



US 20230231762A1

(19) **United States**

(12) **Patent Application Publication**
Wang et al.

(10) **Pub. No.: US 2023/0231762 A1**

(43) **Pub. Date: Jul. 20, 2023**

(54) **APPLICATION SESSION-SPECIFIC
NETWORK TOPOLOGY GENERATION FOR
TROUBLESHOOTING THE APPLICATION
SESSION**

(71) Applicant: **Juniper Networks, Inc.**, Sunnyvale,
CA (US)

(72) Inventors: **Jisheng Wang**, Palo Alto, CA (US);
Xiaoying Wu, Sunnyvale, CA (US);
Yedunandan Siddalingappa-Vitalapur,
Bishan (SG); **Abhiram Madhugiri**
Shamsundar, San Jose, CA (US);
Robert J. Friday, Los Gatos, CA (US);
Sudheer Matta, Mountain House, CA
(US); **Sunalini Sankhavaram**,
Saratoga, CA (US); **Kush Shah**, Santa
Clara, CA (US); **Randall Frei**, San
Jose, CA (US); **Sujai Hajela**, Saratoga,
CA (US); **Jacob Thomas**, Saratoga, CA
(US)

(21) Appl. No.: **17/935,704**

(22) Filed: **Sep. 27, 2022**

Related U.S. Application Data

(60) Provisional application No. 63/299,733, filed on Jan.
14, 2022.

Publication Classification

(51) **Int. Cl.**
H04L 41/0631 (2006.01)
H04L 41/0604 (2006.01)
H04L 41/22 (2006.01)
H04L 41/12 (2006.01)
(52) **U.S. Cl.**
CPC **H04L 41/064** (2013.01); **H04L 41/0627**
(2013.01); **H04L 41/22** (2013.01); **H04L 41/12**
(2013.01)

(57) **ABSTRACT**

A network management system (NMS) is described that provides a granular troubleshooting workflow at an application session level using an application session-specific topology from a client device to a cloud-based application server. During an application session of a cloud-based application, a client device running the application exchanges data through one or more access point (AP) devices, one or more switches at a wired network edge, and one or more network nodes, e.g., switches, routers, and/or gateway devices, to reach a cloud-based application server. For a particular application session, the NMS generates a topology based on network data received from a subset of network devices, e.g., client devices, AP devices, switches, routers, and/or gateways, that were involved in the particular application session over a duration of the particular application session. In this way, the NMS enables backward-looking troubleshooting of the particular application session.

