

IPv6 Monitoring

Get to know your IPv6 network

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CREATED: 2025-01-24 FRI 16:13

Agenda

- Monitoring of IPv6 networks
- Monitoring of Dual-Stack networks
- Monitoring IPv6/Dual-Stack services
- Monitoring Network Functions

Monitoring of IPv6 Networks

The importance of monitoring

- Especially when IPv6 is introduced in a network, monitoring of the active network components and services is essential
 - Only through correct and comprehensive monitoring can problems be quickly identified and rectified.
- Monitoring for IPv6 should therefore be set up before IPv6 is activated in the networks.
 - At a minimum, the monitoring should include the functional scope of the current IPv4 monitoring.

Modern Monitoring

- Many networks take the introduction of IPv6 as an opportunity to re-evaluate the network monitoring, adapt it to the new requirements and modernize it
 - Use of NetCONF/YANG instead of SNMP
 - Integration into the configuration management
 - Use of modern network monitoring tools (Prometheus, Grafana visualization etc)

Monitoring of Dual-Stack networks

DNS vs. IP address based monitoring

- In IPv4-only networks, there is often a one-to-one relation between the IPv4 address and the domain name of a service
- In Dual-Stack networks, a service can have multiple IPv6 addresses besides the IPv4 address
 - There might be a need to monitor the service on all addresses

DNS vs. IP address based monitoring

- Care should be taken to ensure that the services are not only monitored via domain name, even if the end devices address these services via a domain name
- When connecting via domain name, only one of the two network protocols is tested (IPv4 or IPv6)
 - Usually IPv6 is preferred by the operating systems IP stack
- Therefore, in addition to monitoring via a domain name or an URL, monitoring via dedicated IPv4-only and IPv6-only domain names or IP addresses should be configured

Recommendations for IPv6 monitoring

Monitoring for Dual-Stack services

- The following active monitoring tests are recommended per service:
 - Connection to the service via IPv4 Address
 - Connection to the service via IPv6 Address
 - Connection via dual stack (via domain name)
 - Test DNS resolution via IPv4
 - Test DNS resolution via IPv6
 - Test DNS resolution via dual stack

Monitoring of Network Services

- The following services should be monitored in the network:
 - Test DHCPv4 address assignment (if available)
 - Test DHCPv6 address assignment (if available)
 - Test Router Solicitation / Router Advertisement (per router)
 - Test OSPFv3 route information (internal routing)
 - Test BGP route information (external routing)

Monitoring of Network Services

- The following services should be monitored in the network:
 - Test NTP time request
 - Test IPv4 firewall function
 - Test IPv6 firewall function
 - Test application and protocol proxy (per service, if available)

Questions?

