

Netfinder, a real-time network topology discovery tool

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In a large Data Center, such as a LHC Tier-1, where the structure of the Local Area Network and Cloud Computing Systems varies on a daily basis, network management has become more and more complex.

In order to improve the operational management of the network, this article presents a real-time network topology auto-discovery tool named Netfinder.

The information required for effective network management varies according to the task of the moment: it can be the map of the entire physical network, the maps of the overlay networks at VLAN level, i.e. a different map for each VLAN ID, or a “Routing Map” that shows the IP logical connectivity, such as which devices operate as a router and for which IP networks.

The system can operate as a real-time host localization tool: given an hostname or a MAC or an IP address, it is able to find and map where it is plugged in at the moment a query is made, specifically on which physical port of which switch, as well as the VLAN-ID and the IP Network it belongs to and the physical device that acts as its default gateway.

These informations are completely auto-discovered leveraging the Simple Network Management Protocol (SNMP), Internet Control Message Protocol (ICMP) and the Address Resolution Protocol (ARP). In particular the discovery algorithm is based on standard SNMP MIB-II and ICMP commands, in order to be exploitable in a multi-vendor environment.

This paper will describe both the software architecture and the algorithm used to achieve rapid network topology discovery and real-time host localization, as well as its web interface that allows system and network admins to make queries and visualize the results.

Tertiary Keyword (Optional)

Visualization

Secondary Keyword (Optional)

Monitoring

Primary Keyword (Mandatory)

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