FLOW ANALYZER 1.0

By Nuviso

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OVERVIEW

Flow Analyzer from Nuviso is a Controller agnostic SDN App and is packaged with the Allegro product.

It provides insights into the network and identifies optimal path between two end points, based on various parameters requested by the user. It examines flows on each device in the network, and correlates path taken by each flow. The App also provides a heat map based on current traffic conditions to help users tune their network.

FLOW CORRELATION

Flow Correlation is one of the pivotal functionalities offered by Flow Analyzer App. It provides insight into the configuration of network and determines whether an incoming packet will reach the intended destination.

Given a source device and match criteria, the App displays all possible matching flows to the user. The match criteria can consist of:

- Device ID – indicates the source device from where the flow originates
- Input Port – indicates the specific port in the device
- Ethernet Match – indicates the ether type
- TCP-Source Port – indicates Layer 4 – tcp source port
- TCP-Destination Port – indicates Layer 4 – tcp destination port
- UDP – Source Port – indicates Layer 4 – udp source port
- UDP – Destination Port – indicates Layer 4 – udp destination port
- IPV4 Source – indicates source IP address
- IPV4 Destination – indicates destination IP address
- VLAN – ID – indicates the originating Vlan ID
- IP Protocol – indicates the IP protocol

Device ID, Input Port and Ethernet Match are mandatory information that the user needs to provide, and rest of the information is optional. After entering the criteria, user can submit the request for Flow Correlation.

The App calculates all the flows that match the given criteria and for each matching flow, it provides details of the entire end-to-end path. The path details include information such as the matched flow ID, devices traversed and flow statistics - packet count, byte count, Rx Capacity, and Tx Capacity. The flows are visually highlighted in the network topology and makes it easy for the user to correlate the path taken.

When multiple flows match the given criteria, the User is prompted to refine the input match criteria to narrow down the desired flow.

ALTERNATE/OPTIMAL PATH

Flow Analyzer App identifies best possible path between two end points based on the chosen parameters

OPTIMAL PATH BASED ON LEAST HOPS

To find the most optimal path between two end points with least number of hops, user provides the following information and selects the "Hops" option.

- Source Node – indicates the source device
- Destination Node – indicated the destination device
- Exclusion Node – indicates the devices that user would like to exclude from the path. Multiple nodes can be excluded.
- Exclusion Port – indicates the device ports that user would like to exclude from the path. Multiple device ports can be excluded.

Source Node and Destination Node are mandatory information that need to provided. Based on the inputs given by user, the App lists the path with least number of hops. When more than one path matches the criteria given, the system chooses the most appropriate path based on current traffic patterns. For each link along the suggested path, user is provided information such as source port and destination port of the link, stats of each link, and each link is labelled and highlighted in the network topology.

OPTIMAL PATH BASED ON LEAST LATENCY

To identify an optimal path with least latency between two end points, user provides the following information and selects the "Latency" option.

- Source Node – indicates the source device
- Destination Node – indicated the destination device
- Exclusion Node – indicates the devices that user would like to exclude from the path. Multiple nodes can be excluded.
- Exclusion Port – indicates the device ports that user would like to exclude from the path. Multiple device ports can be excluded

Source Node and Destination Node are mandatory information that needs to be provided. Based on the inputs given by user, the App lists the path with least latency. When more than one path matches the criteria given, the system chooses the most appropriate path based on current traffic patterns. For each link along the suggested path, user is provided information such as source port and destination port of the link, stats of each link, and each link is labelled and highlighted in the network topology.

OPTIMAL PATH BASED ON MAXIMUM AVAILABLE BANDWIDTH

To identify an optimal path with maximum available bandwidth between two end points, User provides the following information and selects the "Bandwidth" option.

- Source Node – indicates the source device
- Destination Node – indicated the destination device
- Exclusion Node – indicates the devices that user would like to exclude from the path. Multiple nodes to be excluded
- Exclusion Port – indicates the device ports that user would like to exclude from the path. Multiple device ports can be excluded

Source Node and Destination Node are mandatory information that User needs to provide. Based on the inputs given by user, the App lists the path with maximum available bandwidth. When more than one path matches the criteria given, the system chooses the most appropriate path based on current traffic patterns. For each link along the suggested path, user is provided information such as source port and destination port of the link, stats of each link, and each link is labelled and highlighted in the network topology.

HEAT MAP

Flow Analyzer App constantly monitors the traffic flowing through the network and provides a visual summary of the current health of network. With this feature, users can identify the least congested and most congested points in the network, and thereby tune their network.

The heat map uses color codes to represent different levels of congestion in the network. Below is how the colors in the Heat map need to be interpreted:

- Ports which have significant amount of traffic flowing through them are depicted with red color
- Ports which have moderate amount of traffic flowing through them are depicted with yellow color
- Ports which have trivial amount of traffic flowing through them are depicted with green color.

On the topology, user can click on a device, a link or a port to see more detailed information pertaining to that entity.

- Clicking on a device will display more information about this device on the right side panel. This information can include the Manufacturer Name, Version, all the ports on this device, and statistics for each port.
- When user clicks on a port, a list of all the flows on this port are displayed on the right side panel. For each flow, information such as Flow ID, Ethernet Type, Input Match Port, and flow stats are displayed.
- When user clicks on a link, information such as the end-points of the link, and link statistics are displayed on the right side panel.

DEPENDENCIES

The App works in conjunction with Allegro to realize its features. It relies on the ability of Allegro to discover the devices in the network, and collect data pertaining to each device. Flow Analyzer leverages the port statistics, link bandwidth and its latency to calculate network utilization.

Flow Analyzer App is limited to the type of Controllers supported by Allegro.