#2) Think before you type.
#3) With great power comes great responsibility.

Password:
```

Проверяем IP нашей VM:

```
localhost ~ # ifconfig
```

```
localhost ~ # ifconfig
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

Видим, что ip не назначен, исправляем это:

```
localhost ~ # ifconfig -a
localhost ~ # ifconfig enp3s0 10.100.10.23/26
localhost ~ # route add default gw 10.100.10.1
localhost ~ # ping ya.ru
```

```
localhost ~ # ifconfig -a
enp3s0: flags=4098<BROADCAST,MULTICAST> mtu 1500
    ether 52:54:00:85:9c:66 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

localhost ~ # ifconfig enp3s0 10.100.10.23/26
localhost ~ # route add default gw 10.100.10.1
localhost ~ # ping ya.ru
PING ya.ru (87.250.250.242) 56(84) bytes of data.
64 bytes from ya.ru (87.250.250.242): icmp_seq=1 ttl=246 time=34.1 ms
64 bytes from ya.ru (87.250.250.242): icmp_seq=2 ttl=246 time=34.2 ms
64 bytes from ya.ru (87.250.250.242): icmp_seq=3 ttl=246 time=34.0 ms
^C
--- ya.ru ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 34.046/34.141/34.242/0.080 ms
localhost ~ #
```

Проверим, запущена ли служба **SSH**:

```
localhost ~ # ps -aux | grep ssh
```

```
localhost ~ # ps -aux | grep ssh
root      1007  0.0  0.1  6852  5404 ?        Ss   Dec08   0:00 sshd: /usr/sbin/sshd -D -e [listener]
0 of 10-100 startups
root      2129  0.0  0.1  9604  7724 ?        Ss   Dec12   0:00 sshd: tech [priv]
tech     2132  0.0  0.1  9604  4976 ?        S    Dec12   0:00 sshd: tech@pts/1
root     19875  0.0  0.0 221932 1956 pts/1    S+   20:20   0:00 grep --colour=auto ssh
localhost ~ #
```

Служба ssh запущена, можно подключиться к VM с хост машины:

```
user@host:~$ ssh -l tech 10.100.10.23
```

Далее попробуем запустить **Xorg** - сервер оконной системы X Window server:

```
localhost ~ # X
```

```
localhost ~ # X
X.Org X Server 1.21.1.4
X Protocol Version 11, Revision 0
Current Operating System: Linux localhost 5.15.75-gentoo-x86_64 #1 SMP Tue Dec 6 15:53:46 -00 2022 x86_64
Kernel command line: BOOT_IMAGE=/boot/vmlinuz-5.15.75-gentoo-x86_64 root=UUID=1484fdd8-4f65-4dbd-8b4d-810db8f037e2 ro init=/lib/systemd/systemd

Current version of pixman: 0.40.0
  Before reporting problems, check http://wiki.x.org
  to make sure that you have the latest version.
Markers: (--) probed, (**) from config file, (==) default setting,
  (++) from command line, (!!) notice, (II) informational,
  (WW) warning, (EE) error, (NI) not implemented, (??) unknown.
(==) Log file: "/var/log/Xorg.0.log", Time: Mon Dec 12 21:25:16 2022
(==) Using system config directory "/usr/share/X11/xorg.conf.d"
resizing surface0 to 16777216
memory space from 0x7f10810dd000 to 0x7f10840da000
memory space from 0x7f107c0dd000 to 0x7f10800dd000
(EE)
```

```
(EE) Backtrace:
(EE) 0: X (xorg_backtrace+0x5b) [0x55c754e096fb]
(EE) 1: X (0x55c754ccf000+0x13e3a5) [0x55c754e0d3a5]
(EE) 2: /lib64/libc.so.6 (0x7f10848b1000+0x37c70) [0x7f10848e8c70]
(EE) 3: X (xf86InitViewport+0x49) [0x55c754e246b9]
(EE) 4: X (InitOutput+0xb44) [0x55c754e2a734]
(EE) 5: X (0x55c754ccf000+0x76774) [0x55c754d45774]
(EE) 6: /lib64/libc.so.6 (0x7f10848b1000+0x2320a) [0x7f10848d420a]
(EE) 7: /lib64/libc.so.6 (__libc_start_main+0x7c) [0x7f10848d42bc]
(EE) 8: X (_start+0x21) [0x55c754d09ab1]
(EE)
(EE) Segmentation fault at address 0x24
(EE)
Fatal server error:
(EE) Caught signal 11 (Segmentation fault). Server aborting
(EE)
(EE)
Please consult the The X.Org Foundation support
  at http://wiki.x.org
  for help.
(EE) Please also check the log file at "/var/log/Xorg.0.log" for additional information.
(EE)
(EE) Server terminated with error (1). Closing log file.
Aborted (core dumped)
localhost ~ # █
```

И получаем ошибку: **Segmentation fault at address 0x24.**

Копируем текст ошибки и идем искать в Интернет.

The screenshot shows a Google search page with the following content:

- Search bar: gentoo qxl Segmentation fault at address 0x24
- Navigation: Все, Картинки, Новости, Видео, Покупки, Ещё, Инструменты
- Results:
  - Result 1: <https://forums.gentoo.org> > vi... [View topic - Xorg server upgraded and now X keeps crashing](#)  
8 мар. 2022 г. — I've upgraded my **gentoo** VM as usual and got several updates including one for Xorg. The version of Xorg is: X.Org X Server 1.21.1.3 according to ...  
5 сообщений · can help[code]. My personal space. My delta-labs.org snippets do expire ...
  - Result 2: <https://bugs.gentoo.org> > ... [860267 – >=x11-base/xorg-server-1.20.14-r1 - Gentoo's Bugzilla](#)  
19 сент. 2022 г. — I use X inside of a qemu system on **gentoo** linux. ... [ 567.127] (EE)  
**Segmentation fault at address 0x24** The last working release is 1.20.14-r1 ...
  - Result 3: <https://bugs.gentoo.org> > ... [app-emulation/spice with >=x11-drivers/xf86-video-qxl-0.1.1](#)  
14 авг. 2015 г. — 4 Since the stabilization of x11-drivers/xf86-video-qxl 0.1.1, Xspice **segfault** at startup because it use the new API to add memslot. Step to ...
  - Result 4: <https://www.reddit.com> > insta... [Installing xf86-video-qxl stops x11 from working : r/Gentoo](#)  
19 авг. 2022 г. — I am currently considering to daily drive **Gentoo** for a while, ... closing the dead SDDM session) I get a **Segmentation fault at address 0x24**.

Переходим по второй ссылке: <http://bugs.gentoo.org>

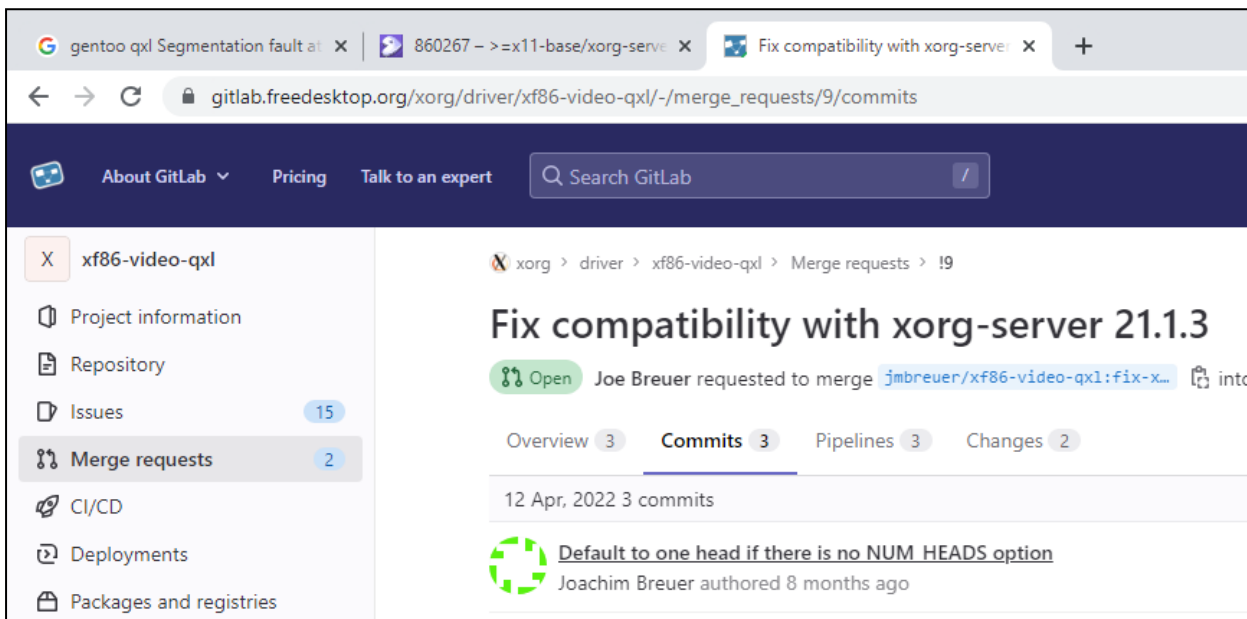
Находим следующий комментарий:

The screenshot shows a comment on the Gentoo bugzilla page with the following content:

- Author: Sam James (status: AT, Infra, Dev, Sec)
- Date: 2022-09-17 18:22:28 UTC
- Comment ID: Comment 12
- Text:
 

```
(In reply to Klaus Ethgen from comment #11)
> Could you show me that patch?
> https://gitlab.freedesktop.org/xorg/driver/xf86-video-qxl/-/merge_requests/9
> doesn't show anything useful.

https://gitlab.freedesktop.org/xorg/driver/xf86-video-qxl/-/merge_requests/9.patch
```



И код, который необходимо будет внести в файл `src/qxl_driver.c`:

```

src/qxl_driver.c
@@ -1005,6 +1005,10 @@ qxl_pre_init_common(ScreenInfoPtr pScreen)
1005 1005     get_bool_option (qxl->options, OPTION_DEBUG_RENDER_FALLBACKS, "QXL_DEBUG_RENDER_FALLBACKS");
1006 1006     qxl->num_heads =
1007 1007     get_int_option (qxl->options, OPTION_NUM_HEADS, "QXL_NUM_HEADS");
1008 +     if (qxl->num_heads == 0) {
1009 +         xf86DrvMsg (scrnIndex, X_INFO, "QXL_NUM_HEADS not configured, defaulting to 1\n");
1010 +         qxl->num_heads = 1;
1011 +     }
1008 1012
1009 1013     qxl->deferred_fps = get_int_option(qxl->options, OPTION_SPLICE_DEFERRED_FPS, "XSPLICE_DEFERRED_FPS");
1010 1014     if (qxl->deferred_fps > 0)
    
```

Далее приступаем к внесению изменений в драйвер `qxl`:

```
localhost ~ # ebuild /var/db/repos/gentoo/x11-drivers/xf86-video-qxl/xf86-video-qxl-0.1.5_p20200205-r1.ebuild configure
```

```

xf86-video-qxl 0.1.5
=====

prefix:                /usr
c compiler:             x86_64-pc-linux-gnu-gcc

drm:
KMS:                   no
Build qxl:              yes
Build xspice:           no
Build spiceccid:        no

>>> Source configured.
localhost ~ #
    
```

Далее запускаем **MC** (Midnight Commander) и переходим в директорию: `/var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work/src`

```

Left      File      Command  Options  Right
<-- ~ --> <-- ~ -->
.n        Name      Size     Modify   time    .n        Name      Size     Modify   time
/..       UP--DIR  Dec 7 21:08 /..       UP--DIR  Dec 13 21:52
/.cache   4096     Dec 6 20:52 /spiceccid 4096     Dec 13 21:52
/.config  4096     Dec 7 19:21 /uxa        4096     Dec 13 21:52
/.local   4096     Dec 6 20:52 Makefile    69631    Dec 13 21:52
.bash_history 2532    Dec 13 20:24 Makefile.am 3440     Feb 13 2021
.keep     0        Nov 27 21:08 Makefile.in 75071    Dec 13 21:52
.keep_acct-user_root-0 0        Nov 28 21:24 compat-api.h 3515     Feb 13 2021
.viminfo   9489    Dec 7 18:18 dfps.c     11782    Feb 13 2021
          2532    Dec 13 20:24 dfps.h     1276     Feb 13 2021
          0        Nov 27 21:08 mspace.c   83600    Feb 13 2021
          0        Nov 28 21:24 mspace.h   4882     Feb 13 2021
          9489    Dec 7 18:18 murmurhash3.c 7988     Feb 13 2021
          0        Nov 28 21:24 murmurhash3.h 1149     Feb 13 2021
          9489    Dec 7 18:18 qxl.h      19413    Feb 13 2021
          9489    Dec 7 18:18 qxl_cursor.c 5973     Feb 13 2021
          9489    Dec 7 18:18 qxl_driver.c 43575    Feb 13 2021
          9489    Dec 7 18:18 qxl_drvmode.c 17618    Feb 13 2021
          9489    Dec 7 18:18 qxl_drvmode.h 2911     Dec 13 21:52
          9489    Dec 7 18:18 qxl_image.c 6813     Feb 13 2021

UP--DIR                                     qxl_driver.c
12G/43G (28%)                               12G/43G (28%)
Hint: You can browse RPM files by tapping enter on top of an rpm file.
localhost /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work/src #
1Help 2Menu 3View 4Edit 5Copy 6RenMov 7kdir 8Delete 9PullDn 10Quit

```

Сделаем копию данного файла:

```
localhost /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work/src # cp qxl_driver.c qxl_driver.c.orig
```

```

Left      File      Command  Options  Right
<-- ~ --> <-- ~ -->
.n        Name      Size     Modify   time    .n        Name      Size     Modify   time
/..       UP--DIR  Dec 7 21:08 /..       UP--DIR  Dec 13 21:52
/.cache   4096     Dec 6 20:52 /spiceccid 4096     Dec 13 21:52
/.config  4096     Dec 7 19:21 /uxa        4096     Dec 13 21:52
/.local   4096     Dec 6 20:52 Makefile    69631    Dec 13 21:52
.bash_history 2532    Dec 13 20:24 Makefile.am 3440     Feb 13 2021
.keep     0        Nov 27 21:08 Makefile.in 75071    Dec 13 21:52
.keep_acct-user_root-0 0        Nov 28 21:24 compat-api.h 3515     Feb 13 2021
.viminfo   9489    Dec 7 18:18 dfps.c     11782    Feb 13 2021
          2532    Dec 13 20:24 dfps.h     1276     Feb 13 2021
          0        Nov 27 21:08 mspace.c   83600    Feb 13 2021
          0        Nov 28 21:24 mspace.h   4882     Feb 13 2021
          9489    Dec 7 18:18 murmurhash3.c 7988     Feb 13 2021
          0        Nov 28 21:24 murmurhash3.h 1149     Feb 13 2021
          9489    Dec 7 18:18 qxl.h      19413    Feb 13 2021
          9489    Dec 7 18:18 qxl_cursor.c 5973     Feb 13 2021
          9489    Dec 7 18:18 qxl_driver.c 43575    Feb 13 2021
          9489    Dec 7 18:18 qxl_driver.c.orig 43575    Dec 13 22:05
          9489    Dec 7 18:18 qxl_drvmode.c 17618    Feb 13 2021
          9489    Dec 7 18:18 qxl_drvmode.h 2911     Dec 13 21:52

```

Открываем драйвер `qxl_driver.c` на редактирование:

```
localhost /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work/src # vim qxl_driver.c
```

В редакторе набираем `:1007` и вставляем после этой строки код:

```

if (qxl->num_heads == 0) {
    xf86DrvMsg (scrnIndex, X_INFO, "QXL_NUM_HEADS not
configured, defaulting to 1\n");
    qxl->num_heads = 1;
}

```

```

qxl->enable_image_cache =
    get_bool_option (qxl->options, OPTION_ENABLE_IMAGE_CACHE, "QXL_ENABLE_IMAGE_CACHE");
qxl->enable_fallback_cache =
    get_bool_option (qxl->options, OPTION_ENABLE_FALLBACK_CACHE, "QXL_ENABLE_FALLBACK_CACHE");
qxl->enable_surfaces =
    get_bool_option (qxl->options, OPTION_ENABLE_SURFACES, "QXL_ENABLE_SURFACES");
qxl->debug_render_fallbacks =
    get_bool_option (qxl->options, OPTION_DEBUG_RENDER_FALLBACKS, "QXL_DEBUG_RENDER_FALLBACKS");
qxl->num_heads =
    get_int_option (qxl->options, OPTION_NUM_HEADS, "QXL_NUM HEADS");
    if (qxl->num_heads == 0) {
        xf86DrvMsg (scrnIndex, X_INFO, "QXL_NUM_HEADS not configured, defaulting to 1\n");
        qxl->num_heads = 1;
    }

qxl->deferred_fps = get_int_option(qxl->options, OPTION_SPICE_DEFERRED_FPS, "XSPICE_DEFERRED_FPS");
if (qxl->deferred_fps > 0)
    xf86DrvMsg(scrnIndex, X_INFO, "Deferred FPS: %d\n", qxl->deferred_fps);
else
    xf86DrvMsg(scrnIndex, X_INFO, "Deferred Frames: Disabled\n");

xf86DrvMsg (scrnIndex, X_INFO, "Offscreen Surfaces: %s\n",
    qxl->enable_surfaces ? "Enabled" : "Disabled");
xf86DrvMsg (scrnIndex, X_INFO, "Image Cache: %s\n",
    qxl->enable_image_cache ? "Enabled" : "Disabled");
xf86DrvMsg (scrnIndex, X_INFO, "Fallback Cache: %s\n",
    qxl->enable_fallback_cache ? "Enabled" : "Disabled");

return TRUE;
out:
-- INSERT --

```

Далее переходим выше на одну директорию и сравниваем наши файлы с помощью утилиты `diff`:

```
localhost /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work # diff -u src/qxl_driver.c src/qxl_driver.c.orig
```

```

localhost ~ # mc
localhost /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work # diff -u src/qxl_driver.c src/qxl_driver.c.orig
--- src/qxl_driver.c      2022-12-13 22:25:45.608000000 -0000
+++ src/qxl_driver.c.orig  2022-12-13 22:05:28.176000000 -0000
@@ -1005,10 +1005,6 @@
     get_bool_option (qxl->options, OPTION_DEBUG_RENDER_FALLBACKS, "QXL_DEBUG_RENDER_FALLBACKS");
     qxl->num_heads =
         get_int_option (qxl->options, OPTION_NUM HEADS, "QXL_NUM HEADS");
-    if (qxl->num_heads == 0) {
-        xf86DrvMsg (scrnIndex, X_INFO, "QXL_NUM_HEADS not configured, defaulting to 1\n");
-        qxl->num_heads = 1;
-    }

     qxl->deferred_fps = get_int_option(qxl->options, OPTION_SPICE_DEFERRED_FPS, "XSPICE_DEFERRED_FPS");
     if (qxl->deferred_fps > 0)
localhost /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work #

```

Так как нам необходимо добавить строки в оригинальный файл, поменяем их местами:

```
localhost /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work # diff -u src/qxl_driver.c.orig src/qxl_driver.c
```

```
localhost /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work # diff -u src/qxl_driver.c.orig src/qxl_driver.c
--- src/qxl_driver.c.orig      2022-12-13 22:05:28.176000000 -0000
+++ src/qxl_driver.c          2022-12-13 22:25:45.608000000 -0000
@@ -1005,6 +1005,10 @@
     get_bool_option (qxl->options, OPTION_DEBUG_RENDER_FALLBACKS, "QXL_DEBUG_RENDER_FALLBACKS");
     qxl->num_heads =
     get_int_option (qxl->options, OPTION_NUM_HEADS, "QXL_NUM_HEADS");
+   if (qxl->num_heads == 0) {
+     xf86DrvMsg (scrnIndex, X_INFO, "QXL_NUM_HEADS not configured, defaulting to 1\n");
+     qxl->num_heads = 1;
+   }

     qxl->deferred_fps = get_int_option(qxl->options, OPTION_SPICE_DEFERRED_FPS, "XSPICE_DEFERRED_FPS");
     if (qxl->deferred_fps > 0)
localhost /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work #
```

Результат сравнения перенаправим в отдельный файл:

```
localhost /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work # diff -u src/qxl_driver.c.orig src/qxl_driver.c > ~/0001_qxl_head_fix.patch
```

Переходим в домашнюю директорию и открываем файл `0001_qxl_head_fix.patch` на редактирование:

```
localhost /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work # cd ~
localhost ~ # vim 0001_qxl_head_fix.patch
```

Вносим следующие изменения в первые две строки:

```
--- a/src/qxl_driver.c 2022-12-13 22:05:28.176000000 -0000
+++ b/src/qxl_driver.c 2022-12-13 22:25:45.608000000 -0000
@@ -1005,6 +1005,10 @@
     get_bool_option (qxl->options, OPTION_DEBUG_RENDER_FALLBACKS, "QXL_DEBUG_RENDER_FALLBACKS");
     qxl->num_heads =
     get_int_option (qxl->options, OPTION_NUM_HEADS, "QXL_NUM_HEADS");
+   if (qxl->num_heads == 0) {
+     xf86DrvMsg (scrnIndex, X_INFO, "QXL_NUM_HEADS not configured, defaulting to 1\n");
+     qxl->num_heads = 1;
+   }

     qxl->deferred_fps = get_int_option(qxl->options, OPTION_SPICE_DEFERRED_FPS, "XSPICE_DEFERRED_FPS");
     if (qxl->deferred_fps > 0)
~
```

Переходим в директорию `/etc/portage` и создаем в ней директорию `patches`:

```
localhost /etc/portage # mkdir patches
```

Left	File	Command	Options	Right	
<-	/etc/portage			<- ~	
.n	Name			.n	Name
..		UP	--DIR	..	
~make.profile		82	Nov 28 20:50	/.cache	4096
/package.accept_keywords		4096	Nov 27 21:30	/.config	4096
/package.mask		4096	Nov 27 21:30	/.local	4096
/package.use		4096	Dec 12 19:43	.bash_history	2583
/patches		4096	Dec 14 19:25	.keep	0
/profile		4096	Nov 26 17:05	.keep_acct-user_root-0	0
/savedconfig		4096	Dec 4 20:44	.viminfo	10340
make.conf		811	Nov 28 20:54	0001_qxl_head_fix.patch	619

Переходим в директорию `patches` и создаем в ней структуру директорий:

```
localhost /etc/portage/patches # mkdir -p x11-drivers/xf86-video-qxl
```

Копируем наш патч в директорию `/etc/portage/patches/x11-drivers/xf86-video-qxl`:

Left	File	Command	Options	Right
<-	../etc/patches/x11-drivers/xf86-video-qxl			.[^]>
.n	Name	Size	Modify time	.n
UP--	UP--DIR	UP--DIR	UP--DIR	UP--DIR
0001_qxl_head_fix.patch		639	Dec 14 19:19	Dec 7 21:08
				Dec 7 19:21
				Dec 6 20:52
				Dec 6 20:21
				Dec 13 22:27
				Nov 27 21:08
				Nov 28 21:24
				Dec 14 19:19
				Dec 14 19:19

Выполним установку пакета `x11-drivers/xf86-video-qxl`:

```
localhost ~ # emerge x11-drivers/xf86-video-qxl
```

```
>>> Emerging (1 of 1) x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1::gentoo
* xf86-video-qxl-0.1.5_p20200205.tar.xz BLAKE2B SHA512 size ;-) ... [ ok ]
>>> Unpacking source...
>>> Unpacking xf86-video-qxl-0.1.5_p20200205.tar.xz to /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work
>>> Source unpacked in /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work
>>> Preparing source in /var/tmp/portage/x11-drivers/xf86-video-qxl-0.1.5_p20200205-r1/work ...
* Applying xf86-video-qxl-0.1.5_p20200205-xorg-21.0-build.patch ... [ ok ]
* Applying xf86-video-qxl-0.1.5_p20200205-xorg-21.0-build-bool.patch ... [ ok ]
*
=====
* Applying user patches from /etc/portage/patches ...
* Applying 0001_qxl_head_fix.patch ... [ ok ]
User patches applied.
=====
```

Видим, что наш патч применился.

Попробуем запустить `Xorg`:

```
localhost ~ # X
X.Org X Server 1.21.1.4
X Protocol Version 11, Revision 0
Current Operating System: Linux localhost 5.15.75-gentoo-x86_64 #1 SMP Tue Dec 6 15:53:46 -00 2022 x86_64
Kernel command line: BOOT_IMAGE=/boot/vmlinuz-5.15.75-gentoo-x86_64 root=UUID=1484fdd8-4f65-4dbd-8b4d-810db8f037e2 ro init=/lib/systemd/systemd

Current version of pixman: 0.40.0
  Before reporting problems, check http://wiki.x.org
  to make sure that you have the latest version.
Markers: (--) probed, (**) from config file, (==) default setting,
  (++) from command line, (!!) notice, (II) informational,
  (WW) warning, (EE) error, (NI) not implemented, (??) unknown.
(==) Log file: "/var/log/Xorg.0.log", Time: Wed Dec 14 19:49:12 2022
(==) Using system config directory "/usr/share/X11/xorg.conf.d"
resizing surface0 to 16777216
memory space from 0x7f9bd46d9000 to 0x7f9bd76d6000
memory space from 0x7f9bcf6d9000 to 0x7f9bd36d9000
resizing surface0 to 16777216
memory space from 0x7f9bd475a000 to 0x7f9bd7757000
memory space from 0x7f9bcf75a000 to 0x7f9bd375a000
ram_header at 67100672
surf0 size: 16777216
slots start: 1, slots end: 7
done reset
^CDisabling FB access for 0
(II) Server terminated successfully (0). Closing log file.
localhost ~ #
```

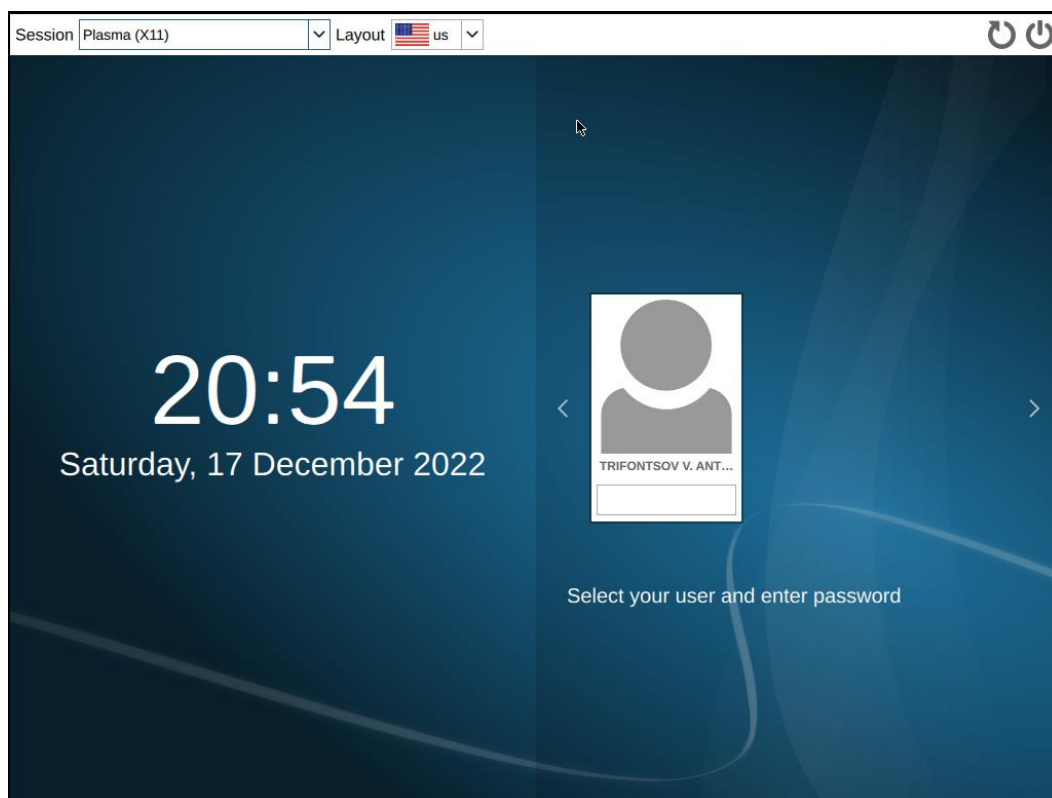
Видим, что команда выполнена без ошибок, сервер `Xorg` запустился. При этом экран ВМ станет черным.

Запускаем `sddm`:

```
localhost ~ # systemctl start sddm
```

Антон Трифонов

В результате выполнения команды, на экране ВМ увидим окно входа в операционную систему:



Обратите внимание, что в окне **Session** должно быть установлено значение **Plasma (X11)**. Вводим пароль учетной записи.



Далее необходимо установить русский язык в систему.

Останавливаем **sddm**:

```
localhost ~ # systemctl stop sddm
```

Для русской консоли необходимо установить следующий пакет:

```
localhost ~ # eix terminus
```

```
localhost ~ # eix terminus
* media-fonts/terminus-font
  Available versions: 4.49.1 [X a-like-o +center-tilde distinct-l +otf pcf-8bit +pcf-unicode +psf quote
ru-dv +ru-g ru-i ru-k]
  Homepage:          http://terminus-font.sourceforge.net/
  Description:       A clean fixed font for the console and X11

localhost ~ #
```

```
localhost ~ # emerge -vp media-fonts/terminus-font
```

```
localhost ~ # emerge -vp media-fonts/terminus-font

These are the packages that would be merged, in order:

Calculating dependencies... done!
[ebuild N    ] x11-apps/bdftopcf-1.1-r1::gentoo 148 KiB
[ebuild N    ] media-fonts/terminus-font-4.49.1::gentoo USE="X center-tilde otf pcf-unicode psf ru-g -
a-like-o -distinct-l -pcf-8bit -quote -ru-dv -ru-i -ru-k" 634 KiB

Total: 2 packages (2 new), Size of downloads: 781 KiB

* IMPORTANT: 3 news items need reading for repository 'gentoo'.
* Use eselect news read to view new items.

localhost ~ #
```

Видим, что нам потребуются следующие ключи: **-ru-dv -ru-i -ru-k**

Вводим следующую команду:

```
localhost ~ # la -la /etc/portage/package.use/package.use
```

```
localhost ~ # ls -la /etc/portage/package.use/package.use
-rw-r--r-- 1 root root 22 Dec 12 19:43 /etc/portage/package.use/package.use
localhost ~ #
```

Добавим в файл следующую строку:

```
localhost ~ # vim /etc/portage/package.use/package.use
```

```
media-fonts/terminus-font ru-dv ru-i ru-k
```

```
net-misc/dhcp -server

media-fonts/terminus-font ru-dv ru-i ru-k
~
~
~
~
-- INSERT --                               4,42      All
```

Еще раз проверяем какие пакеты с какими ключами будут установлены:

```
localhost ~ # emerge -vp media-fonts/terminus-font
```

```
localhost ~ # emerge -vp media-fonts/terminus-font

These are the packages that would be merged, in order:

Calculating dependencies... done!
[ebuild N    ] x11-apps/bdftopcf-1.1-r1::gentoo 148 KiB
[ebuild N    ] media-fonts/terminus-font-4.49.1::gentoo USE="X center-tilde otf pcf-unicode psf ru-dv
ru-g ru-i ru-k -a-like-o -distinct-l -pcf-8bit -quote" 634 KiB

Total: 2 packages (2 new), Size of downloads: 781 KiB

* IMPORTANT: 3 news items need reading for repository 'gentoo'.
* Use eselect news read to view new items.

localhost ~ #
```

Видим, что наши ключи **-ru-dv -ru-i -ru-k** добавились.

Устанавливаем пакет:

```
localhost ~ # emerge media-fonts/terminus-font

>>> Installing (2 of 2) media-fonts/terminus-font-4.49.1::gentoo
* The following fontconfig configuration files have been installed:
*
*   75-yes-terminus.conf
*
* Use `eselect fontconfig` to enable/disable them.
* Updating global fontcache ... [ ok ]

>>> Recording media-fonts/terminus-font in "world" favorites file...

* Messages for package media-fonts/terminus-font-4.49.1:
* The following fontconfig configuration files have been installed:
*
*   75-yes-terminus.conf
*
* Use `eselect fontconfig` to enable/disable them.
*
* GNU info directory index is up-to-date.

* IMPORTANT: 3 news items need reading for repository 'gentoo'.
* Use eselect news read to view new items.

localhost ~ #
```

Проверим текущие параметры региональных настроек:

```
localhost ~ # locale

localhost ~ # locale
LANG=C.UTF8
LC_CTYPE="C.UTF8"
LC_NUMERIC="C.UTF8"
LC_TIME="C.UTF8"
LC_COLLATE="C.UTF8"
LC_MONETARY="C.UTF8"
LC_MESSAGES="C.UTF8"
LC_PAPER="C.UTF8"
LC_NAME="C.UTF8"
LC_ADDRESS="C.UTF8"
LC_TELEPHONE="C.UTF8"
LC_MEASUREMENT="C.UTF8"
LC_IDENTIFICATION="C.UTF8"
LC_ALL=
localhost ~ #
```

Изменим региональные настройки для России:

```
localhost ~ # eselect locale list ru_RU
localhost ~ # eselect locale set 639
localhost ~ # . /etc/profile
```

```
localhost ~ # eselect locale list | grep ru_RU
[636] ru_RU
[637] ru_RU.iso88595
[638] ru_RU.koi8r
[639] ru_RU.utf8
localhost ~ # eselect locale set 639
Setting LANG to ru_RU.utf8 ...
Run ". /etc/profile" to update the variable in your shell.
localhost ~ # . /etc/profile
```

```
localhost ~ # locale
LANG=ru_RU.utf8
LC_CTYPE="ru_RU.utf8"
LC_NUMERIC="ru_RU.utf8"
LC_TIME="ru_RU.utf8"
LC_COLLATE="ru_RU.utf8"
LC_MONETARY="ru_RU.utf8"
LC_MESSAGES="ru_RU.utf8"
LC_PAPER="ru_RU.utf8"
LC_NAME="ru_RU.utf8"
LC_ADDRESS="ru_RU.utf8"
LC_TELEPHONE="ru_RU.utf8"
LC_MEASUREMENT="ru_RU.utf8"
LC_IDENTIFICATION="ru_RU.utf8"
LC_ALL=
localhost ~ # █
```

Видим, что настройки изменились.

Далее необходимо изменить временную зону:

```
localhost ~ # date
Сб 17 дек 2022 22:26:50 -00
localhost ~ #
```

Для этого создадим символическую ссылку на следующий файл:

```
localhost ~ # ln -sfv /usr/share/zoneinfo/Europe/Moscow
/etc/localtime
```

```
localhost ~ # date
Сб 17 дек 2022 22:34:46 -00
localhost ~ # ln -sfv /usr/share/zoneinfo/Europe/Moscow /etc/localtime
'/etc/localtime' -> '/usr/share/zoneinfo/Europe/Moscow'
```

Проверяем еще раз:

```
localhost ~ # date
Вс 18 дек 2022 01:34:56 MSK
localhost ~ # █
```

Видим, что временная зона установлена по Москве.

Далее изменим название нашей машины:

```
localhost ~ # vim /etc/hostname
```

```
gentoo-pc █
~
~
~
~
~
~
-- ВСТАВКА --
1,10  Весь
```

Сохраняем изменения и перезагружаем систему:

```
localhost ~ # reboot
```

```

This is gentoo-pc.unknown_domain (Linux x86_64 5.15.75-gentoo-x86_64) 01:48:27

gentoo-pc login: [ 8.261197] input: ImExPS/2 Generic Explorer Mouse as /devices/platform/i8042/serio1/input/input3
tech
Password:
Last login: Sun Dec 18 00:25:41 MSK 2022 from 10.100.10.1 on pts/0
tech@gentoo-pc ~ $ sudo su -
#####
##### ■■■■ ■■■■ ■■■■ 18 00:25:51 MSK 2022 ■■■■ pts/0
gentoo-pc ~ #

```

Видим, что название поменялось, но не отображаются русские символы (вместо них квадратики), исправим этот недостаток.

Получим ip адрес и подключимся к VM с хост машины:

```

gentoo-pc ~ # ip a
gentoo-pc ~ # dhclient enp3s0
gentoo-pc ~ # ip a

```

```

gentoo-pc ~ # ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp3s0: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN group default qlen 1000
    link/ether 52:54:00:85:9c:66 brd ff:ff:ff:ff:ff:ff
gentoo-pc ~ # dhclient enp3s0
Failed to set DNS configuration: Unit dbus-org.freedesktop.resolve1.service not found.
gentoo-pc ~ # ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp3s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 52:54:00:85:9c:66 brd ff:ff:ff:ff:ff:ff
    inet 10.100.10.56/26 brd 10.100.10.63 scope global enp3s0
        valid_lft forever preferred_lft forever
    inet6 fe80::5054:ff:fe85:9c66/64 scope link
        valid_lft forever preferred_lft forever
gentoo-pc ~ #

```

Создадим файл `/etc/vconsole.conf` со следующими параметрами:

```

gentoo-pc ~ # vim /etc/vconsole.conf

FONT=ter-u16b

```

```

FONT=ter-u16b
~
~
~
~
-- ВСТАВКА --
1,14  Весь

```

Добавляем в автозагрузку службу `systemd-vconsole-setup`, запускаем её и смотрим статус:

```

gentoo-pc ~ # systemctl enable systemd-vconsole-setup
gentoo-pc ~ # systemctl start systemd-vconsole-setup
gentoo-pc ~ # systemctl status systemd-vconsole-setup

```

```

gentoo-pc ~ # systemctl enable systemd-vconsole-setup
The unit files have no installation config (WantedBy=, RequiredBy=, Also=,
Alias= settings in the [Install] section, and DefaultInstance= for template
units). This means they are not meant to be enabled using systemctl.

Possible reasons for having this kind of units are:
• A unit may be statically enabled by being symlinked from another unit's
.wants/ or .requires/ directory.
• A unit's purpose may be to act as a helper for some other unit which has
a requirement dependency on it.
• A unit may be started when needed via activation (socket, path, timer,
D-Bus, udev, scripted systemctl call, ...).
• In case of template units, the unit is meant to be enabled with some
instance name specified.
gentoo-pc ~ # systemctl start systemd-vconsole-setup
gentoo-pc ~ # systemctl status systemd-vconsole-setup
● systemd-vconsole-setup.service - Setup Virtual Console
   Loaded: loaded (/lib/systemd/system/systemd-vconsole-setup.service; static)
   Active: active (exited) since Sun 2022-12-18 02:16:15 MSK; 5s ago
     Docs: man:systemd-vconsole-setup.service(8)
           man:vconsole.conf(5)
   Process: 1118 ExecStart=/lib/systemd/systemd-vconsole-setup (code=exited, status=0/SUCCESS)
   Main PID: 1118 (code=exited, status=0/SUCCESS)
      CPU: 42ms

дек 18 02:16:15 gentoo-pc systemd[1]: Starting Setup Virtual Console...
дек 18 02:16:15 gentoo-pc systemd[1]: Finished Setup Virtual Console.
gentoo-pc ~ #

```

Переходим в ВМ:

```

tech@gentoo-pc ~ $ sudo su -
Пароль:
Последний вход в систему: Вс дек 18 01:59:26 MSK 2022 на pts/0
gentoo-pc ~ #

```

Видим, что изменения применились.

Проверим статус службы **NetworkManager**:

```
gentoo-pc ~ # systemctl status NetworkManager
```

```

gentoo-pc ~ # systemctl status NetworkManager
○ NetworkManager.service - Network Manager
   Loaded: loaded (/lib/systemd/system/NetworkManager.service; disabled; preset: disabled)
   Active: inactive (dead)
     Docs: man:NetworkManager(8)
gentoo-pc ~ #

```

Видим, что служба не запущена. Добавляем её в автозагрузку и запускаем:

```
gentoo-pc ~ # systemctl enable NetworkManager
gentoo-pc ~ # systemctl start NetworkManager
```

```

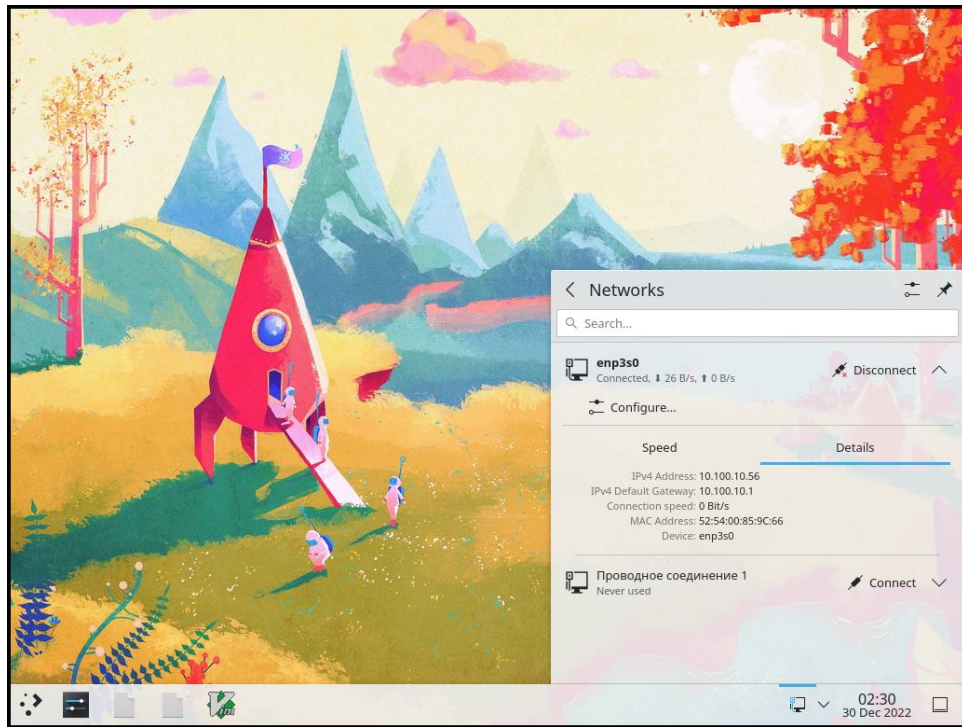
gentoo-pc ~ # systemctl enable NetworkManager
Created symlink /etc/systemd/system/multi-user.target.wants/NetworkManager.service → /lib/systemd/system/NetworkManager.service.
Created symlink /etc/systemd/system/dbus-org.freedesktop.nm-dispatcher.service → /lib/systemd/system/NetworkManager-dispatcher.service.
Created symlink /etc/systemd/system/network-online.target.wants/NetworkManager-wait-online.service → /lib/systemd/system/NetworkManager-wait-online.service.
gentoo-pc ~ # systemctl start NetworkManager
gentoo-pc ~ #

```

Запускаем **sddm** и добавляем его в автозагрузку:

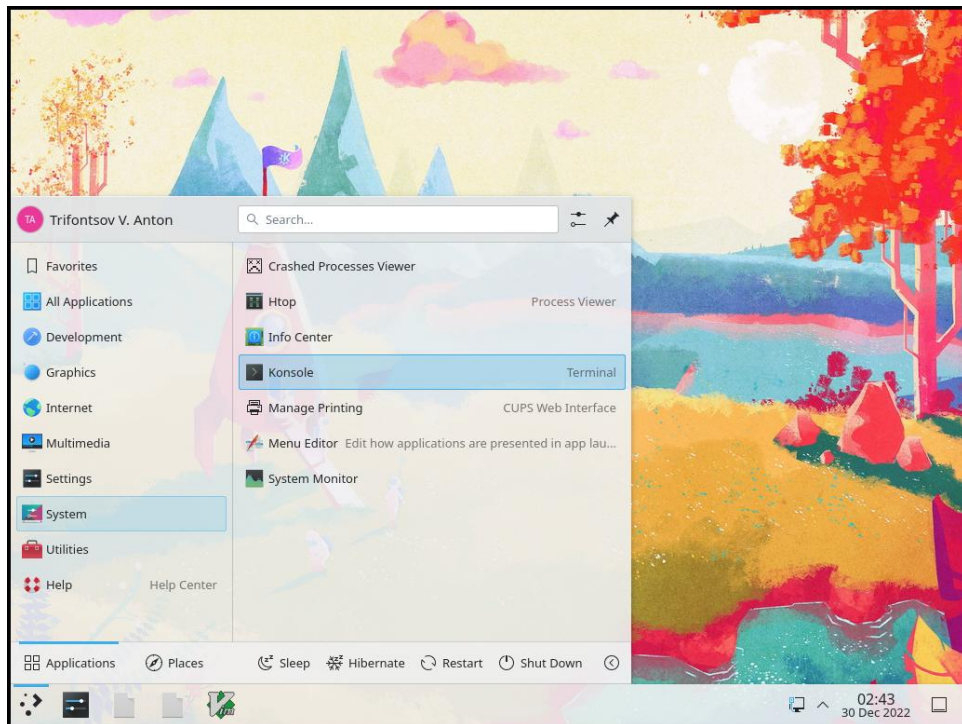
```
gentoo-pc ~ # systemctl start sddm
gentoo-pc ~ # systemctl enable sddm
```

Вводим пароль от учетной записи в окне входа.



Видим, что у нас появилась сеть.

Запускаем консоль терминала.



В консоли терминала выполним команду **uname -a**:

```
gentoo-pc ~ # uname -a
```

```
gentoo-pc ~ # uname -a
Linux gentoo-pc 5.15.75-gentoo-x86_64 #1 SMP Tue Dec 6 15:53:46 -00 2022 x86_64 Intel Core i7 9xx (Nehalem Core i7, IBRS upd
ate) GenuineIntel GNU/Linux
gentoo-pc ~ #
```

Установим утилиту для создания снимков экрана – **spectacle**:

```
gentoo-pc ~ # eix spectacle
gentoo-pc ~ # emerge -vp spectacle
gentoo-pc ~ # emerge spectacle
```

```
tech@gentoo-pc ~ $ sudo su -
Password:
Last login: Sun Dec 18 02:17:58 MSK 2022 on tty1
gentoo-pc ~ # eix spectacle
* kde-apps/spectacle
  Доступные версии:      (5) 22.04.3^t ~22.08.3^t
    {+annotate debug +handbook share test}
  Домашняя страница:    https://apps.kde.org/spectacle/
  Описание:              Screenshot capture utility

gentoo-pc ~ # emerge -vp spectacle
* Last emerge --sync was Пн 28 ноя 2022 23:10:01.

These are the packages that would be merged, in order:

Calculating dependencies... done!
[ebuild N ] media-libs/kcolorpicker-0.1.6::gentoo USE="--test" 12 KiB
[ebuild N ] media-libs/kimageannotator-0.5.3::gentoo USE="--test" 215 KiB
[ebuild N ] kde-apps/spectacle-22.04.3:5::gentoo USE="annotate handbook -debug -share -test" 1 234 KiB

Total: 3 packages (3 new), Size of downloads: 1 461 KiB

* IMPORTANT: 3 news items need reading for repository 'gentoo'.
* Use eselect news read to view new items.

gentoo-pc ~ # emerge spectacle
```

Установим файловый менеджер **Dolphin**, используемый в среде рабочего стола KDE:

```
gentoo-pc ~ # eix dolphin
gentoo-pc ~ # emerge -vp kde-apps/dolphin
gentoo-pc ~ # emerge kde-apps/dolphin
```

После установки **Dolphin**, нам предлагают установить дополнительные пакеты, в частности архиватор **ark:5**. Устанавливаем его:

```
gentoo-pc ~ # emerge kde-apps/ark:5
```

```
* Messages for package kde-apps/dolphin-22.04.3:

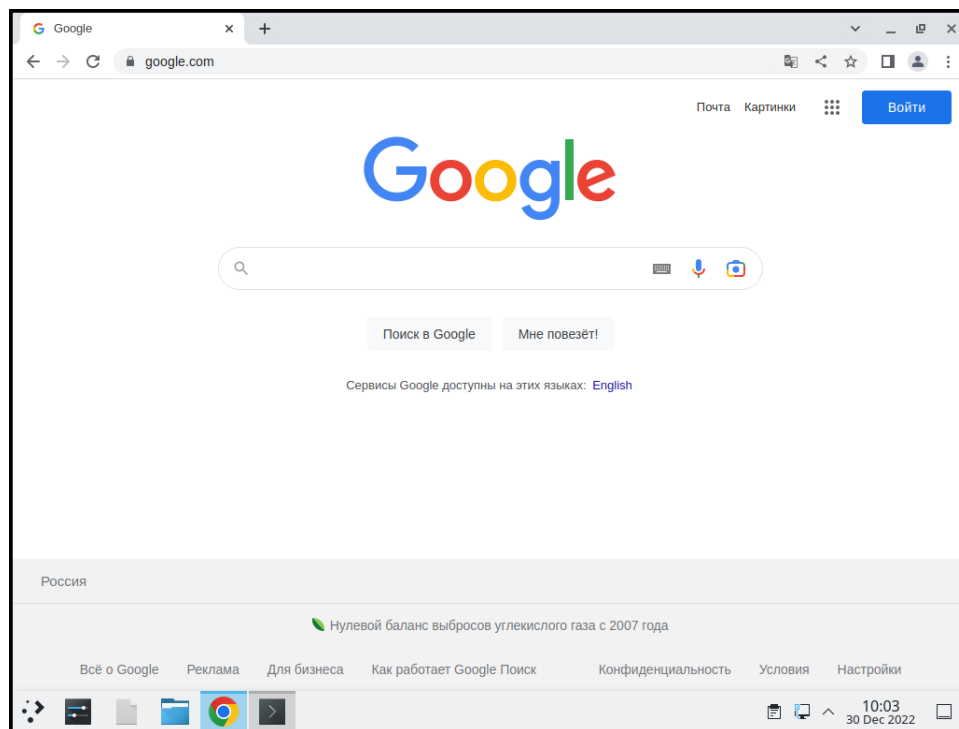
* Install additional packages for optional runtime features:
* kde-apps/ark:5 for compress/extract and other actions
* kde-apps/kleopatra:5 for crypto actions
* kde-apps/ffmpegthumbs:5 for video file thumbnails
* kde-apps/thumbnaillers:5 for graphics file thumbnails

* GNU info directory index is up-to-date.

* IMPORTANT: 3 news items need reading for repository 'gentoo'.
* Use eselect news read to view new items.
```

Установим браузер, например, **Google Chrome**:

```
gentoo-pc ~ # eix google
gentoo-pc ~ # emerge www-client/google-chrome
```



Установим офисный пакет **LibreOffice**:

```
gentoo-pc ~ # eix libreoffice
gentoo-pc ~ # emerge app-office/libreoffice-bin
```

