



# **NIX.CZ - IXP (r)evolution**

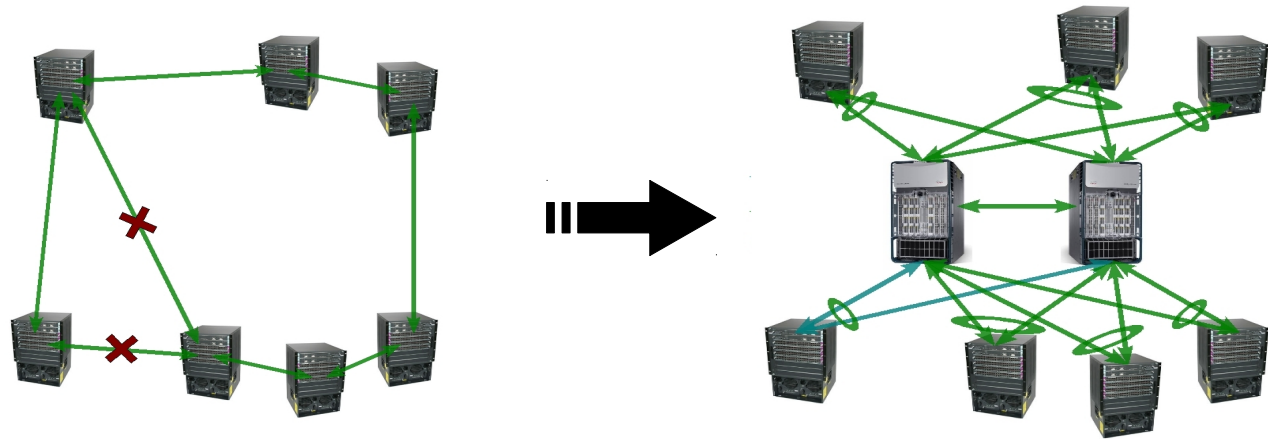
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**RIPE 62 EIX WG**  
**4/5/2011, Amsterdam, NL**

# (R)Evolution steps

**#1 = Topology migration 9/2010 - ring to virtualized dual-star**

(<http://ripe61.ripe.net/presentations/202-NIXCZ-pj-ripe61.pdf>)



**#2 = IPv4 peering segment renumbering - 16/3/2011**

**194.50.100.0/24**



**91.210.16.0/22**



# **NIX.CZ now**

- **4 locations in Prague**
- **Virtualized dual-star L2 infrastructure**
- **7x Cisco 6509E - access switches**
- **2x Cisco Nexus 7010 - core switches**
- **Cisco ONS 15216 - DWDM system**
- **2x route servers BIRD & Quagga**
- **83 members**
- **22 customers**
- **6 TLD operators**
- **168 connected ports**
- **770 Gbps connected capacity**
- **172 Gbps peak traffic**
- **351 Mbps IPv6 peak traffic**



# Renumbering motivation

- About 60% of IPv4 addresses were used
- Bigger address space for future growth

## Our needs and solutions

- We have to renumber -> no possibility to extend netmask
  - Find optimal renumbering process -> liberal or strict process
  - Find optimal coordination process -> right timing
  - These process should be feasible for everyone
  - No impact on IPv6
- 
- We announced this plan to our members on NIX.CZ WGs
  - We did a special members WG to re-addressing issue
  - We took members proposals to build an ideal process
  - We did some configuration migration tests
  - We announced process plans at our mailing lists
  - Recommendation for smooth IPv4 peering addresses migration:
    - Operation of two independent connections to the NIX.CZ
    - Use of NIX.CZ route servers
    - Use of IPv6



# Renumbering process = D-Day

1. Selected date for the renumbering was 16th March 2011 02:00 - 04:00 CET.
  - Selection of strict re-addressing process.
  - D-day date was announced 3 months in advance.
  - At this time is lowest traffic flow in NIX.CZ.
2. Only first 3 bytes of IPv4 address were changed - last byte remained.
  - **194.50.100.3** -> **91.210.16.3** = nix-s.nic.cz
3. 16.3.2011 - 02:00 CET - START
  - Renumbering of route server rs1.nix.cz (**194.50.100.1** -> **91.210.16.1**).
4. 16.3.2011 - 02:00 - 03:00 CET
  - Renumbering of one of the routers with the lowest IPv4 number by an entity with more than one connection (IPv4 addresses). E.g. NIX.CZ **194.50.100.245/24** -> **91.210.16.245/22**. Second router with higher address was renumbered in the next step.
5. 16.3.2011 - 03:00 CET
  - Renumbering of route server rs2.nix.cz (**194.50.100.2** -> **91.210.16.2**).
6. 16.3.2011 - 03:00 - 04:00 CET
  - Renumbering of routers of all entities with only one connection (IPv4 address) and the remaining routers of entities with more than one connection from the step 4.
7. 23.3.2011 00:00 CET - END
  - Applying of ACL to the old IPv4 peering addresses 194.50.100.0/24 on NIX.CZ switches.

**At D-Day were 90% of all peerings renumbered.**



# D-Day support

- NIX.CZ mail and contact support
- NIX.CZ team was on the phone at D-Day (5 calls at night)
- NIX.CZ Intranet support:
  - To facilitate communication and review phases of reconfiguration of individual subjects, was on the NIX.CZ Intranet an interactive table published, where everyone could see the status of counterparties migrations and was able to change own migration state. The table contained the old IPv4 addresses, new IPv4 addresses, contacts of responsible persons for this migration, reverses, ASNs, migration status and buttons for changing the state.

194.50.100.245	91.210.16.245	gw4.nix.cz	6881	NIX.CZ, z.s.p.o.	NIX.CZ Team, +420 272660627, technici@nix.cz, +420 272660628	V konfiguraci	V konfiguraci
Poznámka:				NOTES OK			
194.50.100.246	91.210.16.246	gw2.nix.cz	6881	NIX.CZ, z.s.p.o.	NIX.CZ Team, +420 272660627, technici@nix.cz, +420 272660628	Nepřečíslováno	Nenavázáno
Poznámka:				NOTES OK			
194.50.100.245	91.210.16.245	gw4.nix.cz	6881	NIX.CZ, z.s.p.o.	NIX.CZ Team, +420 272660627, technici@nix.cz, +420 272660628	Přečíslováno	Problém
Poznámka:				Problem reason OK			
194.50.100.246	91.210.16.246	gw2.nix.cz	6881	NIX.CZ, z.s.p.o.	NIX.CZ Team, +420 272660627, technici@nix.cz, +420 272660628	V konfiguraci	Nenavázáno
Poznámka:				NOTES OK			
194.50.100.245	91.210.16.245	gw4.nix.cz	6881	NIX.CZ, z.s.p.o.	NIX.CZ Team, +420 272660627, technici@nix.cz, +420 272660628	Přečíslováno	Navázáno
Poznámka:				NOTES OK			
194.50.100.246	91.210.16.246	gw2.nix.cz	6881	NIX.CZ, z.s.p.o.	NIX.CZ Team, +420 272660627, technici@nix.cz, +420 272660628	Přečíslováno	V konfiguraci
Poznámka:				NOTES OK			
194.50.100.245	91.210.16.245	gw4.nix.cz	6881	NIX.CZ, z.s.p.o.	NIX.CZ Team, +420 272660627, technici@nix.cz, +420 272660628	Přečíslováno	Navázáno
Poznámka:				NOTES OK			
194.50.100.246	91.210.16.246	gw2.nix.cz	6881	NIX.CZ, z.s.p.o.	NIX.CZ Team, +420 272660627, technici@nix.cz, +420 272660628	Přečíslováno	Navázáno
Poznámka:				NOTES OK			

# Other NIX.CZ news

- Initial customer setup fee cancellation (from ~2000€ to 0€)
- Providing of standard transceivers (SR and LR) by NIX.CZ
- NIX.CZ is turning 15 years old this year

## Future plans

- Network evolution for future traffic and members growth
- Route servers benchmark (BIRD, Cisco, OpenBGPd and Quagga)
- New hardware tests (40G / 100G interfaces)
- New feature tests (TRILL, OTV, VPLS, TrustSec)
- New IPv4/6 feature tests (HSRP, Multicast, Mobile, ...)

**Thank you!**

**Questions?**

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