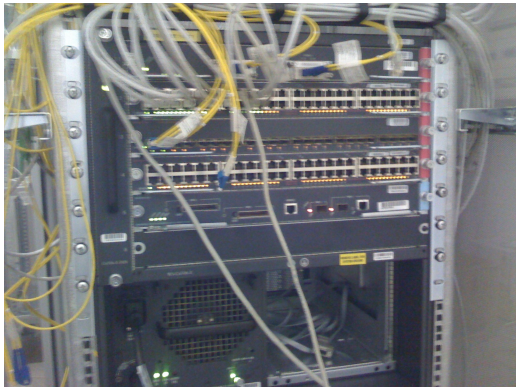
Multicast routing basics with RouterOS

by C4-NetWorks

Overview



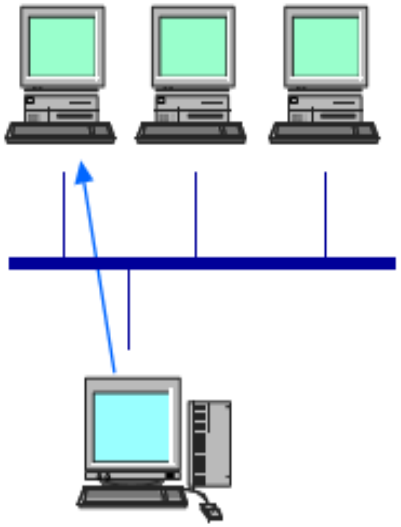
- About our company
- What is multicast?
  - Introduction
  - Unicast vs. Multicast
  - MikroTik and multicast
  - PIM-SM
- Surveillance systems
  - Bandwith is always problem
  - What do you need

About us

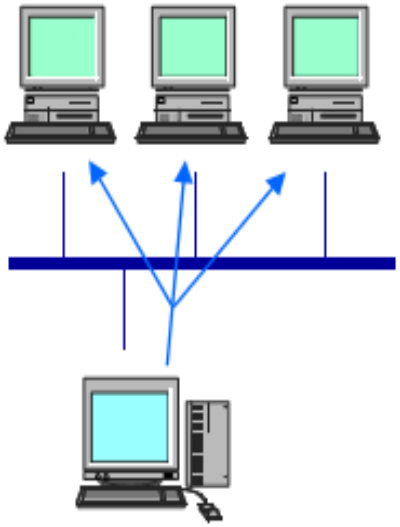
- More than 30 managed ISP networks until now
- Well skilled employees
- Technical Support
- High network building experience
- Custom management solutions
- NOC monitoring hundreds of equipments

Central tower – Seltech Bt

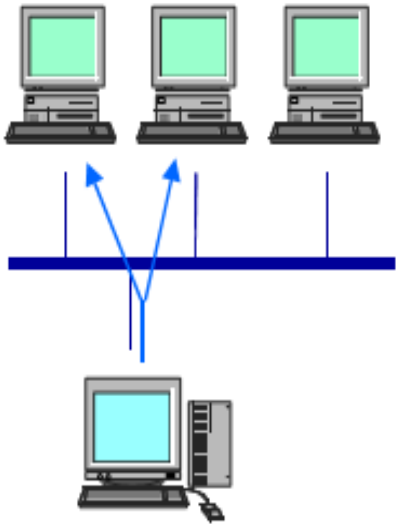
What is multicast?



- Unicast
  - » 1-to-1
- "Anycast"
  - » 1-to-anyone

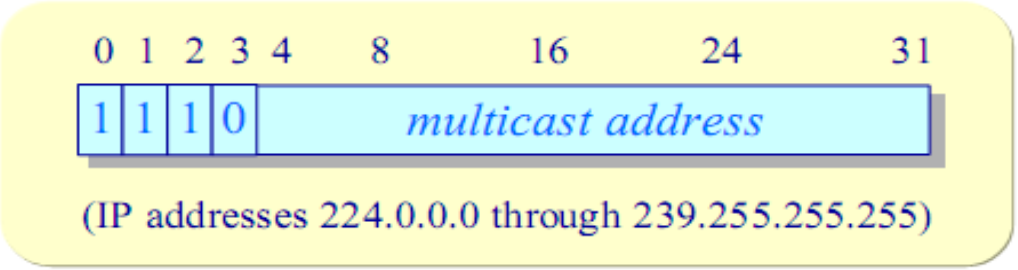


- Broadcast
  - » 1-to-all



- Multicast
  - » 1-to-many

What is multicast?



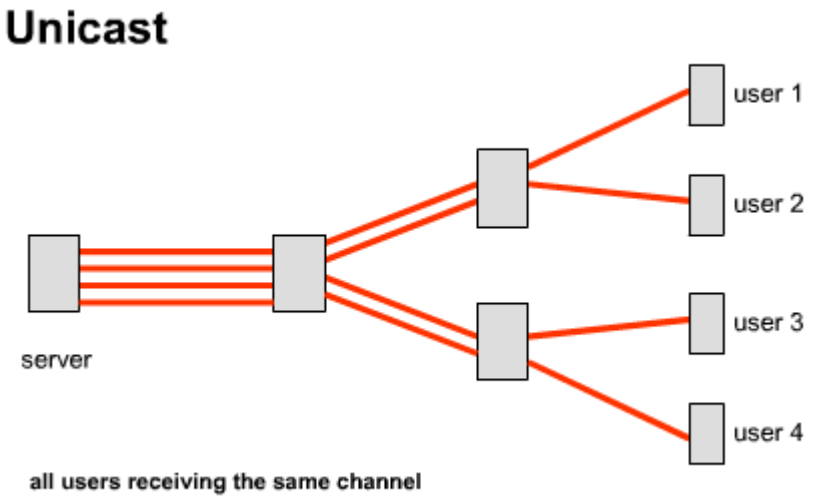
- Multicast addresses can **only** be used as a **destination address**
- Multicast addresses correspond to a multicast group
- Special group addresses
  - Local/Link-level scope
    - v 224.0.0.0 - reserved
    - v 224.0.0.1 - all hosts group, all multicast capable hosts & routers
    - v 224.0.0.2 - all routers group, multicast capable routers only
    - v 224.0.0.5,6 - OSPF routers
    - …
    - 239.0.0.0/8 - it may be used by anyone, without concern for address collisions, for private multicast domains

What is multicast?

- Groups may be of any size
- Group members may be located anywhere in the Internet
- Hosts can join and leave groups at will
- There is no “list” of group members
- A sender cannot tell who (or if anyone) received any message
- Senders need **not** be members of the group
- Group membership (IGMP)
  - Hosts can **join** and **leave** groups dynamically
  - Local multicast **routers** periodically poll hosts for group membership via host membership **query messages**
  - L2 querier/L3 Mrouter

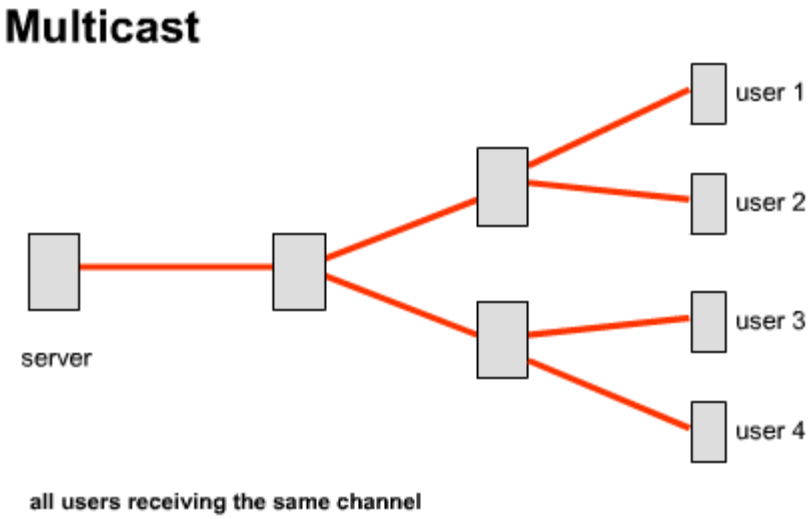
Unicast vs. Multicast

- Unicast modell:
  - Every client (viewer) needs separate stream (client no. x 2Mbit)
  - Bandwith, and computing capacity problem
  - Applyes to small networks



Unicast vs. Multicast

- Multicast modell: 1 source, any number of recevier
  - Multicast saves us bandwith on whole network (stream x 2Mbit)
  - Switches (L2) does not support IGMP snooping, flooding multicast packets on every port even user doesn’ t want it.



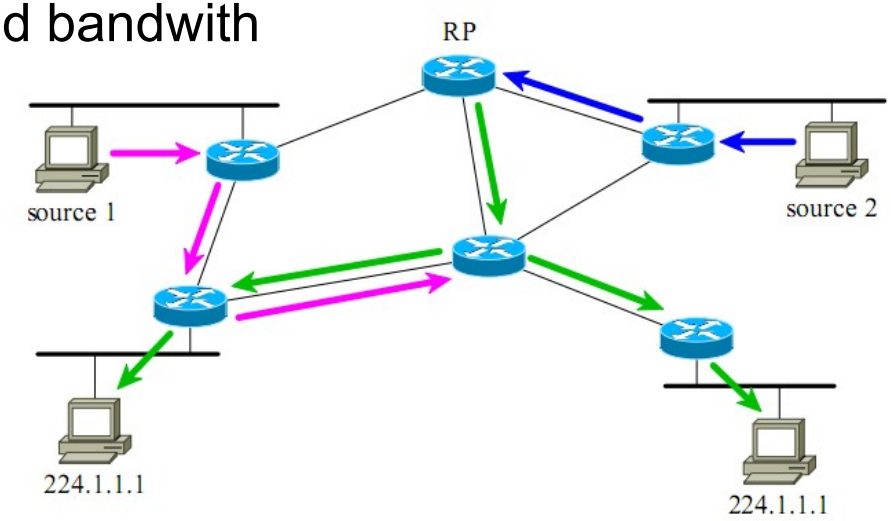
MikroTik and multicast

- Bridged network (ROS)
  - Filter unwanted multicast traffic (bridge filter)
  - Seperate multicast „channels” (EOIP, IPIP, MPLS etc.)
  - Best way: route multicast channels (PIM-SM!)

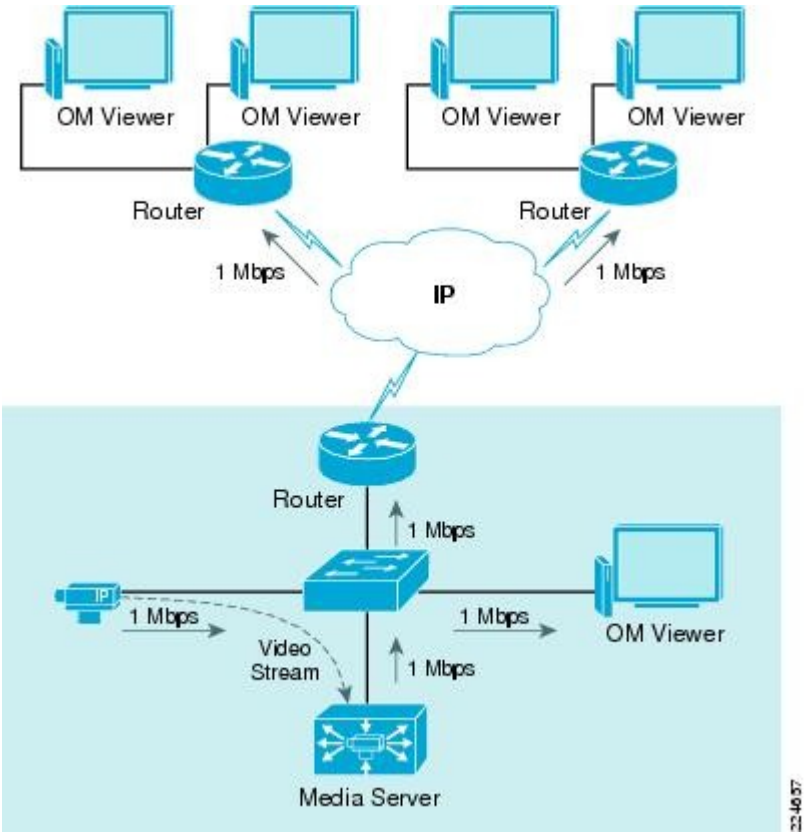
- MikroTik does multicast routing! (Since end of 2008, ROS 3.0)
  - Separate package: multicast (depend on system only)
  - Supports PIM-SM, IGMP proxy (great!)
  - **There is no limitation on number of multicast interfaces, like Linux and other Linux based devies has! (since 4.6)**
  - Compatible with other vendors like Cisco, MRV etc.

MikroTik and multicast

- PIM-SM (Protocol Independent Multicast – Sparse Mode)
- Works with RP (Rendezvous Point)
  - Every PIM enabled network has at least one
  - RP helps members to find each other (Manages PIM routing)
  - Static or dinamic configuration (PIMv2 bootstrap, Cisco auto-RP)
- SPT switchover
  - RP maybe too far or has limited bandwith



Surveillance systems



Surveillance systems

- Main problem is always bandwith
  - 1 camera stream have to go to at least 2 endpoint (NVR, Client)

Let's calc:
Unicast modell:
10 camera (2Mbit stream each) = 20 Mbit (NVR) + ? x2M Client
At least 6Mbit connection/camera (1xNVR + 2xClient)

Multicast modell:
10 camera (2Mbit stream each) = 20 Mbit no more!
2-2,5 Mbit/camera enough!

Surveillance systems

- What network hardware you need?
  - MikroTik wired/wireless routers as Mrouter (RB1000,RB800)
  - Some IGMP Snooping capable switch maybe (C2960)
  - Multicast enabled cameras/encoders
  - Multicast video client (VLC is a great software!), NVR

Thank You!

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