

CARNET OAV

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CARNET
znanje povezuje

CARNET Infrastructure

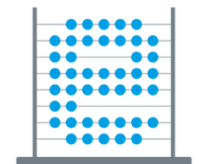


- Private network of Croatian academic, scientific and research community, as well as of institutions of elementary and high school educational system
- Ministry of Science and Education
- Ministry of Health
- Ministry of Demography, Families, Youth and Social Politics
- Ministry of Environmental Protection and Energy
- Croatian Pension Insurance Institute

Overall more than 5000 connected locations

Why we automate?

- Number of connected end-sites: ~5.000
- Growth in connected locations in last 5 years: 25-30% (upgrade from ADSL to optical connectivity, e-Gov, e-Schools)
- E-school project (~1.200 LAN; 30.000 AP+switch)
- National services: DNS, Content filtering for schools, School LAN,
- E-government private network (L3/L2 VPNs)
- Lack of engineers
- Repeatable tasks → script it
- Multiple vendor equipment (specific knowledge)



e-Škole

CARNET

NOC portal/Tools

Turbo Zero Cool

Dobra zaporka

Upiši management IPv4 adresu uređaja, hostname ili naziv providerskog oblaka:

Posljednja pretraga: CN-DC-JASKA-05

Napomena: možeš upisati samo dio hostnamea

- Grejp pretraživanje konfiguracija
- Konfiguracije uređaja

- NFSen
- NDE - raw data

- MegaConf
- MegaTool
- MTK
- MTO

- Za sisteme
- Gdje je bug

- Logovi uređaja
- Što Tko Radi?

- AntIDDOS CTRL Dashboard
- Blokirane adrese - Portscan

- Mikroconf
- Certifikati
- Backups

- Upravljač mrežno nadziranih objekata

- Riorey
- Riorey prefiksi
- Cix peering status

- Ban R
- L1 topologija - ustanove
- L1 topologija - uređaji

- ACL-ovi za ustanove
- CERT timel
- QoS4dummies

- Crna rupa
- Nova crna rupa (@sirius)
- Crni Riorey
- Crni zid

- Krtulator

- Ključić brdo
- Zaporke
- Type 7 decrypt

- Web shell
- Winbox

- McKrt

- Trace Krt
- Nmap mrežni skener
- Censys

- Bandwidth metar
- Linux BWM
- OpenVPN

- Simpatične sitnice
- Riša status
- Ne klikaj!!!

OSPF status:

8

(OSPF susjedstva u ispadu, 0 je normalno)

Upozorenje: korišćenje ovih alata je dobrovoljno i nije obavezno. Ukoliko ih ipak koristiš - činiš to na vlastitu odgovornost!

- Developed internally by CARNET
- Mix of Open Source tools adopted for day-to-day NOC service



Example 1: CPE auto-config

- Configuration for dummies
 - Multi vendor environment
 - Clear and easy to debug configuration
 - Flawless
 - Plug and play – faster deployment of CPE devices
- Auto-import info Network monitoring application
- Auto-inventory serial number management
- MegaConf

Mikroconf - predložak za konfiguracije za MikroTik 2011/3011

Bok Damir!

Naziv ustanove:

Adresa ustanove:

Hostname: [Upute](#)

Javni raspon:

p2p vlanID:

p2p adresa na strani jezgre ili adresa uređaja ukoliko se samo generira certifikat:

Vrsta uplink-a: bakar optika

Description na uplink interface-u:

Broj tiketa u koji ćemo poslati konfiguraciju:

Mikrotik 2011

Visokoškolska ustanova
 HZZO ustanova
 HZMO ustanova

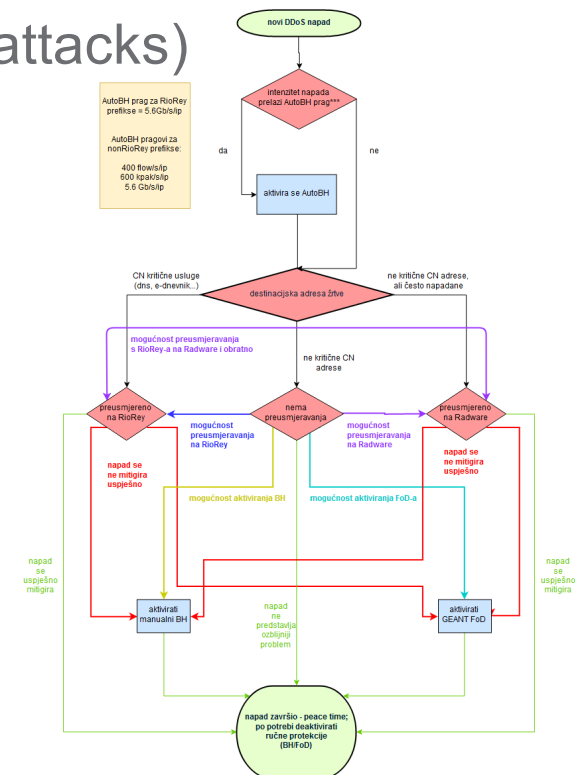
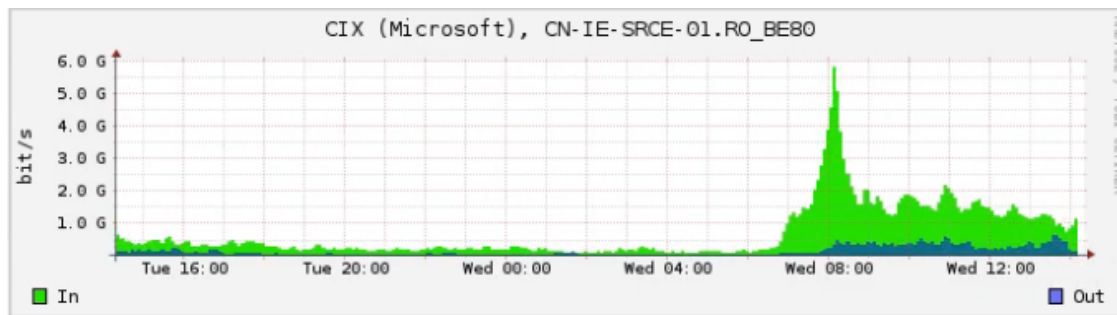
Dodatne ustanove



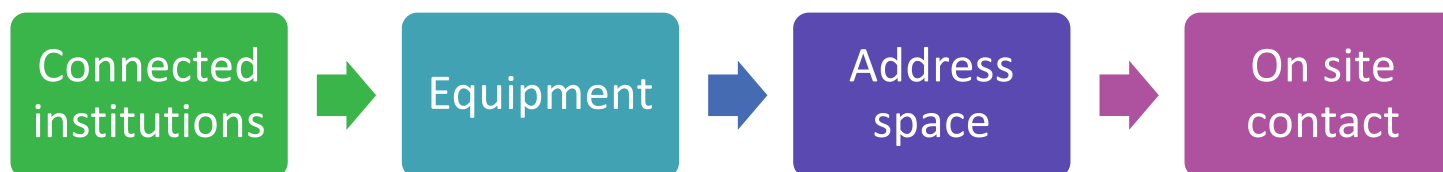
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Example 2: Tools using Netflow as a trigger

- DDoS mitigation
 - Real-time Black-hole (protection against volumetric attacks)
 - Black wall – blacklisting of malware sites
- High traffic via Content Filtering for schools



Example 3: Equipment inventory and IPv4/IPv6 management

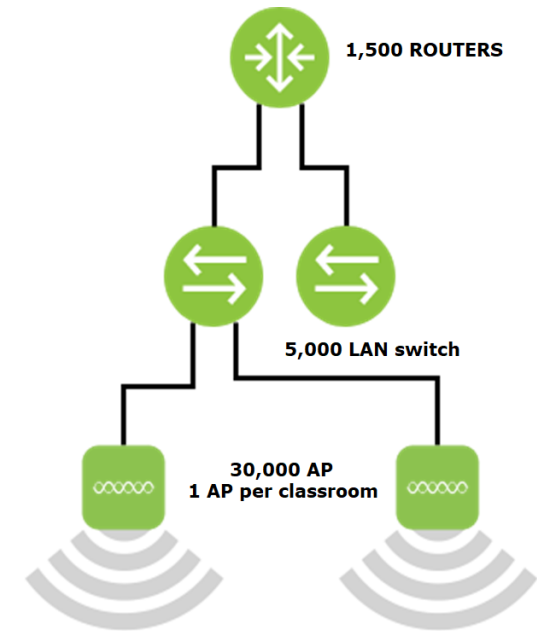


ID	Naziv	Adresa / Mjesto	DGU Adresa / Naselje / Zupanija	RT	IP range	hostname
274	Učiteljski fakultet - Središte u Čakovcu	Starčevićeva 55 / 40000 / Čakovec	ULICA DR. ANTE STARČEVIĆA 55, 40000 Čakovec, Međimurska	#3511	[A] 172.16.64.32 / 30 [A] 172.16.64.40 / 30 [A] 172.20.192.112 / 30 [A] 172.20.193.192 / 30 [A] 172.20.193.196 / 30 [A] 172.20.194.52 / 30 [A] 172.20.200.56 / 32 [A] 172.20.201.114 / 32 [A] 172.20.201.51 / 32 [A] 172.20.201.52 / 32 [R] 193.198.30.0 / 24 [A] 193.198.30.0 / 24 2001:b68:ffff:ff:14aa:: / 128	CN-AGG-CAKOVEC-01.RO Krt Konf Log Zenoss Ping NetFlow Shell Serial Grafana mCN VizL1 Obavijest Smetnja RT → [Otvori] [Otvoreni] [Svi] CN-AGG-CAKOVEC-02.SW Krt Konf Log Zenoss Ping NetFlow Shell Serial Grafana mCN VizL1 Obavijest Smetnja RT → [Otvori] [Otvoreni] [Svi] CN-AGG-CAKOVEC-03.SW Krt Konf Log Zenoss Ping NetFlow Shell Serial Grafana mCN VizL1 Obavijest Smetnja RT → [Otvori] [Otvoreni] [Svi] CN-TS-CAKOVEC-01.RO Krt Konf Log Zenoss Ping NetFlow Shell Serial Grafana mCN VizL1 Obavijest Smetnja RT → [Otvori] [Otvoreni] [Svi] MZOS-VS-CK-CAKOVEC-UPS1 Krt Konf Log Zenoss Ping NetFlow Shell Serial Grafana mCN VizL1 Obavijest Smetnja RT → [Otvori] [Otvoreni] [Svi] MZOS-VS-CK-UCITFAKS-1 Krt Konf Log Zenoss Ping NetFlow Shell Serial Grafana mCN VizL1 Obavijest Smetnja RT → [Otvori] [Otvoreni] [Svi]

E-school LAN management

- Private cloud network services:
 - Wi-Fi network, UTM, Content filtering
- Multi-tenancy → for administration/support on each school
- Network monitoring and provisioning through API
 - School admin perspective -> vendor agnostic
 - Adjusted based on specific needs and based on pilot phase lessons learned – use cases (SIMPLICITY, 1 VIEW OF LAN)
 - Network visibility – client, user, application
 - Analytics, reporting – correlating all available information

**BIGGEST CHALLENGE
FOR 2020**





Q&A

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