

CHR in EVE-NG environment for learning/testing purposes

Ihor Hreskiv

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ABOUT ME



IHOR HRESKIV

ihor@mwtc.pl

System administrator and system architect with over 20 years of experience in different kinds of business from government companies to own coworking space in Cracow, Poland

Experience in:
virtualisation (desktop and infrastructure)
linux, bsd systems
networking
routing
vpn





CHR

CHR - What's this?

Cloud Hosted Router

a RouterOS image specifically tailored
for running in virtual environments

CHR - minimal requirements

64-bit CPU with virtualisation support

128 MB RAM for the CHR instance

128 MB disk space for the CHR virtual hard drive

CHR - Supported platforms

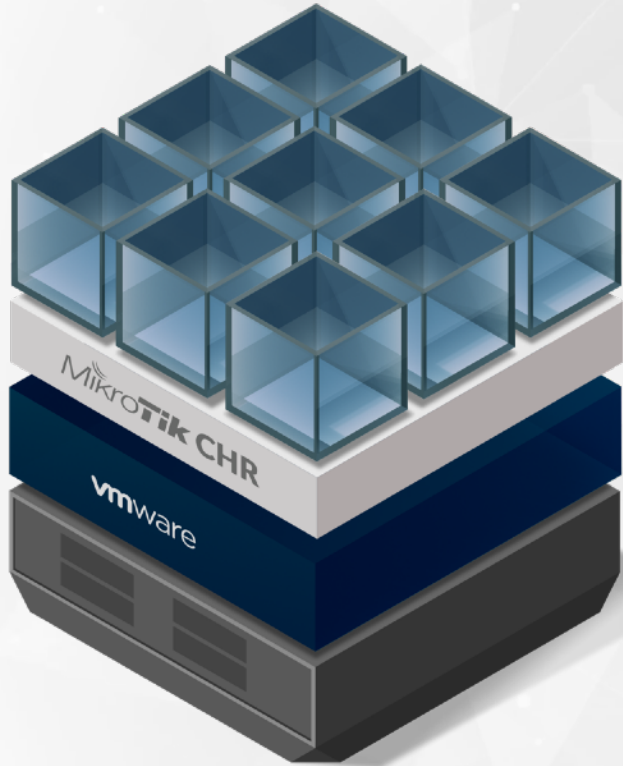
- VMware ESXi/Fusion/Workstation/Player
- Microsoft Hyper-V
- QEMU
- VirtualBox

Hypervisors that provide paravirtualization are not supported!

licensing

| License | Speed limit | Price |
|-------------|-------------|-------|
| Free | 1Mbit | FREE |
| P1 | 1Gbit | \$45 |
| P10 | 10Gbit | \$95 |
| P-Unlimited | Unlimited | \$250 |

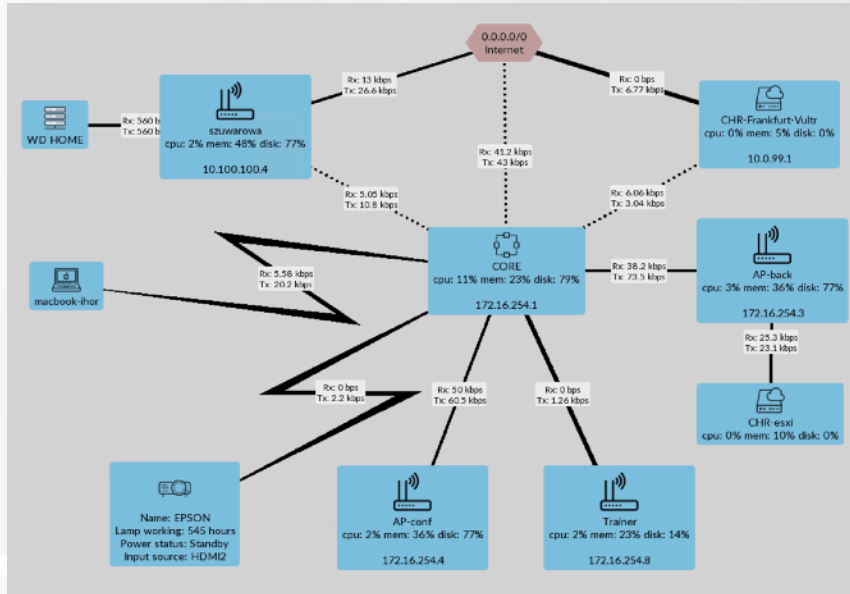
60-day free trial license is available for all paid license levels



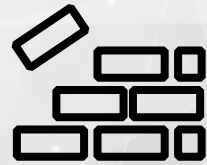
CHR - The Router

- Extends VMware ESXi standard switch functionality
- Adds full featured router for network layer of virtualisation
- Adds VPN and dynamic routing functions for border with advanced firewall

CHR - The Dude

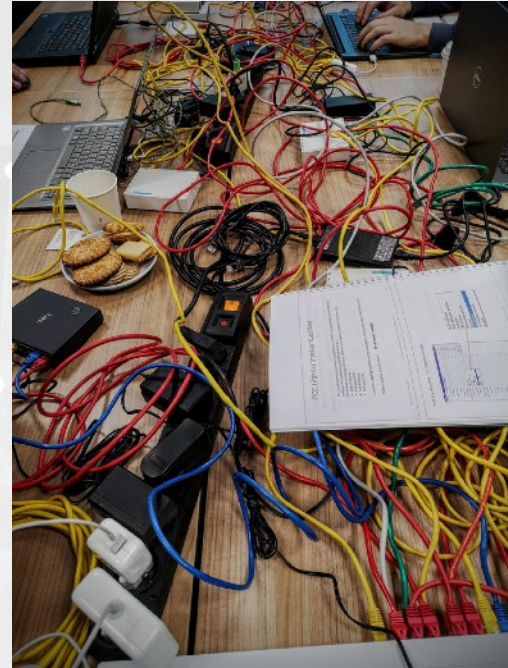


- Bandwidth is enough for monitoring with free license usage
- Can be used as backup monitoring system
- In combination with VPN can monitor remote sites/users



EVE-NG

learning/testing environments



learning/testing environments

vmware®



Microsoft
Hyper-v



GNS3®



Emulated Virtual Environment
Next Generation

eve-ng some features

- KVM HW acceleration
- Topology designer "click and play"
- Labs in xml file format
- Custom Kernel support for L2 protocols
- Memory optimisation (UKSM)
- Full HTML5 User Interface
- Ability to use without additional tools

platforms for eve-ng

- .ova template for hypervisors
- Bare metal installation
- Install on Ubuntu system

comparing versions

| Features/Edition | Community | Professional | Learning center |
|----------------------|------------|----------------|---------------------|
| Price | Free | 99 eur w/o VAT | 99 eur + roles |
| User's role | admin only | admin only | admin, user, editor |
| Lab timer | X | X | V |
| Node limit per lab | 63 | 1024 | 1024 |
| HTML5 Desktop | X | V | V |
| Link quality | X | V | V |
| Multi startup config | X | V | V |
| Advanced design | X | V | V |
| Docker support | X | V | V |

download link for eve-ng community edition



<https://www.eve-ng.net/downloads/eve-ng-2>

integration packs for eve-ng

Windows and Linux systems have the client side, which includes:

- Wireshark
- UltraVNC
- Putty
- necessary wrappers

<https://www.eve-ng.net/downloads/linux-client-side>

<https://www.eve-ng.net/downloads/windows-client-side-pack>

installing CHR in eve-ng

quick deployment from .ova template:



VmWare player



**Microsoft
Hyper-v**

**MS Hyper-V under
Windows 10 Professional**

installing CHR in eve-ng

1. Login into eve-ng host by ssh
2. Download CHR image from **mikrotik.com/download**
3. Create necessary directory, according to docs
4. Unpack and rename **[version].img** file to **hda.qcow2**
5. Move image to previously created directory
6. Fix permissions of the files and directories

installing CHR in eve-ng

Script for install CHR and labs from presentation
are available in GitHub repository

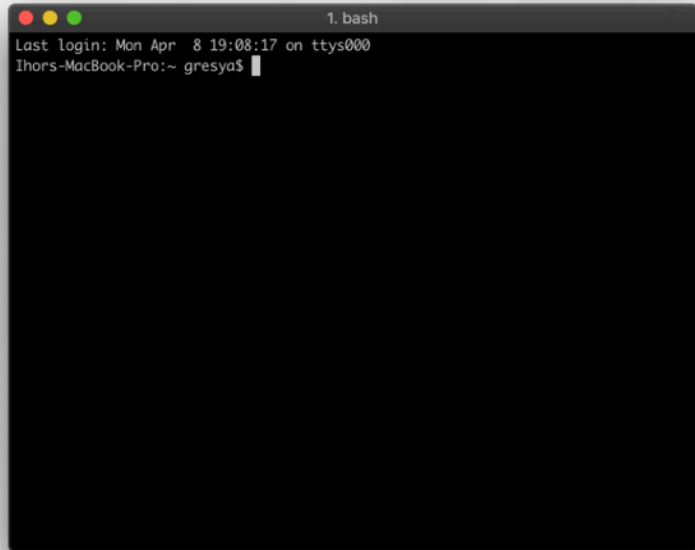
<https://github.com/hreskiv/chr-eve-ng>





QUICK START

starting first project in eve-ng



login to your virtual machine

default credentials:
Username: **root**
Password: **eve**

starting first project in eve-ng

get a copy of script **chr-eve.sh** (*from GitHub*)

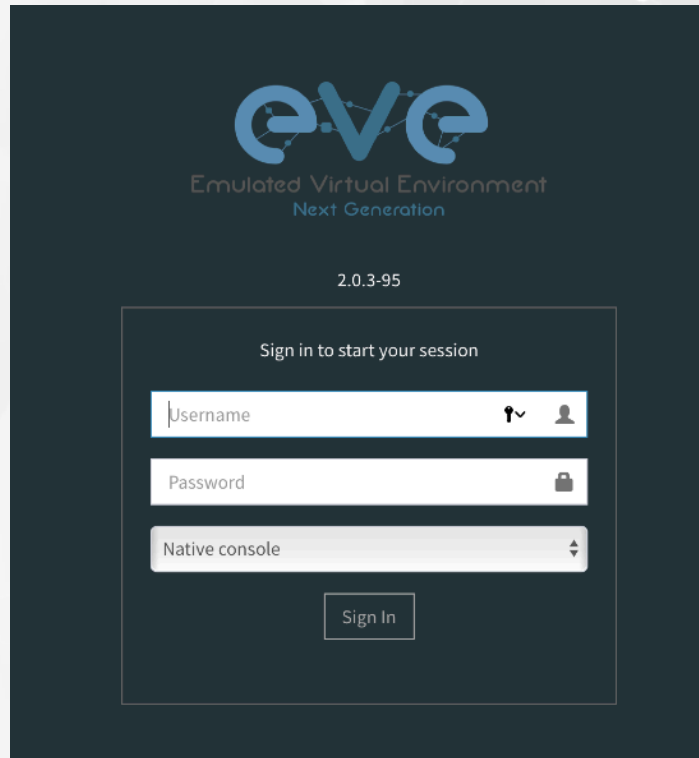
```
wget https://github.com/hreskiv/chr-eve-ng/raw/master/chr-eve.sh
```

simply run a script for adding CHR

```
sh chr-eve.sh 6.44.3
```

next steps will be in your browser

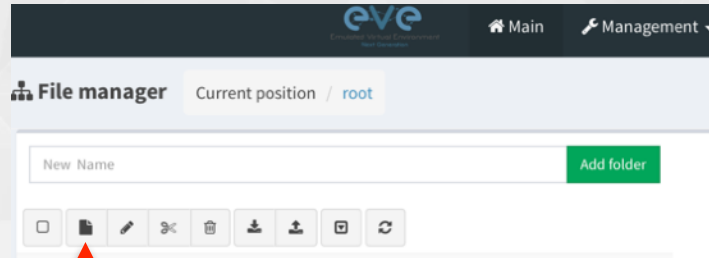
starting first project



`http://[ip.address.of.eve.ng]`

default credentials:
Username: **admin**
Password: **eve**

adding project



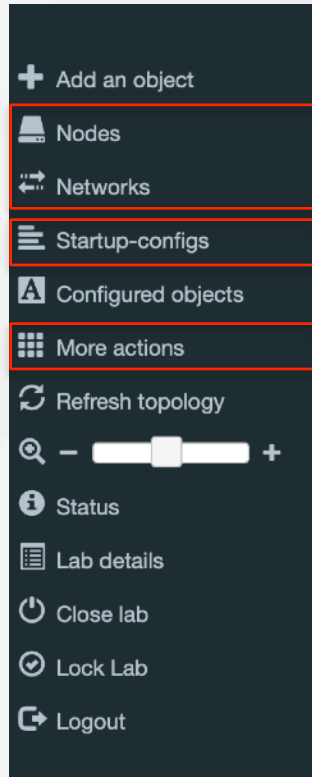
creating new lab button

Add New Lab

| | | | |
|------------------------------|--|--------------------|--|
| Name* | <input type="text" value="Enter Lab's Name"/> name your project <small>Use only [A-Za-z0-9_-]chars</small> | Description | <input type="text" value="Enter description"/> |
| Version* | <input type="text" value="1"/> <small>Must be integer ([0-9]chars)</small> | Tasks | <input type="text" value="Enter tasks"/> |
| Author | <input type="text" value="Enter Author"/> | | |
| Config Script Timeout | <input type="text" value="300"/> Seconds | | |

* - Required Fields

your workbench in eve-ng

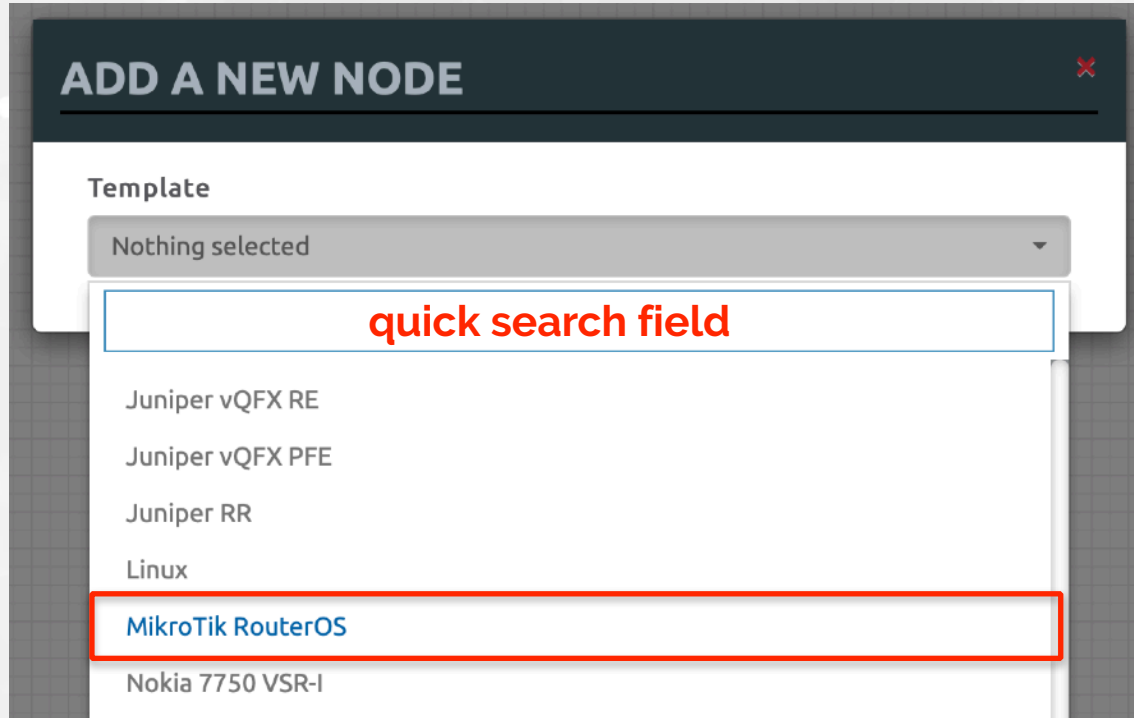


adding nodes/networks

manipulating startup-configs

actions for all nodes like start/stop or wipe

adding node to project



adding node to project

ADD A NEW NODE

Template
MikroTik RouterOS

Number of nodes to add
1

Name/prefix
Mikrotik

Image
mikrotik-6.44.3

choose version of RouterOS*
** you can host multiple versions*

select network cards driver*

** virtio-net-pci consumes less memory*

CPU
1

RAM (MB)
256

Ethernets
4

QEMU Version
tpl(default 2.4.0)

QEMU Arch
tpl(x86_64)

QEMU Nic
tpl(e1000)

QEMU custom options
-machine type=pc-1.0,accel=kvm -serial mon:stdio -nographic

Startup configuration
None

Delay (s)
0

virtio-net-pci

e1000

e1000-82545em

vmxnet3

tpl(e1000)

adding network to project

ADD A NEW NETWORK ✕

Number of networks to add

Name/Prefix

Type

Left

Top


- bridge
- Management(Cloud0) ✓**
- Cloud1

add management network for your project

** you can have more than one*

connecting node and network

ADD CONNECTION BETWEEN NET AND MIKROTIK



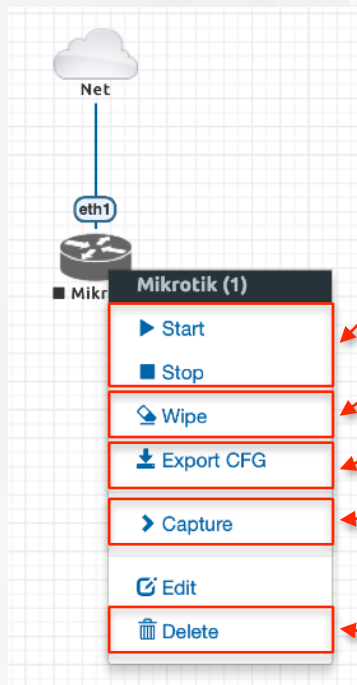
Source ID: 1
Source Name: Net
type - Network

Choose Interface for Mikrotik
eth1

Destination ID: 1
Destination Name: Mikrotik
type - Node

Save Cancel

controls of your VM



start/stop your CHR

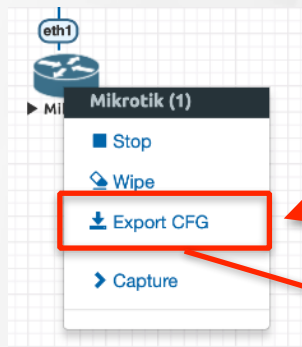
wipe configuration of your CHR

export configuration of your CHR

capture traffic on interfaces of your CHR

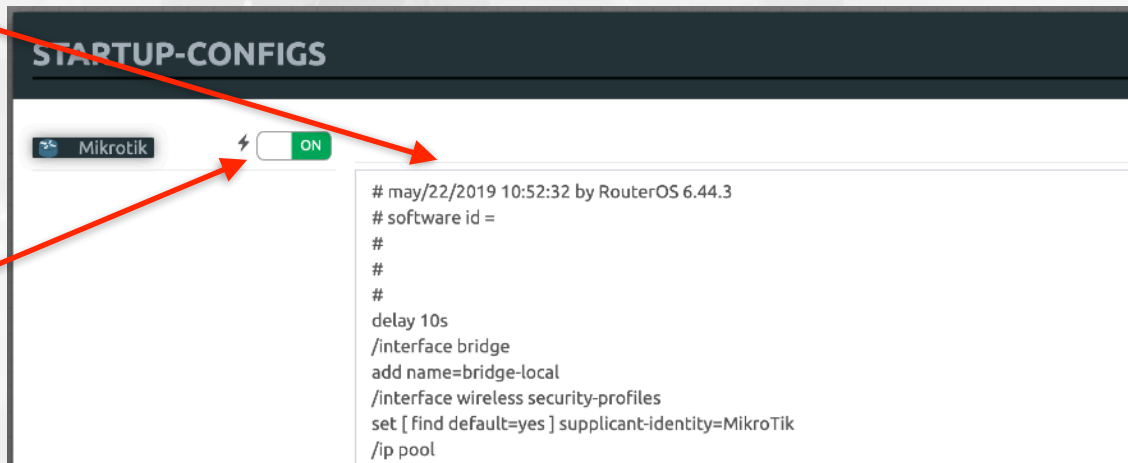
delete your CHR

startup configurations



after clicking Export CFG, you can see and edit in simply text editor configuration of your router

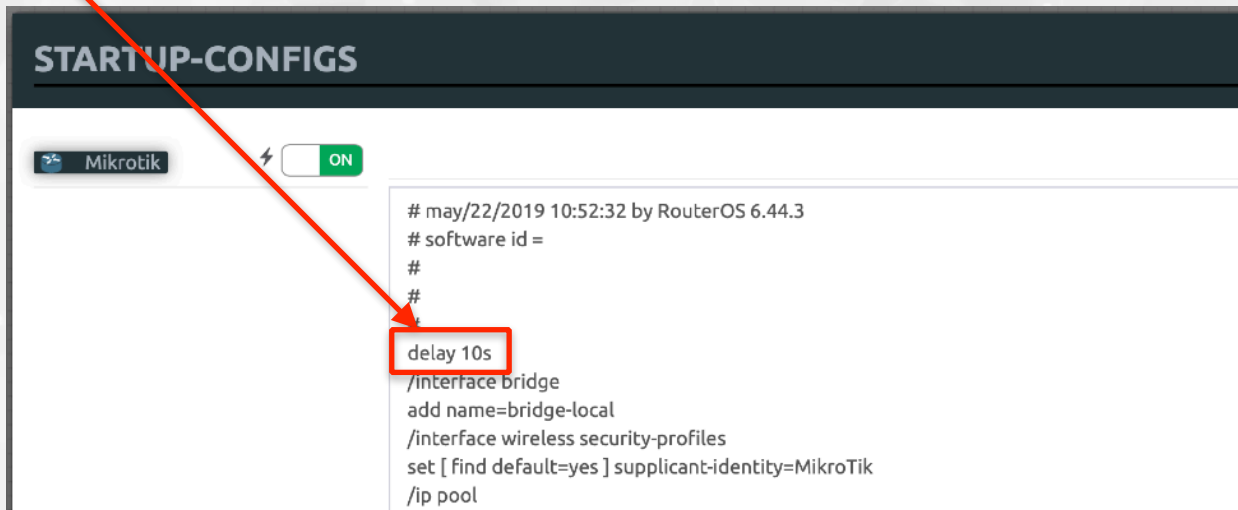
slider ON/OFF allow applying on startup configuration after wiping router



startup configurations

delay 10s

command from router os, give a 10 seconds to router for starting up interfaces*

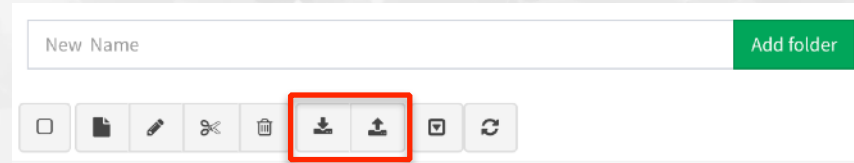


The screenshot shows the Mikrotik 'STARTUP-CONFIGS' interface. At the top, there is a 'Mikrotik' logo and a green 'ON' toggle switch. Below this, a configuration snippet is displayed. The snippet includes the following lines: '# may/22/2019 10:52:32 by RouterOS 6.44.3', '# software id =', '#', '#', and 'delay 10s'. The 'delay 10s' line is highlighted with a red box. Below this, the configuration continues with: '/interface bridge', 'add name=bridge-local', '/interface wireless security-profiles', 'set [find default=yes] supplicant-identity=MikroTik', and '/ip pool'. A red arrow points from the 'delay 10s' text in the text above to the 'delay 10s' line in the screenshot.

```
# may/22/2019 10:52:32 by RouterOS 6.44.3
# software id =
#
#
delay 10s
/interface bridge
add name=bridge-local
/interface wireless security-profiles
set [ find default=yes ] supplicant-identity=MikroTik
/ip pool
```

** 10s is experimental value and you can change it according to your needs*

import/export configurations in eve-ng



import/export buttons allow you transfer your labs between computers with configuration of previously configured routers

DEMO

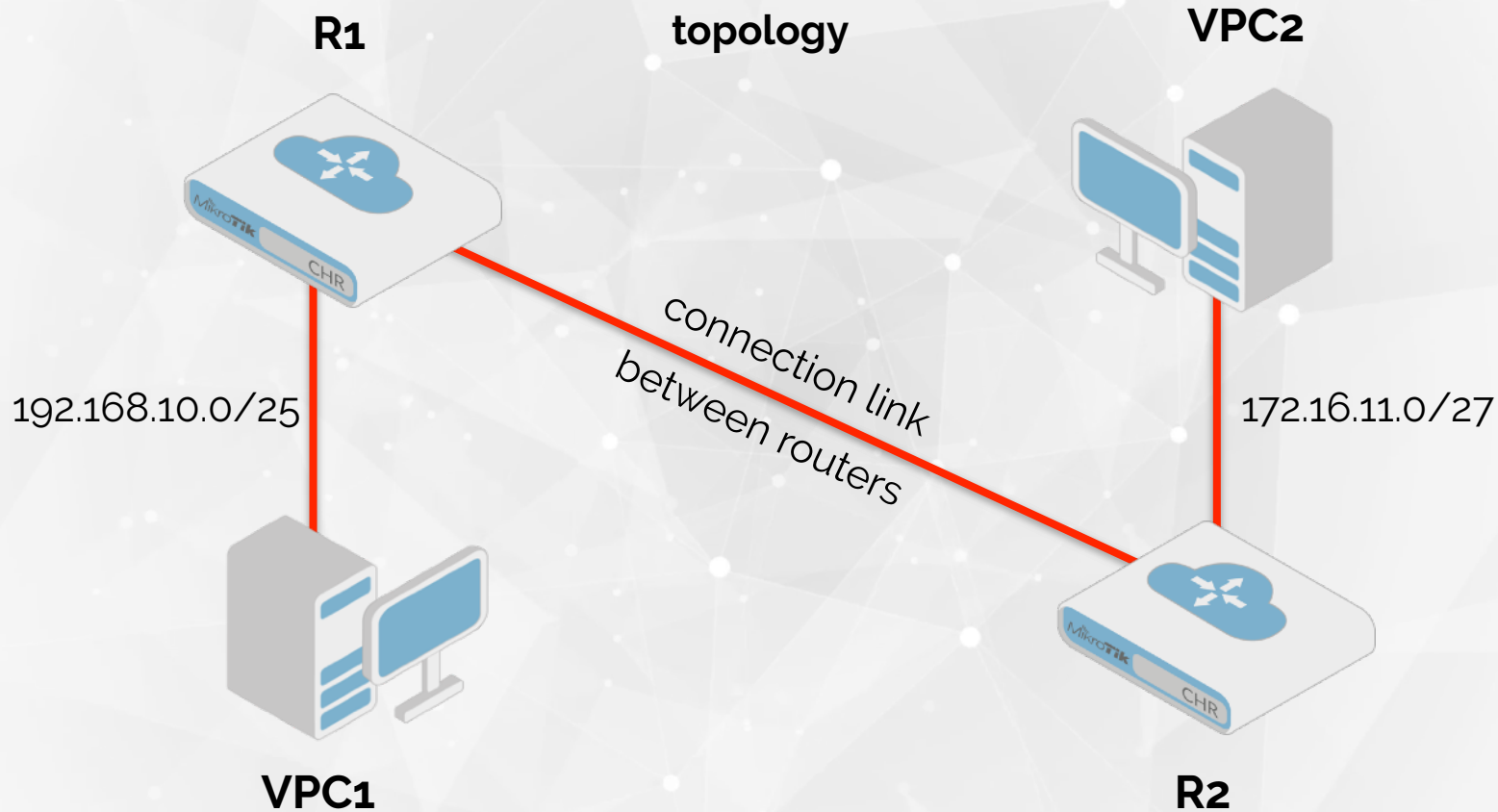


DEMO

let's start from «Hello world»



DEMO 2 - STATIC ROUTING

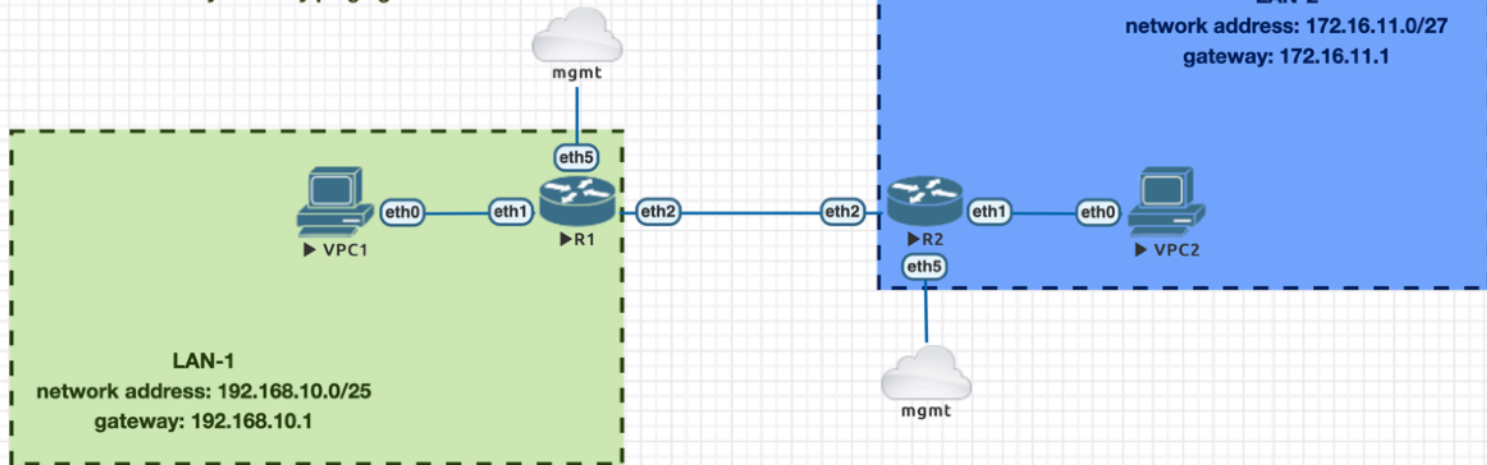


lab in eve-ng

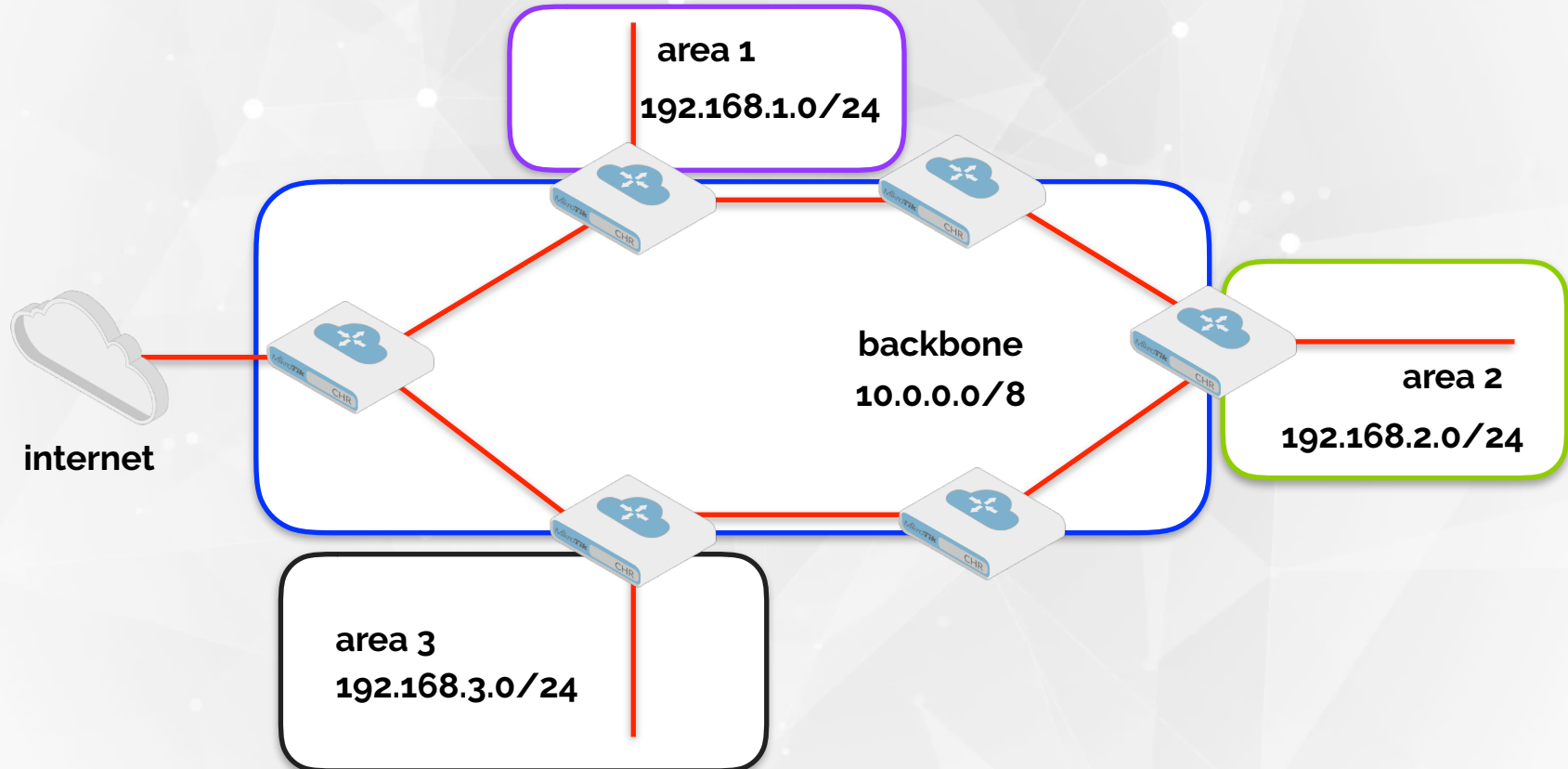
Configure your lab for accessing VPC1 to VPC2 by ping.

Steps to do:

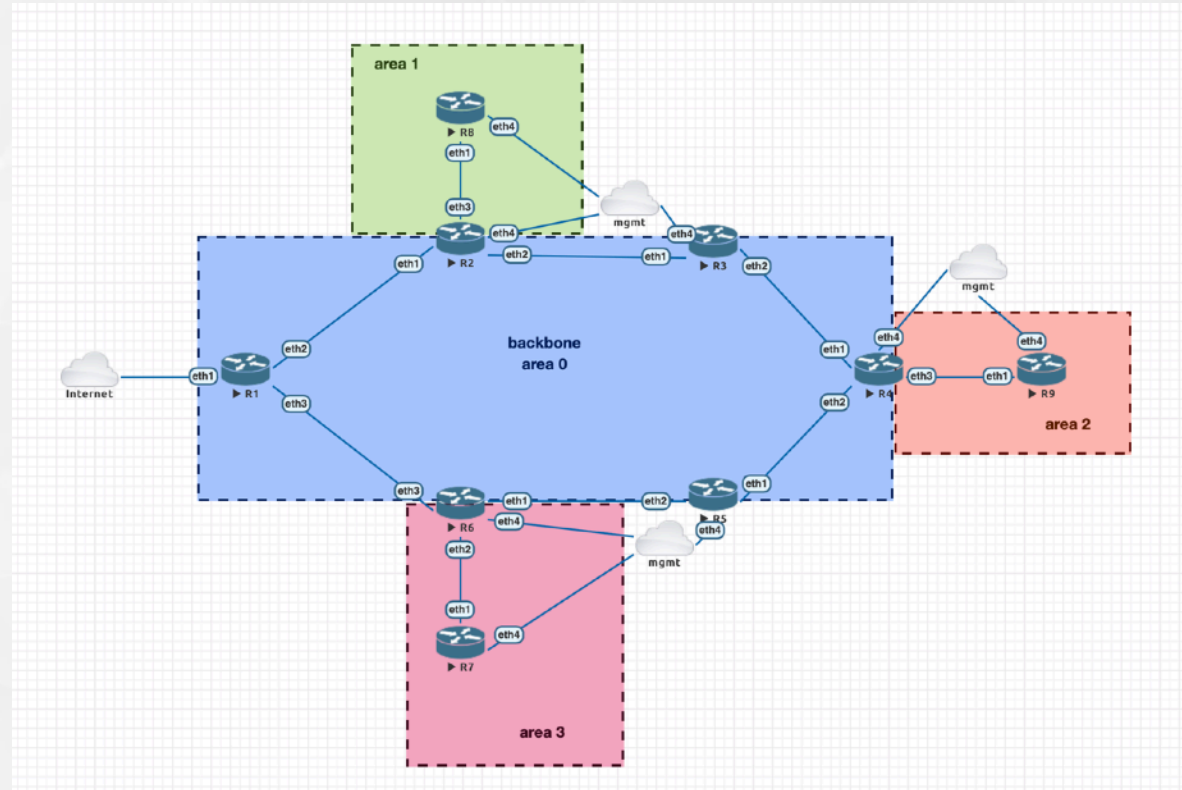
1. Configure DHCP server on both routers
2. Check and write down IP's of VPC's
3. Connect you routers with own selected network
4. Add static routing on both routers for network segments
5. Check availability VPCS by pinging hosts



OSPF multi area topology



OSPF multi area topology



THANK YOU

Questions?



ihor@mwtc.pl

<https://github.com/hreskiv/chr-eve-ng>