



US 20230231801A1

(19) **United States**(12) **Patent Application Publication**  
**Shenoy**(10) **Pub. No.: US 2023/0231801 A1**(43) **Pub. Date: Jul. 20, 2023**(54) **PLANNING AND MANAGING NETWORK  
PROBES USING CENTRALIZED  
CONTROLLER***H04L 45/02* (2006.01)*H04L 45/64* (2006.01)(52) **U.S. Cl.**CPC ..... *H04L 45/302* (2013.01); *H04L 41/12*(2013.01); *H04L 43/08* (2013.01); *H04L 43/12*(2013.01); *H04L 45/02* (2013.01); *H04L 45/64*

(2013.01)

(71) Applicant: **Juniper Networks, Inc.**, Sunnyvale,  
CA (US)(72) Inventor: **Nagaraja Manikkar Shenoy**,  
Bangalore (IN)(21) Appl. No.: **18/186,552**(22) Filed: **Mar. 20, 2023****Related U.S. Application Data**(63) Continuation of application No. 17/173,766, filed on  
Feb. 11, 2021, now Pat. No. 11,611,504, which is a  
continuation of application No. 16/354,402, filed on  
Mar. 15, 2019, now Pat. No. 10,924,392.**Publication Classification**(51) **Int. Cl.***H04L 45/302* (2006.01)*H04L 41/12* (2006.01)*H04L 43/08* (2006.01)*H04L 43/12* (2006.01)

(57)

**ABSTRACT**

In general, the disclosure describes techniques for measuring edge-based quality of experience (QoE) metrics. For instance, a network device may construct a topological representation of a network, including indications of nodes and links connecting the nodes within the network. For each of the links, the network device may select a node device of the two node devices connected by the respective link to measure one or more QoE metrics for the respective link, with the non-selected node device not measuring the QoE metrics. In response to selecting the selected node device, the network device may receive a set of one or more QoE metrics for the respective link for data flows flowing from the selected node device to the non-selected node device. The network device may store the QoE metrics and determine counter QoE metrics for data flows flowing from the non-selected node device to the selected node device.

