

IPv6 Troubleshooting

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INTC Project

- Industry Network Technology Council (INTC)



- Funding: Grant from ARIN

- Thank you!

<https://www.iiesoc.in/>

<https://industriynetcouncil.org/>

Vision

Multi-year project: IPv6 deployment at enterprises.

Collaboration with American Registry for Internet Numbers (ARIN)

- Provide training,
- Analysis of security and application conversion,
- Help enterprises plan their IPv6 deployment.

Classes

- Introduction to IPv6 : Feb 4, 2021
- Lab: IPv6 basics : Feb 11, 2021
- Neighbor Discovery: March 4, 2021
- Lab: Neighbor Discovery: March 18, 2021
- IPv6 Address Planning: April 8, 2021
- Lab: IPv6 Address Planning: April 15, 2021
- IPv6 Transition Mechanisms: May 6, 2021
- Lab: IPv6 Transition Mechanisms: May 13, 2021

- DHCPv6: June 3, 2021
 - Lab: DHCPv6: June 10, 2021
 - IPv6 and Cloud: June 17, 2021
 - Lab: IPv6 and Cloud: June 24, 2021
 - Introduction to IPv6 Security July 8, 2021
- The next sessions are sponsored by a generous grant from ARIN.
- Trace Reading: August 12, 2021
 - Troubleshooting: August 19, 2021

A few words about me

- President: Industry Network Technology Council
- Founder & CEO: Inside Products, Inc.
- Advisory Board: India Internet Engineering Society
- RFCs: RFC8250 (Embedded performance and diagnostics for IPv6) and others
- Product developer (OEMed by IBM and others)
- Working with IPv6 for 15 years
- Working with network management, diagnostic, performance issues at large brick-and-mortar enterprises for over 30 years



Mike Ackermann

- Michael Ackermann is the **Lead Network Engineer of the System Management and Monitoring Team, at Blue Cross Blue Shield of Michigan.**
- He is responsible for all aspects of **planning, engineering, deployment and administration** for all enterprise wide Management, Monitoring and Diagnostic activities.
- Mike also serves as a **chief architect** for all Plan related IT issues. He has been a member of the BluesNet and Network Advisory Group committees since their inception and has served as committee and subcommittee chair on numerous occasions. Mike has also been a member of several advisory boards and is currently **active in the IETF and INTC.**





Nothing but reading traces for an hour!

Agenda

- **Start Wireshark** (no browsers)
- **Start Chrome**
- **Start Firefox**
- **Traces 1 - 8**

IPv6 Multicast Scope

- IPv6 multicast addresses start with FF.
- Last 4 bits is scope. (Ex. FF01, FF02, etc).
- FF01:: means on same interface
- FF02:: means on same link
- FF05:: means in the same site
- FF0E:: means in the Internet.

(From RFC 4291)

Common IPv6 Multicast Groups

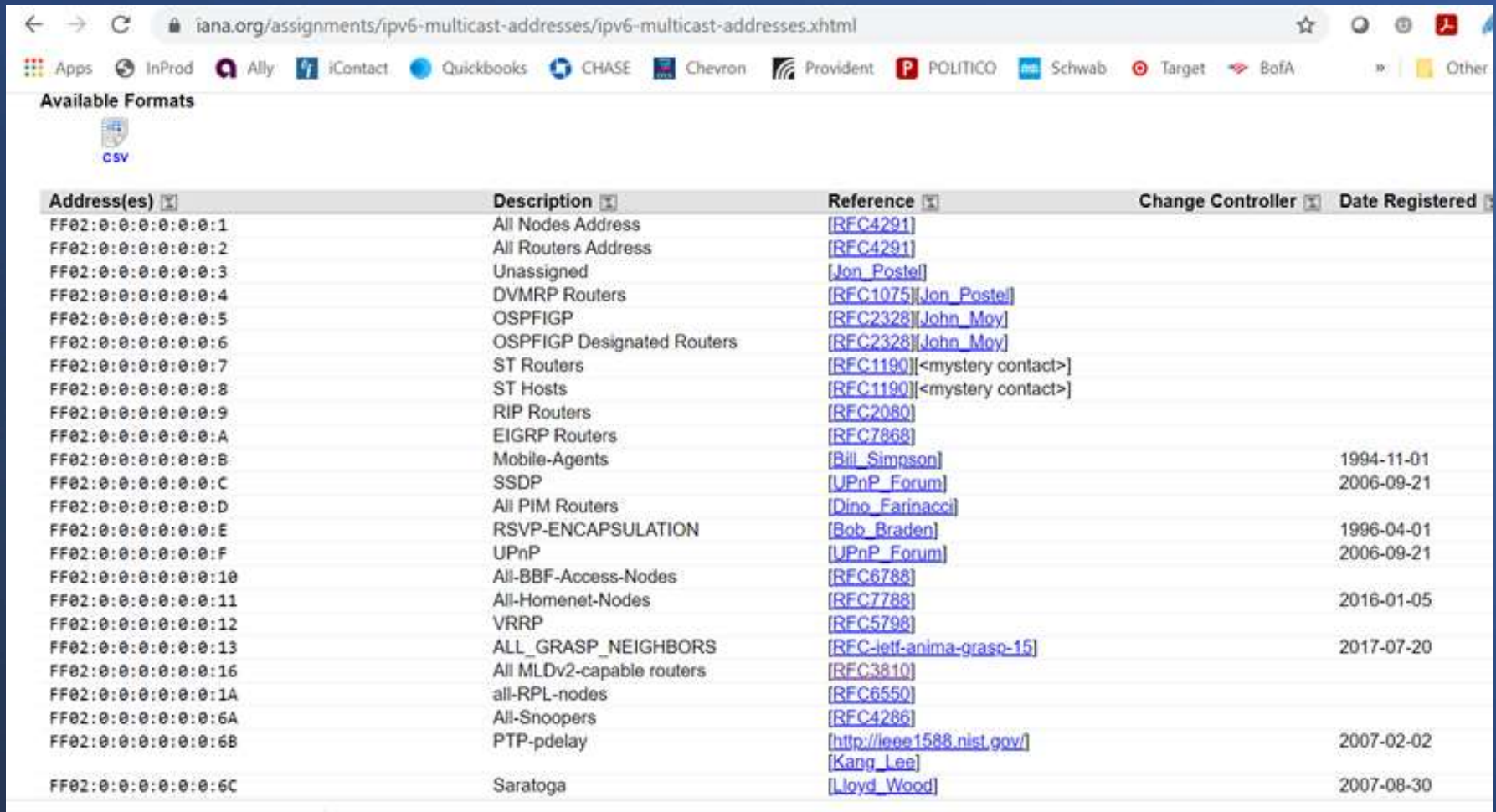
- Multicast addresses are registered with the Internet Assigned Numbers Authority (IANA).

See:

<http://www.iana.org/assignments/ipv6-multicast-addresses/ipv6-multicast-addresses.xml>

<u>IPv6 multicast address</u>	<u>Description</u>
FF02::1	The all-nodes address
FF02::2	The all-routers address
FF02::5	The all-Open Shortest Path First (OSPF) routers address
FF02::6	The all-OSPF designated routers address

IANA IPv6 Multicast Groups



The screenshot shows a web browser window with the URL iana.org/assignments/ipv6-multicast-addresses/ipv6-multicast-addresses.xhtml. The page displays a table of IPv6 multicast groups. The table has five columns: Address(es), Description, Reference, Change Controller, and Date Registered. The data is as follows:

Address(es)	Description	Reference	Change Controller	Date Registered
FF02:0:0:0:0:0:0:1	All Nodes Address	[RFC4291]		
FF02:0:0:0:0:0:0:2	All Routers Address	[RFC4291]		
FF02:0:0:0:0:0:0:3	Unassigned	[Jon Postel]		
FF02:0:0:0:0:0:0:4	DVMRP Routers	[RFC1075] [Jon Postel]		
FF02:0:0:0:0:0:0:5	OSPFv2	[RFC2328] [John Moy]		
FF02:0:0:0:0:0:0:6	OSPFv2 Designated Routers	[RFC2328] [John Moy]		
FF02:0:0:0:0:0:0:7	ST Routers	[RFC1190] [<mystery contact>]		
FF02:0:0:0:0:0:0:8	ST Hosts	[RFC1190] [<mystery contact>]		
FF02:0:0:0:0:0:0:9	RIP Routers	[RFC2080]		
FF02:0:0:0:0:0:0:A	EIGRP Routers	[RFC7868]		
FF02:0:0:0:0:0:0:B	Mobile-Agents	[Bill Simpson]		1994-11-01
FF02:0:0:0:0:0:0:C	SSDP	[UPnP Forum]		2006-09-21
FF02:0:0:0:0:0:0:D	All PIM Routers	[Dino Farinacci]		
FF02:0:0:0:0:0:0:E	RSVP-ENCAPSULATION	[Bob Braden]		1996-04-01
FF02:0:0:0:0:0:0:F	UPnP	[UPnP Forum]		2006-09-21
FF02:0:0:0:0:0:0:10	All-BBF-Access-Nodes	[RFC6788]		
FF02:0:0:0:0:0:0:11	All-Homenet-Nodes	[RFC7788]		2016-01-05
FF02:0:0:0:0:0:0:12	VRRP	[RFC5798]		
FF02:0:0:0:0:0:0:13	ALL_GRASP_NEIGHBORS	[RFC-ietf-anima-grasp-15]		2017-07-20
FF02:0:0:0:0:0:0:16	All MLDv2-capable routers	[RFC3810]		
FF02:0:0:0:0:0:0:1A	all-RPL-nodes	[RFC6550]		
FF02:0:0:0:0:0:0:6A	All-Snoopers	[RFC4286]		
FF02:0:0:0:0:0:0:6B	PTP-pdelay	http://ieee1588.nist.gov/ [Kang Lee]		2007-02-02
FF02:0:0:0:0:0:0:6C	Saratoga	[Lloyd Wood]		2007-08-30

MDNS: Multicast DNS

From RFC6762

“As networked devices become smaller, more portable, and more ubiquitous, the ability to operate with less configured infrastructure is increasingly important. In particular, the ability to look up DNS resource record data types (including, but not limited to, host names) in the absence of a conventional managed DNS server is useful.

Multicast DNS (mDNS) provides the ability to perform DNS-like operations on the local link in the absence of any conventional Unicast DNS server. In addition, Multicast DNS designates a portion of the DNS namespace to be free for local use, without the need to pay any annual fee, and without the need to set up delegations or otherwise configure a conventional DNS server to answer for those names.”

SRVLOC: Service Location Protocol

From RFC2608:

“The Service Location Protocol provides a scalable framework for the discovery and selection of network services. Using this protocol, computers using the Internet need little or no static configuration of network services for network based applications. This is especially important as computers become more portable, and users less tolerant or able to fulfill the demands of network system administration.”

SRVLOC: Intent

“SLP is intended to function within networks under cooperative administrative control. Such networks permit a policy to be implemented regarding security, multicast routing and organization of services and clients into groups which are not be feasible on the scale of the Internet as a whole.

SLP has been designed to serve enterprise networks with shared services, and it may not necessarily scale for wide-area service discovery throughout the global Internet, or in networks where there are hundreds of thousands of clients or tens of thousands of services.”

Questions?

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More webinars at:

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