

Ulf Vinneras Cisco Systems
Metro Ethernet Business & Technical
Summit Summit



Cisco.com


110 tv channels to 100 000 users

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Cisco Systems

Metro Ethernet

What is metro ethernet

Cisco.com



Objective of bringing Ethernet in the First Mile is to deliver **data, voice, video** over a simple and inexpensive **Ethernet** network.

Naturally a Metro ethernet network is also **combined** with **xDSL** services, to cover bigger areas. Everything described in this presentation is **also applicable** in a **xDSL environment**

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Agenda

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What is multicast, why?

Security in pay tv broadcasting

Experience of small/large scale multicast

Unresolved issues, future...

Metro Ethernet

Agenda

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What is multicast, why?

Security in pay tv broadcasting

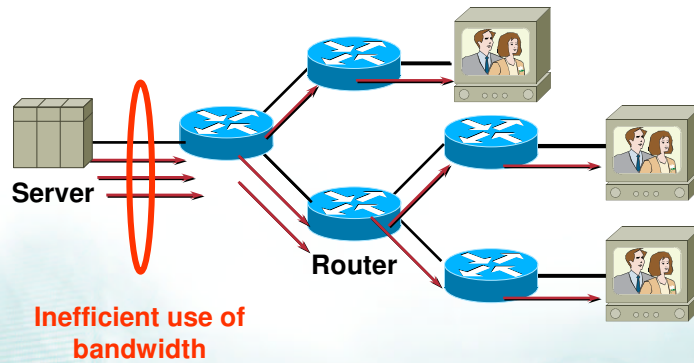
Experience of small/large scale multicast

Unresolved issues, future...

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What is multicast, Unicast function

Cisco.com



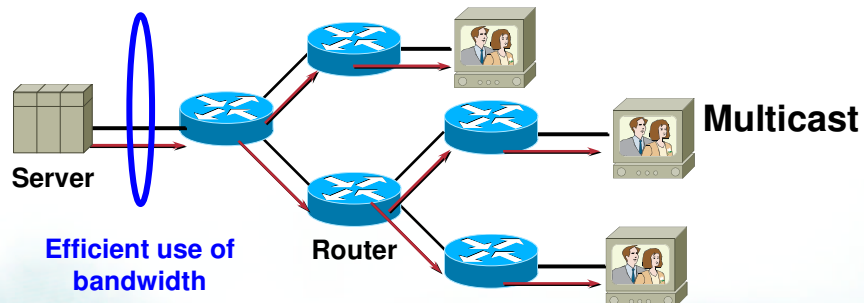
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What is multicast, multicast function

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For multicast distribution the ip address range of
224.0.0.0-239.255.255.255 has been allocated

- 224.x.x.x reserved for protocols
- 239.x.x.x identified as a "local domain" range

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Today on Internet, Radio/tv channel distribution

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- What if this would be the Swedish part of the Internet instead of 5 routers?
- 50 000 people want to listen to/look at the same channel, and that channel is 4 Mb
- **Even if that channel is only 50kb/s, it means we will waste 2,5 Gb... (20 kb/s over 1Gb/s)**
- **What does this mean for the streaming server...**

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Today on Internet, Radio/tv channel distribution

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The two scenarios

- Multicast within one network (one Service provider/network provider) **pay-tv channels**
- Multicast over the Internet, **free tv, radio**



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Pay per view/pay tv security

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- In the legacy cable tv / digital tv network, there is a problem today with people using “smart-cards” to watch channels they haven’t paid for
- As soon as we rely on the security in a box that the customer has control over (placed in the customers home) there will be a hacking risk

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Pay per view/pay tv security, igmp filtering

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- In the metro ethernet environment we have the possibility to create igmp filters per port
- This gives us the possibility to turn on/off multicast channels per group/per port
- This is all done using SNMP set (which makes it very easy for the service/network provider to integrate it in to their existing management / provisioning systems)

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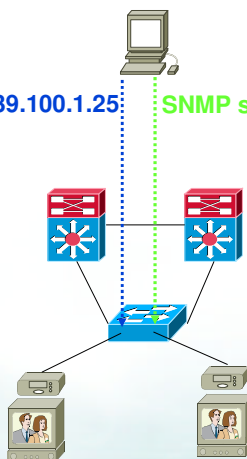
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Pay per view security, igmp filtering

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SNMP set allow 239.100.1.25:

SNMP set allow 239.100.1.1



<http://www.cisco.com/univercd/cc/td/doc/product/lan/cat2950/1219ea1/scg/swigmp.htm#xtocid21>

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Small scale experience

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Lyse power utility in Norway

- Metro Ethernet network with 1000 customers
- Offering a tv service using a set-top-box
- Relying on PIM sparse mode and IGMPv2
- In the Lyse implementation, there are 40 tv channels available to their subscribers
- Channel swap time is below one second

<https://www.lyse.no/produkter/bredband/produkter/>

http://newsroom.cisco.com/dlls/prod_091302.html

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Large scale experience

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Fast Web in Italy

- **Metro Ethernet network with +200 000 internet customers**
- **Offering a tv service using a set-top-box (since year 2000)**
- **Relying on PIM sparse mode and IGMPv2**
- **In the Fast Web implementation, there are 80 tv channels available to their subscribers (another 40 configured)**
- **Channel swap time is below one second**

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Fastweb – Set Top Box

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- **DVD player**
- **Video On Demand “decoder”**
- **“mini-PC” for Internet surfing & E-mail client**

**ALL IN
ONE BOX
Connected to TV**



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Still to be resolved...

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Definition of today's implementation of multicast

If you send to group address, all members receive it

You must be a "member" of a group to receive it's data

You do not have to be a member of a group to send to a group!!!

What if you are running a multicasted tv/radio service, and every customer were able to interfere with the content!

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Still to be resolved...

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Today's implementation of multicast, secured

Today's implementation of Multicast is secured against other people interfering with the content, but there are **no support in the standard for this**

For today's implementation in existing networks, Cisco have a proprietary solution, MVR (Multicast Vlan Registration)

MVR:

http://www.cisco.com/en/US/products/hw/switches/ps628/products_configuration_guide_chapter09186a008007e8d9.html

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Still to become resolved

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Firewall support

- If tv and radio content should be delivered in a larger scale using multicast, more extended support would be needed in firewalls (both corporate and personal)

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Future

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Source specific multicast

- Instead of joining a multicast group, you will join a group and a source (solves the security issue)
- This would require IGMPv3 support on the access switches, as well as support for SSM in the core, or...
- IGMPv3 might be an issue, but there are a couple of easy migration-paths
 - URD (URL Rendezvous Directory)
 - DNS based S,G lookup in the router.

Will give full SSM support from first router hop, and it supports all legacy IGMPv1-v2 applications that is available today

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Future, requirement

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SSM peering

- Agreements between service providers to start to enable SSM peering over their existing unicast peering
- This can easily co-exists with existing Multicast, since SSM is supposed to use the 232.x.x.x addresses

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More information

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Cisco Sweden broadband portal

<http://www.cisco.com/global/SE/broadband/home.shtml>

Cisco multicast homepage

<ftp://ftp-eng.cisco.com/ipmulticast.html>

Cisco feature navigator

<http://www.cisco.com/go/fn>

SSM operational guidance

<http://www.ietf.org/internet-drafts/draft-ietf-mboned-ssm232-06.txt>

SSM description of the architecture

<http://www.ietf.org/internet-drafts/draft-ietf-ssm-arch-03.txt>

Reserved Multicast addresses

<http://www.iana.org/assignments/multicast-addresses>

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Q & A

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S,G lookup in DNS, description

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- Enable SSM for existing applications
- Works with every existing set-top-box that supports IGMPv1 or v2
- Router configured to send a dns request for S,G match when a new IGMPv1 or v2 join is received

Complete host platform independence

- Nothing to configure on the host
- 0.00 changes to the host
- DNS entries for multicast sources needed

<ftp://ftpeng.cisco.com/ipmulticast/config-notes/ssm-map.txt>

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URD Description

Cisco.com

- Enable SSM for existing applications
- Works with every browser that supports frames
- No plug-in required

Complete host platform independence

- Nothing to configure on the host
- 0.00 changes to the host
- URL easily added to WWW server HTML pages

(just a second call for a specific tcp port that will be intercepted by the router)

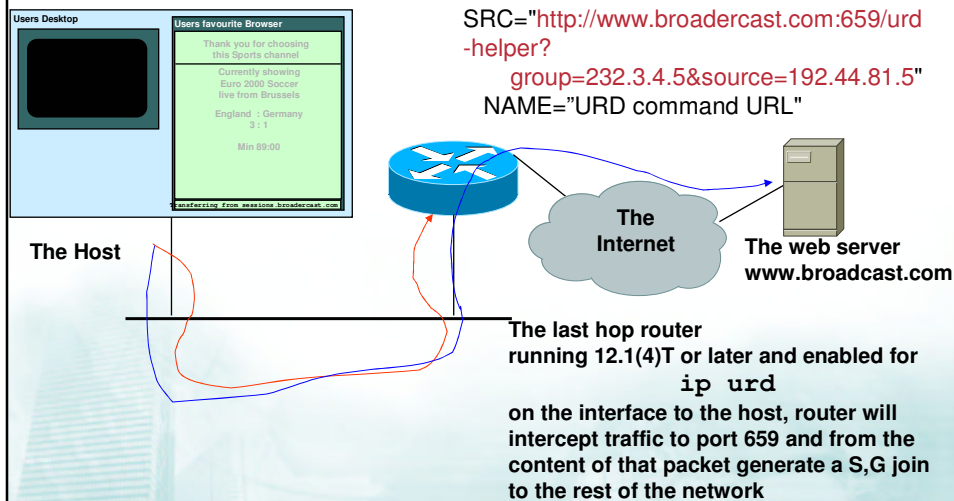
<ftp://ftpeng.cisco.com/ipmulticast/ssm/index.html>

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How URD works

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