

# Отчёт по лабораторной работе №8

Настройка SMTP-сервера (Postfix)

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17 декабря 2025

## Цели и задачи работы

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Приобретение практических навыков по установке и конфигурированию SMTP-сервера (Postfix) и проверке доставки почты в локальной сети и по доменному имени.

## Выполнение лабораторной работы

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# Установка Postfix на сервере

```
Installed:
  postfix-2:3.8.5-8.el10.x86_64          postfix-lmdb-2:3.8.5-8.el10.x86_64          s-nail-14.9.24-12.el10.x86_64

Complete!
[root@server.zmustafaev.net ~]# firewall-cmd --add-service=smtp
success
[root@server.zmustafaev.net ~]# firewall-cmd --add-service=smtp --permanent
success
[root@server.zmustafaev.net ~]# firewall-cmd --list-services
cockpit dhcp dhcpv6-client dns http https smtp ssh ssh-custom
[root@server.zmustafaev.net ~]# restorecon -vR /etc
Relabeled /etc/NetworkManager/system-connections/eth1.nmconnection from unconfined_u:object_r:user_tmp_t:s0 to unconfined_u:object_r:NetworkManager_etc_rw_t:s0
[root@server.zmustafaev.net ~]# systemctl enable postfix
Created symlink '/etc/systemd/system/multi-user.target.wants/postfix.service' → '/usr/lib/systemd/system/postfix.service'.
[root@server.zmustafaev.net ~]# systemctl start postfix
[root@server.zmustafaev.net ~]# █
```

Рис. 1: Запуск и включение Postfix

## Просмотр параметров Postfix (postconf)

```
[root@server.zmustaraev.net ~]#  
[root@server.zmustaraev.net ~]# postconf  
2bounce_notice_recipient = postmaster  
access_map_defer_code = 450  
access_map_reject_code = 554  
address_verify_cache_cleanup_interval = 12h  
address_verify_default_transport = $default_transport  
address_verify_local_transport = $local_transport  
address_verify_map = btree:$data_directory/verify_cache  
address_verify_negative_cache = yes  
address_verify_negative_expire_time = 3d  
address_verify_negative_refresh_time = 3h  
address_verify_pending_request_limit = 5000  
address_verify_poll_count = ${stress?{1}:{3}}  
address_verify_poll_delay = 3s  
address_verify_positive_expire_time = 31d  
address_verify_positive_refresh_time = 7d  
address_verify_relay_transport = $relay_transport  
address_verify_relayhost = $relayhost  
address_verify_sender = $double_bounce_sender  
address_verify_sender_dependent_default_transport_maps = $sender_dependent_default_transport_maps  
address_verify_sender_dependent_relayhost_maps = $sender_dependent_relayhost_maps  
address_verify_sender_ttl = 0s  
address_verify_service_name = verify  
address_verify_transport_maps = $transport_maps  
address_verify_virtual_transport = $virtual_transport  
alias_database = lmdb:/etc/aliases  
alias_maps = lmdb:/etc/aliases  
allow_mail_to_commands = alias, forward  
allow_mail_to_files = alias, forward  
allow_min_user = no  
allow_percent_hack = yes  
allow_srv_lookup_fallback = no  
allow_untrusted_routing = no  
alternate_config_directories =  
always_add_missing_headers = no
```

```
[root@server.zmustafaev.net ~]#  
[root@server.zmustafaev.net ~]# postconf myorigin  
myorigin = $myhostname  
[root@server.zmustafaev.net ~]# postconf mydomain  
mydomain = zmustafaev.net  
[root@server.zmustafaev.net ~]# postconf -e 'myorigin = $mydomain'  
[root@server.zmustafaev.net ~]# postconf myorigin  
myorigin = $mydomain  
[root@server.zmustafaev.net ~]# postfix check  
[root@server.zmustafaev.net ~]# systemctl reload postfix  
[root@server.zmustafaev.net ~]#
```

Рис. 3: Изменение параметра myorigin

```
[root@server.zmustafaev.net ~]#  
[root@server.zmustafaev.net ~]# postconf -e 'mydomain = zmustafaev.net'  
[root@server.zmustafaev.net ~]# postconf inet_protocols  
inet_protocols = all  
[root@server.zmustafaev.net ~]# postconf -e 'inet_protocols = ipv4'  
[root@server.zmustafaev.net ~]# postfix check  
[root@server.zmustafaev.net ~]# systemctl reload postfix.service  
[root@server.zmustafaev.net ~]# █
```

Рис. 4: Отключение IPv6 в Postfix



## Проверка отправки почты на сервере

```
[zmustafaev@server.zmustafaev.net mail]$ echo . | mail -s test1 zmustafaev@server.zmustafaev.net
[zmustafaev@server.zmustafaev.net mail]$ cd /var/spool/mail/
[zmustafaev@server.zmustafaev.net mail]$ cat zmustafaev
From zmustafaev@zmustafaev.net Wed Dec 17 07:03:58 2025
Return-Path: <zmustafaev@zmustafaev.net>
X-Original-To: zmustafaev@server.zmustafaev.net
Delivered-To: zmustafaev@server.zmustafaev.net
Received: by server.zmustafaev.net (Postfix, from userid 1001)
        id 9EB9A47083; Wed, 17 Dec 2025 07:03:58 +0000 (UTC)
Date: Wed, 17 Dec 2025 07:03:58 +0000
To: zmustafaev@server.zmustafaev.net
Subject: test1
User-Agent: s-nail v14.9.24
Message-Id: <20251217070358.9EB9A47083@server.zmustafaev.net>
From: zmustafaev@zmustafaev.net
.

[zmustafaev@server.zmustafaev.net mail]$ █
```

Рис. 5: Отправка тестового письма с сервера

```
Dec 17 07:03:58 server postfix/pickup[13997]: 9EB9A47083: uid=1001 from=<zmustafaev>  
Dec 17 07:03:58 server postfix/cleanup[14060]: 9EB9A47083: message-id=<20251217070358.9EB9A47083@server.zmustafaev.net>  
Dec 17 07:03:58 server postfix/qmgr[13998]: 9EB9A47083: from=<zmustafaev@zmustafaev.net>, size=342, nrcpt=1 (queue active)  
Dec 17 07:03:58 server postfix/local[14063]: 9EB9A47083: to=<zmustafaev@server.zmustafaev.net>, relay=local, delay=0.01, delays=0.01/0/  
0/0, dsn=2.0.0, status=sent (delivered to mailbox)  
Dec 17 07:03:58 server postfix/qmgr[13998]: 9EB9A47083: removed
```

Рис. 6: Журнал доставки письма на сервере

```
Installed:
 postfix-2:3.8.5-8.el10.x86_64      postfix-lmdb-2:3.8.5-8.el10.x86_64
 s-nail-14.9.24-12.el10.x86_64

Complete!
[root@client.zmustafaev.net ~]#
[root@client.zmustafaev.net ~]# postconf inet_protocols
inet_protocols = all
[root@client.zmustafaev.net ~]# postconf -e 'inet_protocols = ipv4'
[root@client.zmustafaev.net ~]# systemctl enable postfix
Created symlink '/etc/systemd/system/multi-user.target.wants/postfix.service' →
'/usr/lib/systemd/system/postfix.service'.
[root@client.zmustafaev.net ~]# systemctl start postfix.service
[root@client.zmustafaev.net ~]# █
```

Рис. 7: Установка и настройка Postfix на клиенте

## inet\_interfaces и mynetworks на сервере

```
[root@server.zmustafaev.net ~]#  
[root@server.zmustafaev.net ~]# postconf inet_interfaces  
inet_interfaces = localhost  
[root@server.zmustafaev.net ~]# postconf mynetworks  
mynetworks = 127.0.0.1/32  
[root@server.zmustafaev.net ~]# postconf -e 'inet_interfaces = all'  
[root@server.zmustafaev.net ~]# postconf -e 'mynetworks = 127.0.0.0/8, 192.168.0.0/16'  
[root@server.zmustafaev.net ~]# postfix check  
[root@server.zmustafaev.net ~]# systemctl reload postfix.service  
[root@server.zmustafaev.net ~]# systemctl stop postfix.service  
[root@server.zmustafaev.net ~]# systemctl staert postfix.service  
Unknown command verb 'staert', did you mean 'start'?  
[root@server.zmustafaev.net ~]# systemctl start postfix.service  
[root@server.zmustafaev.net ~]# █
```

Рис. 8: Проверка параметров inet\_interfaces и mynetworks

## Клиент → сервер: успешная доставка

```
Dec 17 07:08:57 server postfix/smtpd[14928]: warning: run-time library vs. compile-time header version mismatch: OpenSSL 3.5.0 may not be compatible with OpenSSL 3.2.0
Dec 17 07:08:57 server postfix/smtpd[14928]: connect from client.zmustafaev.net[192.168.1.30]
Dec 17 07:08:57 server postfix/smtpd[14928]: 7F48E47082: client=client.zmustafaev.net[192.168.1.30]
Dec 17 07:08:57 server postfix/cleanup[14932]: 7F48E47082: message-id=<20251217070857.75D262415AC6@client.zmustafaev.net>
Dec 17 07:08:57 server postfix/qmgr[14881]: 7F48E47082: from=<zmustafaev@client.zmustafaev.net>, size=573, nrcpt=1 (queue active)
Dec 17 07:08:57 server postfix/smtpd[14928]: disconnect from client.zmustafaev.net[192.168.1.30] ehlo=2 starttls=1 mail=1 rcpt=1 data=1 quit=1 commands=7
Dec 17 07:08:57 server postfix/local[14933]: 7F48E47082: to=<zmustafaev@server.zmustafaev.net>, relay=local, delay=0.01, delays=0/0/0/0, dsn=2.0.0, status=sent (delivered to mailbox)
Dec 17 07:08:57 server postfix/qmgr[14881]: 7F48E47082: removed
```

Рис. 9: Успешная доставка письма с клиента

## Доменная почта: письмо уходит в очередь

```
[zmustafaev@client.zmustafaev.net ~]$  
[zmustafaev@client.zmustafaev.net ~]$ echo . | mail -s test2 zmustafaev@zmustafae  
v.net  
[zmustafaev@client.zmustafaev.net ~]$ postqueue -p  
-Queue ID- --Size-- ----Arrival Time---- -Sender/Recipient-----  
5E796200CB3C      353 Wed Dec 17 07:07:11 zmustafaev@client.zmustafaev.net  
                  (connect to server.zmustafaev.net[192.168.1.1]:25: Connection refused)  
                  zmustafaev@server.zmustafaev.net  
  
-- 0 Kbytes in 1 Request.  
[zmustafaev@client.zmustafaev.net ~]$ █
```

Рис. 10: Отправка письма на доменный адрес и состояние очереди

## DNS: MX и A-записи в прямой зоне

```
zmustafaev.net      [----] 0 L:[ 1+23 24/ 24] *(595 / 595b) <EOF>
$ORIGIN .
$TTL 86400<---->; 1 day
zmustafaev.net<><----->IN SOA<>zmustafaev.net. server.zmustafaev.net. (
<-----><-----><-----><----->2025121506 ; serial
<-----><-----><-----><----->86400      ; refresh (1 day)
<-----><-----><-----><----->3600       ; retry (1 hour)
<-----><-----><-----><----->604800     ; expire (1 week)
<-----><-----><-----><----->10800      ; minimum (3 hours)
<-----><-----><-----><----->)
<-----><-----><----->NS<----->zmustafaev.net.
<-----><-----><----->A<----->192.168.1.1
<-----><-----><----->MX 10<->mail.zmustafaev.net.
$ORIGIN zmustafaev.net.
$TTL 1200<----->; 20 minutes
client<><-----><----->A<----->192.168.1.30
<-----><-----><-----><----->DHCID<->( AAEB/5cdYf+NyJ4KaIPieReH+MLfqRrq9VsWwi4luBN5
<-----><-----><-----><----->i8E= ) ; 1 1 32
$TTL 86400<----->; 1 day
dhcp<-><-----><----->A<----->192.168.1.1
ns<-><-----><----->A<----->192.168.1.1
server<><-----><----->A<----->192.168.1.1
www<-><-----><----->A<----->192.168.1.1
mail<-><-----><----->A<----->192.168.1.1
```

Рис. 11: Файл прямой DNS-зоны с MX-записью

## DNS: обратная зона (PTR)

```
192.168.1 [----] 52 L:[ 1+18 19/ 24] *(549 / 681b) 0010 0x00A
$ORIGIN .
$TTL 86400<---->; 1 day
1.168.192.in-addr.arpa<>IN SOA<>1.168.192.in-addr.arpa. server.zmustafaev.net. (
<-----><-----><-----><----->2025121504 ; serial
<-----><-----><-----><----->86400 ; refresh (1 day)
<-----><-----><-----><----->3600 ; retry (1 hour)
<-----><-----><-----><----->604800 ; expire (1 week)
<-----><-----><-----><----->10800 ; minimum (3 hours)
<-----><-----><-----><----->)
<-----><-----><----->NS<----->1.168.192.in-addr.arpa.
<-----><-----><----->A<----->192.168.1.1
<-----><-----><----->PTR<----->server.zmustafaev.net.
<-----><-----><----->MX 10<----->mail.zmustafaev.net.
$ORIGIN 1.168.192.in-addr.arpa.
1<-----><-----><----->PTR<----->server.zmustafaev.net.
<-----><-----><----->PTR<----->ns.zmustafaev.net.
<-----><-----><----->PTR<----->dhcp.zmustafaev.net.
<-----><-----><----->PTR<----->www.zmustafaev.net.
<-----><-----><----->PTR<----->mail.zmustafaev.net.
$TTL 1200<---->; 20 minutes
30<-----><-----><----->PTR<----->client.zmustafaev.net.
<-----><-----><----->DHCID<-->( AAEB/5cdYf+NyJ4KaiPIeReH+MLfqRrq9VsWwi4luBN5
<-----><-----><-----><----->i8E= ) ; 1 1 32
```

Рис. 12: Файл обратной DNS-зоны



## Postfix: mydestination для домена

```
[root@server.zmustafaev.net ~]#  
[root@server.zmustafaev.net ~]# postconf -e 'mydestination = $myhostname, localhost.$mydomain, localhost, $mydomain'  
[root@server.zmustafaev.net ~]# postfix check  
[root@server.zmustafaev.net ~]# systemctl reload postfix  
[root@server.zmustafaev.net ~]# restorecon -vR /etc  
[root@server.zmustafaev.net ~]# restorecon -vR /var/named/  
[root@server.zmustafaev.net ~]# systemctl restart named  
[root@server.zmustafaev.net ~]#
```

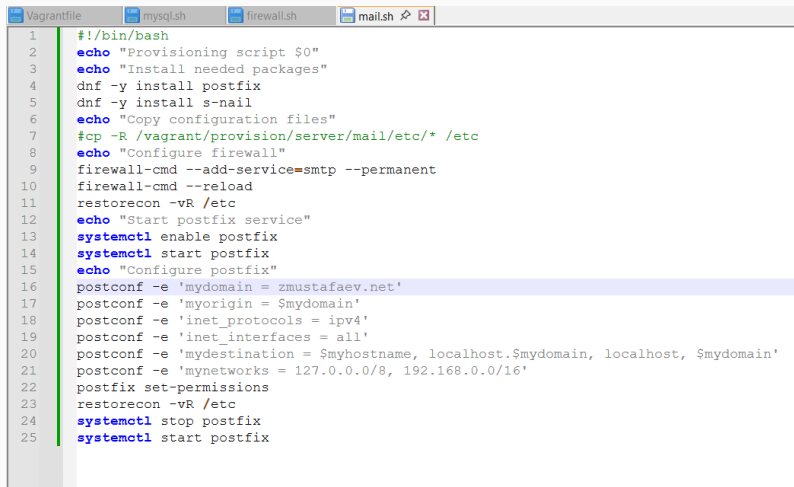
Рис. 13: Изменение параметра mydestination

## Успешная доставка доменной почты

```
Dec 17 07:14:26 server postfix/smtpd[15831]: connect from client.zmustafaev.net[192.168.1.30]  
Dec 17 07:14:26 server postfix/smtpd[15831]: 34D5B4708E: client=client.zmustafaev.net[192.168.1.30]  
Dec 17 07:14:26 server postfix/cleanup[15835]: 34D5B4708E: message-id=<20251217071426.327F3200CB3C@client.zmustafaev.net>  
Dec 17 07:14:26 server postfix/qmgr[15718]: 34D5B4708E: from=<zmustafaev@client.zmustafaev.net>, size=559, nrcpt=1 (queue active)  
Dec 17 07:14:26 server postfix/smtpd[15831]: disconnect from client.zmustafaev.net[192.168.1.30] ehlo=2 starttls=1 mail=1 rcpt=1 data=1  
quit=1 commands=7  
Dec 17 07:14:26 server postfix/local[15836]: 34D5B4708E: to=<zmustafaev@zmustafaev.net>, relay=local, delay=0, delays=0/0/0/0, dsn=2.0.  
0, status=sent (delivered to mailbox)  
Dec 17 07:14:26 server postfix/qmgr[15718]: 34D5B4708E: removed
```

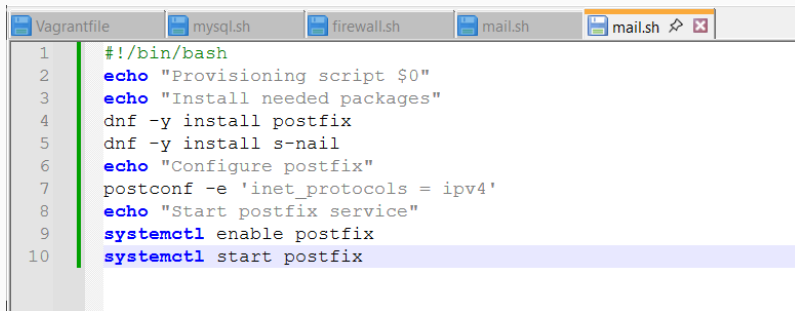
Рис. 14: Успешная доставка доменной почты

## Автоматизация (Vagrant provisioning): server



```
1  #!/bin/bash
2  echo "Provisioning script $0"
3  echo "Install needed packages"
4  dnf -y install postfix
5  dnf -y install s-nail
6  echo "Copy configuration files"
7  #cp -R /vagrant/provision/server/mail/etc/* /etc
8  echo "Configure firewall"
9  firewall-cmd --add-service=smtp --permanent
10 firewall-cmd --reload
11 restorecon -vR /etc
12 echo "Start postfix service"
13 systemctl enable postfix
14 systemctl start postfix
15 echo "Configure postfix"
16 postconf -e 'mydomain = zmustafaev.net'
17 postconf -e 'myorigin = $mydomain'
18 postconf -e 'inet_protocols = ipv4'
19 postconf -e 'inet_interfaces = all'
20 postconf -e 'mydestination = $myhostname, localhost.$mydomain, localhost, $mydomain'
21 postconf -e 'mynetworks = 127.0.0.0/8, 192.168.0.0/16'
22 postfix set-permissions
23 restorecon -vR /etc
24 systemctl stop postfix
25 systemctl start postfix
```

Рис. 15: Скрипт автоматической настройки Postfix на сервере



The screenshot shows a terminal window with a tabbed interface. The active tab is 'mail.sh'. The script content is as follows:

```
1  #!/bin/bash
2  echo "Provisioning script $0"
3  echo "Install needed packages"
4  dnf -y install postfix
5  dnf -y install s-nail
6  echo "Configure postfix"
7  postconf -e 'inet_protocols = ipv4'
8  echo "Start postfix service"
9  systemctl enable postfix
10 systemctl start postfix
```

Рис. 16: Скрипт автоматической настройки Postfix на клиенте

## Выводы

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- Установлен и настроен **Postfix** на сервере и клиенте
- Обеспечена доставка почты:
  - локально на сервере
  - между узлами внутренней сети
  - по доменному имени при корректных DNS-записях (MX/A/PTR) и настройках Postfix
- Подготовлены provisioning-скрипты для воспроизводимого развёртывания