



ОКН

Программная
инженерия

Москва
2026

Семинар №8

Внешний периметр. Сервисы

Основы кибербезопасности
Белявский Д.А.

Проверка доступности (ICMP)

Ping

```
ping
```

```
ping hse.ru
```

```
ping -t 178.248.234.104
```

```
# ping hse.ru
PING hse.ru (178.248.234.104) 56(84) bytes of data.
64 bytes from 178.248.234.104: icmp_seq=1 ttl=59 time=7.71 ms
64 bytes from 178.248.234.104: icmp_seq=2 ttl=59 time=7.37 ms
64 bytes from 178.248.234.104: icmp_seq=3 ttl=59 time=7.38 ms
64 bytes from 178.248.234.104: icmp_seq=4 ttl=59 time=7.48 ms
64 bytes from 178.248.234.104: icmp_seq=5 ttl=59 time=7.45 ms
64 bytes from 178.248.234.104: icmp_seq=6 ttl=59 time=7.35 ms
64 bytes from 178.248.234.104: icmp_seq=7 ttl=59 time=7.43 ms
64 bytes from 178.248.234.104: icmp_seq=8 ttl=59 time=7.39 ms
^C
--- hse.ru ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7010ms
rtt min/avg/max/mdev = 7.350/7.443/7.707/0.107 ms
```

Проверка маршрута до целевого сервиса (ICMP)

Traceroute

```
tracert
```

```
Windows
```

```
tracert bmstu.ru
```

```
traceroute
```

```
Linux
```

```
traceroute -n 89.175.46.249
```

```
# traceroute bmstu.ru
traceroute to bmstu.ru (195.19.34.250), 30 hops max, 60 byte packets
 1 * * *
 2 178.170.222.224 (178.170.222.224) 8.145 ms 8.132 ms 8.122 ms
 3 m9.msk-ix.cloud.yandex.ru (195.208.209.51) 8.119 ms 178.170.222.224 (178.170.222.224) 8.100 ms m9.msk-
ix.cloud.yandex.ru (195.208.209.51) 8.096 ms
 4 m9-cr04-be39.1030.msk.mts-internet.net (212.188.45.240) 8.440 ms as15377.ix.dataix.eu (178.18.226.226) 16.688 ms
runnet.msk.piter-ix.net (185.0.12.202) 8.060 ms
 5 * a197-cr08-eth-trunk7.msk.mts-internet.net (195.34.53.202) 8.958 ms 8.895 ms
 6 391.ae0.gw5.tv11.msk.niks.su (194.190.254.106) 11.419 ms a197-cr02-be2.msk.mts-internet.net (212.188.42.121) 8.704
ms 391.ae0.gw5.tv11.msk.niks.su (194.190.254.106) 9.907 ms
 7 h250.net34.bmstu.ru (195.19.34.250) 9.269 ms !X 9.424 ms !X et111.r1.tv11.msk.niks.su (194.85.42.67) 16.498 ms
```

Проверка домена (DNS)

Nslookup

```
nslookup
```

```
nslookup hse.ru
```

```
nslookup niem.hse.ru
```

Dig

```
dig
```

Linux

```
dig hse.ru
```

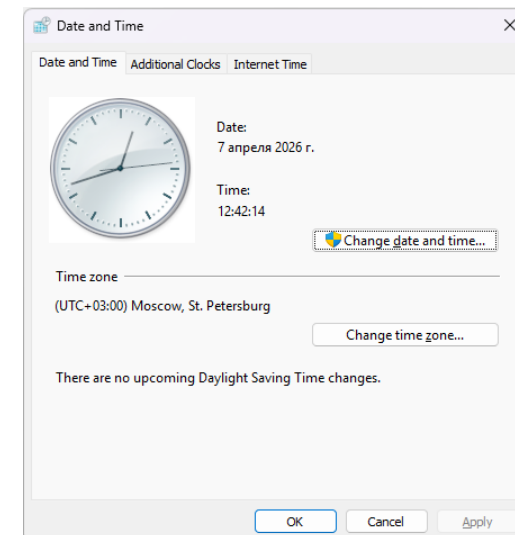
Проверка сервисов (время, NTP)

Time & date

timedatectl

timedate.cpl

```
# timedatectl
Local time: Tue 2026-04-07 09:42:29 UTC
Universal time: Tue 2026-04-07 09:42:29 UTC
RTC time: Tue 2026-04-07 09:42:29
Time zone: Etc/UTC (UTC, +0000)
System clock synchronized: yes
NTP service: active
RTC in local TZ: no
```



Проверка сервисов (сканирование)

NMAP

nmap

Linux

nmap

Windows

```
# nmap cs.hse.ru
Starting Nmap 7.94SVN ( https://nmap.org ) at 2026-04-07 09:49 UTC
Nmap scan report for cs.hse.ru (158.160.178.164)
Host is up (0.0074s latency).
Not shown: 998 filtered tcp ports (no-response)
PORT      STATE SERVICE
80/tcp    open  http
443/tcp   open  https

Nmap done: 1 IP address (1 host up) scanned in 16.96 seconds
```

```
root@ubuntu-02:/home/dmitry# nmap -sV git.cs.hse.ru
Starting Nmap 7.94SVN ( https://nmap.org ) at 2026-04-07 09:49 UTC
Nmap scan report for git.cs.hse.ru (158.160.178.164)
Host is up (0.00054s latency).
Not shown: 996 filtered tcp ports (no-response)
PORT      STATE SERVICE  VERSION
22/tcp    open  ssh      OpenSSH 9.6p1 Ubuntu 3ubuntu13.14 (Ubuntu Linux; protocol 2.0)
80/tcp    open  http     nginx
443/tcp   open  ssl/http nginx
5050/tcp  open  ssl/http nginx
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 16.96 seconds
```

Проверка домена (поисковые системы)

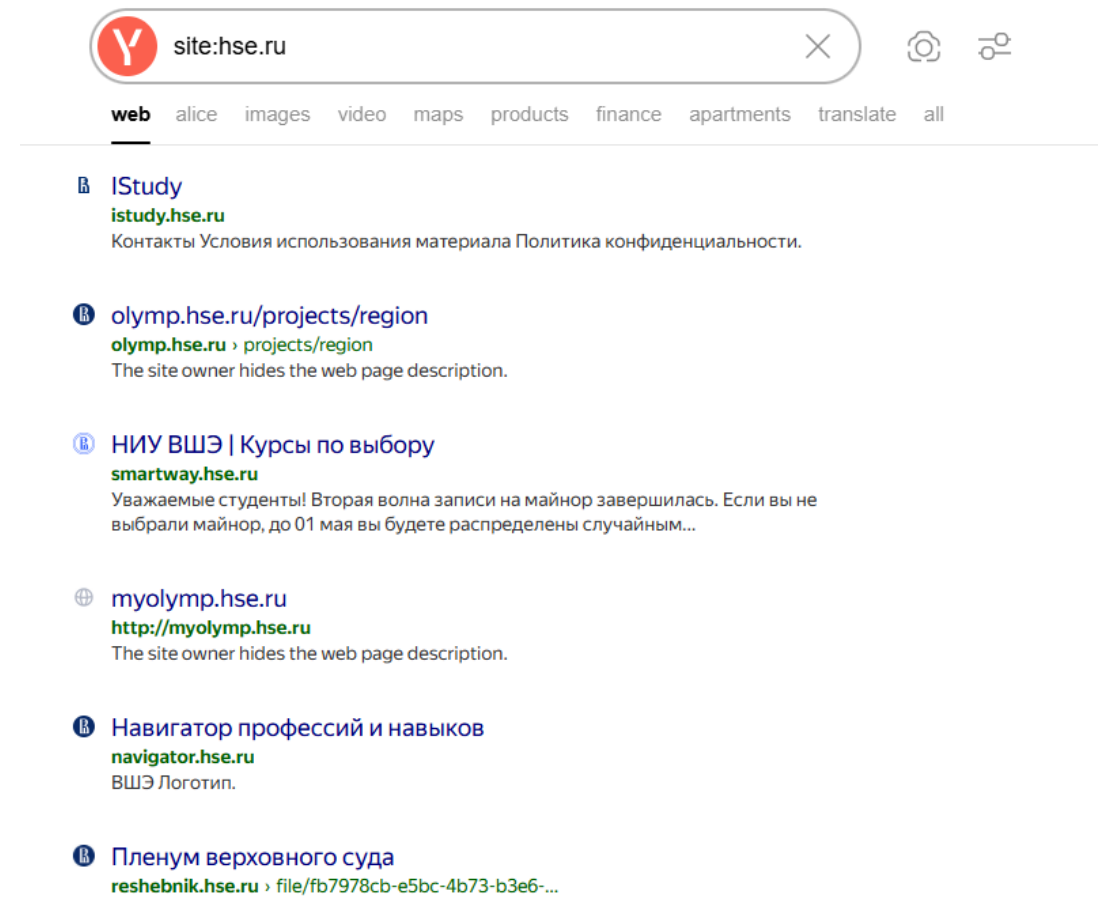
Поисковые системы:

- Яндекс,
- Google,
- Bing,
- DuckDuckGo

В поисковую фразу добавляем:

site:hse.ru

тут может быть любой
другой домен



The screenshot shows a search engine interface with the query 'site:hse.ru' entered in the search bar. Below the search bar, there are several search results listed, each with a small icon, the domain name, and a brief description.

- IStudy**
istudy.hse.ru
Контакты Условия использования материала Политика конфиденциальности.
- olymp.hse.ru/projects/region**
[olymp.hse.ru > projects/region](http://olymp.hse.ru/projects/region)
The site owner hides the web page description.
- НИУ ВШЭ | Курсы по выбору**
smartway.hse.ru
Уважаемые студенты! Вторая волна записи на майнор завершилась. Если вы не выбрали майнор, до 01 мая вы будете распределены случайным...
- myolymp.hse.ru**
<http://myolymp.hse.ru>
The site owner hides the web page description.
- Навигатор профессий и навыков**
navigator.hse.ru
ВШЭ Логотип.
- Пленум верховного суда**
[reshebnik.hse.ru > file/fb7978cb-e5bc-4b73-b3e6-...](http://reshebnik.hse.ru/file/fb7978cb-e5bc-4b73-b3e6-...)

Проверка домена («архивы» доменов)

dnsdumpster.com

2359.hse.ru	89.175.4 6.224	ASN: 8359 89.175.0.0 /16	MTS, RU Russia		14	⋮
25.hse.ru	178.248. 234.104	ASN: 51115 178.248.23 4.0/23	HLL-AS, RU Russia	http: unknown server tech: Modernizr jQuery:1.12.4 OWL Carousel jQuery UI https: QRATOR title: vision cn: .hse.ru tech: jQuery:1.12.4 Modernizr jQuery UI OWL Carousel	518	⋮
30.hse.ru	178.248. 234.104	ASN: 51115 178.248.23 4.0/23	HLL-AS, RU Russia	http: unknown server tech: Modernizr jQuery:1.12.4	518	⋮

Проверка сервисов (онлайн-инструменты)

Центр мониторинга и
управления сетью связи
общего пользования



<https://portal.noc.gov.ru/ru/lookup/>

The screenshot shows the GRCU website interface for checking resources. The header includes the GRCU logo, a search icon, and a menu icon. The main content area features a breadcrumb trail 'Главная / Проверка ресурсов' and a large heading 'Проверка ресурсов'. Below the heading are four buttons: 'MX', 'DNS', 'WHOIS', and 'HTTP', with 'DNS' selected. To the right is a search input field with the text 'Введите домен' and 'hse.ru', and a 'Найти' button. Below the search field, the results for 'DNS: hse.ru' are displayed in a table with columns for 'Тип', 'IP', and 'TTL'.

Тип	IP	TTL
A	178.248.234.104	60

Проверка сервисов (онлайн-инструменты)



mxtoolbox.com

The screenshot displays the MX Toolbox website interface. At the top, there is a navigation bar with the MX TOOLBOX logo and a 'SUPERTOOL' dropdown menu. The main navigation includes links for Pricing, Tools, Delivery Center, Monitoring, Products, Blog, Support, and Login. Below this is a secondary navigation bar with categories: SuperTool, MX Lookup, Blacklists, DMARC, Diagnostics, Email Health, DNS Lookup, Analyze Headers, and All Tools. The main content area is titled 'Network Tools' and features a sub-navigation bar with tabs for All Tools, Email, Network, Website, DNS, NEW!, My Favorite Tools, and Delivery Center. The tools are arranged in a grid, each with an icon, a name, a brief description, an input field, and a play button. The tools shown are: mx (DNS Lookup for MX records), blacklist (Check IP or host), a (DNS Lookup for IP address), smtp (Test mail server SMTP (25)), ptr (DNS reverse lookup), whois (Domain lookup), dns (Check your DNS Servers), spf (Sender Policy Framework), dkim (Domain Keys Identified Mail), dmarc (DMARC Lookup), aaaa (DNS Lookup for IPv6), and srv (DNS Lookup Service Record).

Проверка сервисов (IP адреса и маршрутизация)

 Search

AS8359 MTS PJSC

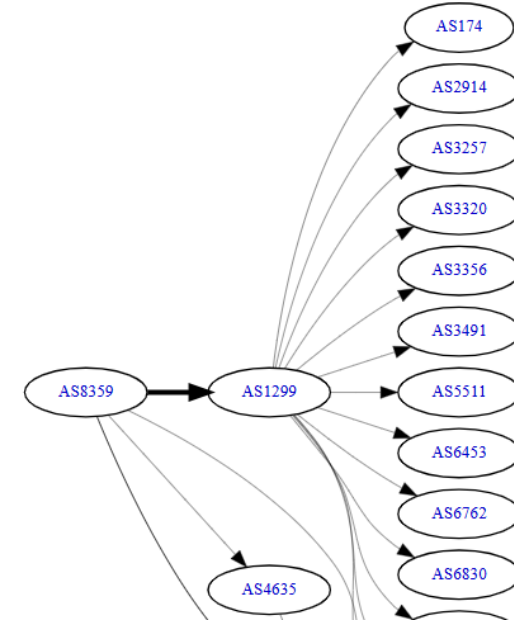
- Quick Links
- AS Info
- Graph v4
- Graph v6
- Prefixes v4
- Prefixes v6
- Peers v4
- Peers v6
- Whois
- RDAP
- IRR
- IX
- Traceroute



<https://bgp.he.net/>

- BGP Toolkit Home
- BGP Prefix Report
- BGP Peer Report
- Super Traceroute
- Super Looking Glass
- Cert Search
- Exchange Report
- Bogon Routes
- World Report
- Multi Origin Routes
- DNS Report
- Top Host Report
- RPKI & ASPA Report
- Internet Statistics
- Looking Glass
- Network Tools App
- IPv6 Certification
- IPv6 Progress
- Contribute Data
- Credits
- Contact Us

AS8359 IPv4 Route Propagation



Проверка сервисов (email)



testconnectivity.microsoft.com

Microsoft Remote Connectivity Analyzer

Get expert guidance for seamless deployment and onboarding with FastTrack. Explore our capabilities [here](#).

Connectivity Tests

- Exchange Online
- Exchange Server
- Microsoft Teams
- Skype for Business
- Copilot

Other Tools

- Message Analyzer
- Network Test
- SfB Server Diagnostic

Search

DNSSEC and DANE Validation Test This test will validate your domain's DNSSEC and DANE configurations using the same DNS resolvers that Exchange Online uses for outbound mail flow.	Exchange Online Custom Domains DNS Connectivity Test This test will check the external domain name settings for your verified domain in Microsoft 365. The test will look for issues with mail delivery such as not receiving incoming email from the Internet and Outlook client connectivity issues that involve connecting to Outlook and Exchange Online.	Exchange ActiveSync This test simulates the steps a mobile device uses to connect to an Exchange server using Exchange ActiveSync.
Synchronization, Notification, Availability, and Automatic Replies These tests walk through many basic Exchange Web Services tasks to confirm they're working. This is useful for IT administrators who want to troubleshoot external access using Entourage EWS or other Web Services clients.	Service Account Access (Developers) This test verifies a service account's ability to access a specified mailbox, create and delete items in it, and access it via Exchange Impersonation. This test is primarily used by application developers to test the ability to access mailboxes with alternate credentials.	Outlook Connectivity This test walks through the steps Outlook uses to connect from the internet. It tests connectivity using both the RPC over HTTP and the MAPI over HTTP protocols.
Inbound SMTP Email This test walks through the steps an Internet email server uses to send inbound SMTP email to your domain.	Outbound SMTP Email This test checks your outbound IP address for certain requirements. This includes Reverse DNS, Sender ID, and RBL checks.	POP Email This test walks through the steps an email client uses to connect to a mailbox using POP3.

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