

# OSPF for IPv6

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# Routing in IPv6

# Routing

- Routing in IPv6 is very much like in IPv4
  - The protocols use underlying IPv6 features such as extension headers and router alert
  - But from the operator perspective IPv6 routing “feels” common

# Common IPv6 routing protocols

- IGP (Interior Gateway Protocol)
  - RIPng
  - IS-IS for IPv6
  - OSPFv3
  - EIGRP for IPv6
- EGP (Exterior Gateway Protocol)
  - BGP4+

# OSPFv3

# OSPFv3

- OSPFv3 is the IPv6 version of OSPFv2
  - It usually runs on IPv6 only
    - ↪[RFC 7949](#) defines "OSPFv3 over IPv4 for IPv6 Transition"
  - OSPFv3 runs over each link, instead each subnet
  - OSPFv3 relies on IPSec support in IPv6 for authentication (see ↪[RFC 4552 Authentication/Confidentiality for OSPFv3](#))

# OSPFv3

- OSPFv3 multicast communication addresses:
  - **AllSPFRouters** - ff02::5
  - **AllDRouters** (OSPF designated router and backup-designated router) - ff02::6

# OSPFv3

- OSPFv3 message changes
  - IPv6 addresses moved from header into payload
  - OSPF router-id, area-id and link-state-id are still 32bit
    - These values are displayed as dotted-decimal
    - These values do not represent IPv4 addresses!
    - They should be set explicit (not derived from IPv4 addresses)

# OSPFv3

- ↪ RFC 5838 "Support of Address Families in OSPFv3" specifies how address families other than IPv6 can be used in OSPFv3
  - Requires IPv6 as the transport of the routing information between OSPFv3 router

# OSPFv3 Updates

- ↪ RFC 6969 "OSPFv3 Instance ID Registry Update" defines half of the "Unassigned" number space in the IANA "OSPFv3 Instance ID Address Family Values" for private use
- ↪ RFC 8362 "OSPFv3 Link State Advertisement (LSA) Extensibility" extends the LSA format by encoding the existing OSPFv3 LSA information in Type-Length-Value (TLV) tuples and allowing advertisement of additional information with additional TLVs.

# HomeNet

- OSPFv3 is one of the base protocols of the IETF HomeNet protocol family ↪ <https://tools.ietf.org/wg/homenet/>
- ↪ RFC 7503 "OSPFv3 Autoconfiguration" defines extensions to OSPFv3 that allow complete autoconfiguration ("plug-and-play network")

# Questions?

