

First Albanian Network Operators Forum (ALNOF)



Montenegro Internet eXchange Point (MIXP) - The experience of a regional IXP

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www.mixp.me



* Content

- MIXP establishing
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* The MIXP establishing

- Montenegro was one of the last countries in Europe without an Internet exchange point
- Agency for Electronic Communications and Postal Services started some activities to promote an IXP building at the end of 2013.
- CIS UoM produced the **Feasibility Study on the Establishment of Internet Exchange Point (IXP) in Montenegro on April 2014.** and validated through many public debates and events.

* The MIXP establishing



- The analysis of profiles of the existing ISPs in Montenegro and potential candidates for the first IXP in Montenegro, as well as the fact that the national, strategic and security reasons take priority over the commercial reasons.
- FS proposed that the academic environment (**University of Montenegro**) supported by the Ministry and the Agency is the optimum solution for establishing the first IXP on **non-profit base**.

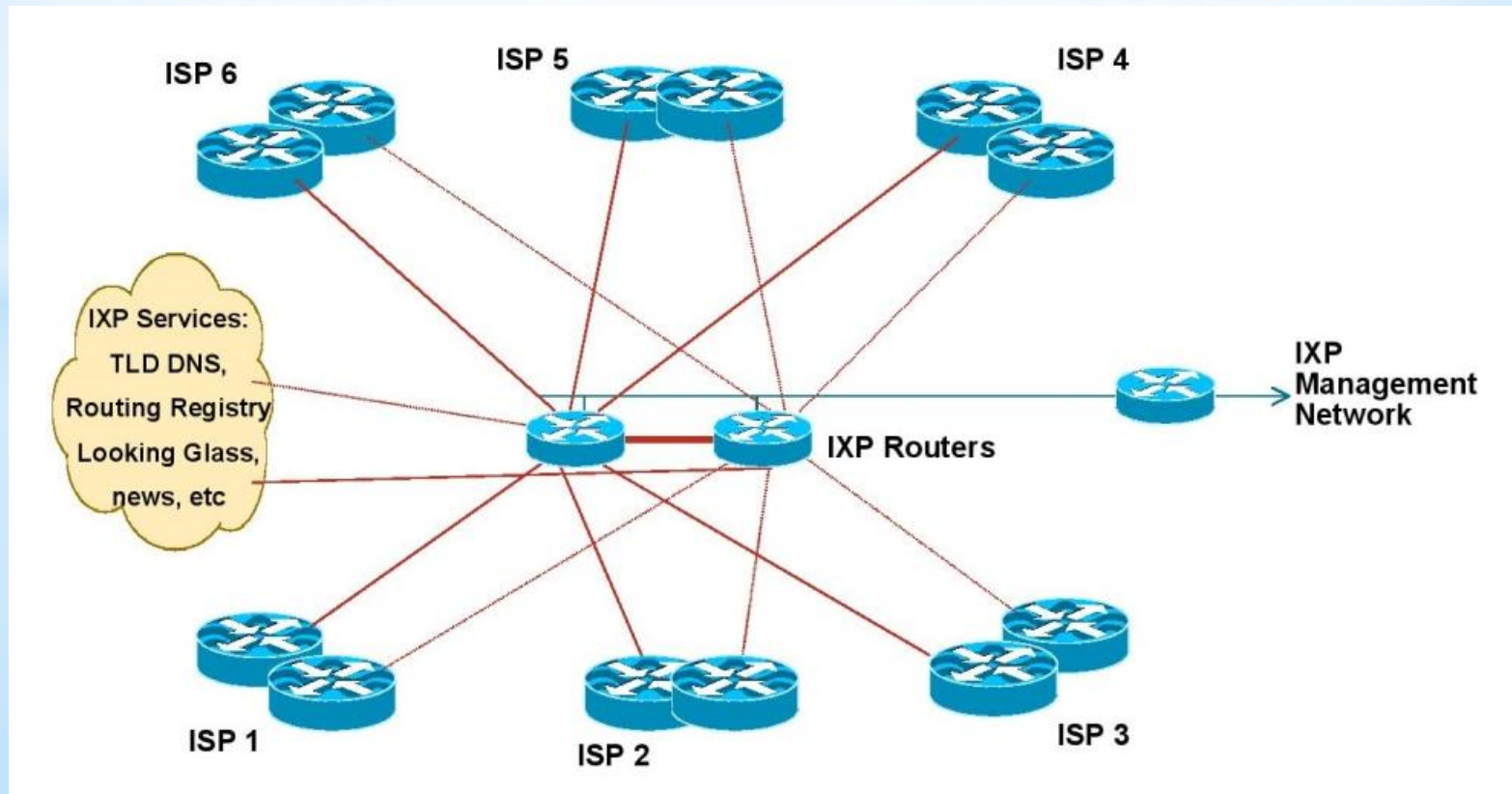
* The MIXP establishing

- Based on FS, the Government has made the Decision at **November 2014.** to make in the CIS UoM the first national IXP.
- The technical team of the **CIS UoM** with **SOX** help has created the detailed **specifications of the equipment and activities necessary for the technical part of installing the IXP.**

* Recommended technical solution



MIXP based on Ethernet, using route-server model, as a separate AS with a unique ASN and IPv4 and IPv6 addresses



* The MIXP establishing

- Since **ISOC** and **ITU** have showed great interest and have expressed the readiness to help on installing the first IXP, we have contacted their representatives and organized a comprehensive **workshop** (part of 20th international scientific conference **IT 2015** in Žabljak) which gave the final design to the IXP.
- The three-day workshop has join together the representatives of **RIPE**, **ICANN**, **France-IX**, **INEX**, **SOX**, **NIX.CZ**, **CISCO**, **CIS UoM**, the **Ministry**, the **Agency** and the **local ISPs**.
- **July 2015** is apointed as the deadline by when the IXP in Montenegro to be established.

* The MIXP establishing

- We had to:
 - Prepare location (CIS data center),
 - Provide required infrastructure (telecommunication, power supply, cooling, ..)
 - Procure the equipment (route server, switches, IXP manager servers, ..)
 - Set-up and configure equipment
 - Make organization structure and rules
 - Promote the IXP (MIXP) and offer services

* The MIXP establishing

- **Telenor and Crnogorski Telekom** have truly made an effort to help on the installation of the first IXP and have agreed to together procure all equipment for MIXP infrastructure.
- **CIS UoM** prepared location in data center and the resources for the implementation of necessary infrastructural changes (the network and power installation) have come from the **ITU** which helping the development of the IXP in Montenegro.
- **Agency for Electronic Communications and Postal Services** support MIXP for staff development and trainings
- **NIX.CZ** provided the training for BGP peering

* The MIXP establishing

- **May 2015.**
 - www.mixp.me
 - RIPE has assigned ASN, IPv4 and IPv6 addresses
- **Jun 2015.**
 - The location has been prepared
 - The equipment has been bring in the place



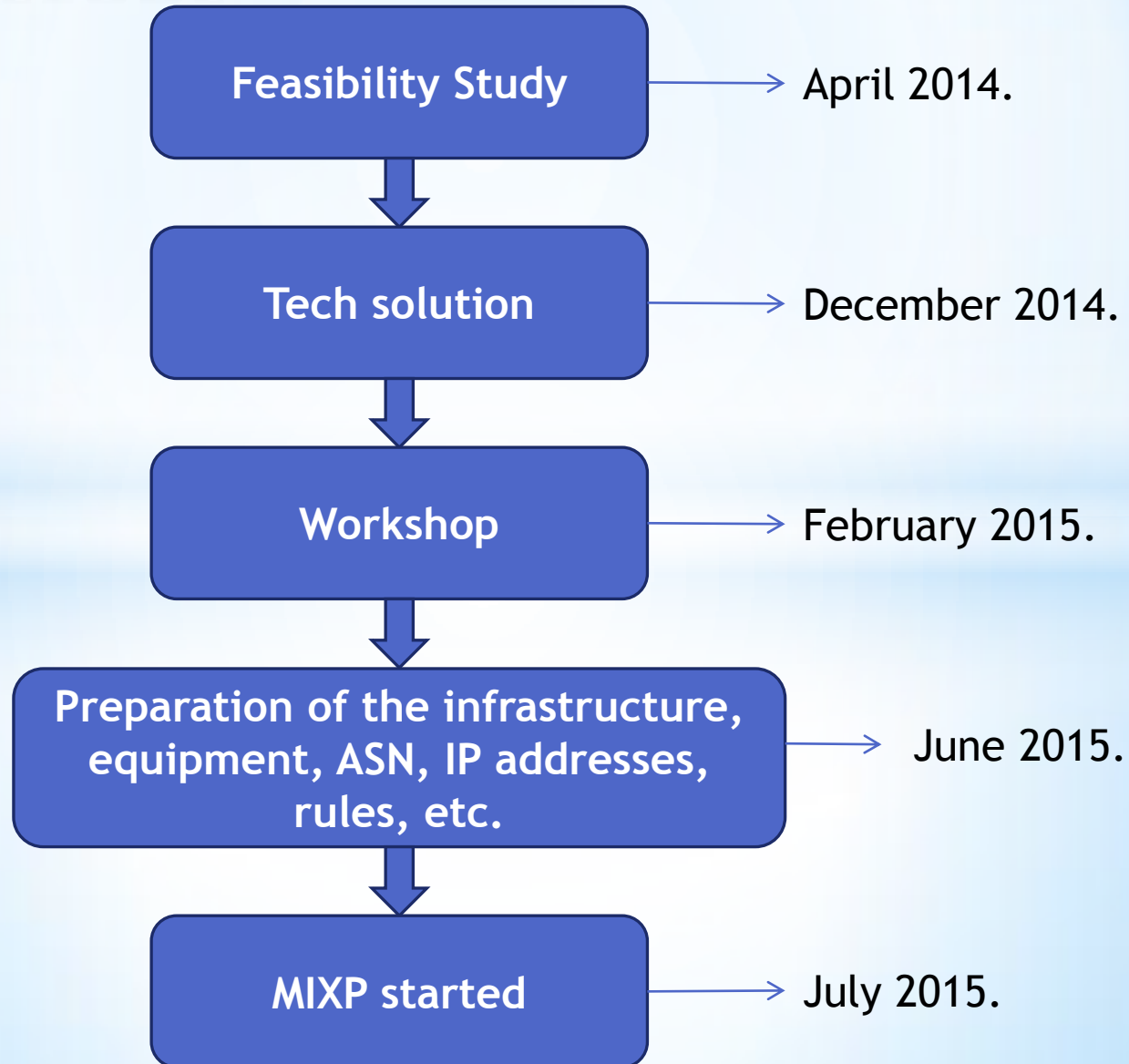
* The MIXP establishing

- **6th July 2015.** - configuration of the MIXP was completed and two ISPs were connected to it (doMen and University of Montenegro).



- The opening ceremony of the MIXP took place on **22.07.2015.**

MIXP steps



* MIXP synergy



- CIS UoM,
- the Ministry,
- the Agency,
- ITU,
- ISOC,
- RIPE,
- ICANN,
- CISCO,
- France-IX,
- INEX, SIX,
- NIX.CZ,
- SOX and
- local ISPs (Telekom CG and Telenor).

* The raising of MIXP

- Promotional work of the MIXP was until **01.01.2016.**
- It was characterized by a promotion of the IXP's functionality and advantages through a call to all ISPs and other legal subjects which fulfill the conditions of connecting to connect to the MIXP and use the services **without the charge.**

* The raising of MIXP

- The government of Montenegro established the advisory board on 21.09.2015.
- The management board of UoM approved MIXP rules and price list, which proposed the advisory board, in December 2015.
- MIXP officily started on **01. 01.2016.**



MIXP - advisory board



The board is composed of representatives from:

- MIXP,
- Agency for Electronic Communications and Postal Services,
- Ministry for Economy and
- Operators (ISPs or MIXP members) using the IXP services.

* MIXP services



- Peering (10/100 Mbps and 1 Gbps)
- Route server (bird with BGP)
- DNS resolving (F-root, 192.5.5.241)
- Looking glass (view routing information)
- Peering matrix (who is interconnected to whom)
- Traffic monitoring (IXP manager)

* MIXP members



- **Connected: UCG, CG Telekom, Telenor, Mtel, MNnews (Top three local ISPs)**
- **Ongoing: The Government network, and Telemach**
- **Negotiation: Orion, ...**

Traffic is growing ...

* The traffic



IXP Manager

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infofest 2016

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IXP CUSTOMER ACTIONS

- Customers
- Interfaces
- Users
- Contacts
- Colocated Equipment
- Meetings

IXP ADMIN ACTIONS

- Infrastructures
- Locations
- Cabinets
- Switches
- IP Addressing
- MAC Addresses
- Vendors
- Console Server

Infrastructure: Aggregate Traffic | Graph Type: Bits | Period: Day

Customer	Graph Type	Period
Crnogorski Telekom	Bits	Day
doMen	Bits	Day
Ministarstvo IDT	Bits	Day
MIXP	Bits	Day
MNNEWS	Bits	Day
Mtel	Bits	Day
Telenor	Bits	Day
UCG - CIS	Bits	Day

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* MIXP - benefits



- Accelerates local internet exchanges between ISPs
- Improve security of local communications
- Reduces latency
- Improves overall bandwidth
- Improves the routing efficiency
- Relieve links for global Internet access,
- Improve the quality of Internet access services
- Help technological start-ups and develop relationships with research and training organizations

* MIXP - risks



- Organization structure
 - Not legal entity
 - Depends on the ministry, the agency and UoM
 - Complex chain of decisions making
- Very few local IP traffic
- Very insufficient local content
- Hosting local content abroad
- Small number of local ISPs

* MIXP - plans

- Connect all local ISPs.
- Establishing an association of MIXP members.
- Introduction of new services.
- Become a member of EURO-IX
- Caching global services and contents most commonly used in the local community within the IXP
- Connecting with the neighboring IXPs
- Connecting with more significant global ISPs

* CONCLUSIONS

- MIXP was established in the right way and thanks to the synergy of the considered participants, but should continue to be developed with the active participation of all stakeholders and trends of ICT development.
- We fully support Albanian Neutral IXP.



** Thank you !*