



US 20230231829A1

(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2023/0231829 A1**  
(43) **Pub. Date: Jul. 20, 2023**(54) **INCREASED COVERAGE OF  
APPLICATION-BASED TRAFFIC  
CLASSIFICATION WITH LOCAL AND  
CLOUD CLASSIFICATION SERVICES**(52) **U.S. Cl.**  
CPC ..... *H04L 63/0236* (2013.01); *H04L 47/2441*  
(2013.01); *H04L 63/1425* (2013.01); *H04L*  
*63/20* (2013.01)(71) Applicant: **Palo Alto Networks, Inc.**, Santa Clara,  
CA (US)(57) **ABSTRACT**(72) Inventors: **Mengying Jiang**, Campbell, CA (US);  
**Shengming Xu**, San Jose, CA (US);  
**Menglan Fang**, Milpitas, CA (US); **Ho  
Yu Lam**, Santa Clara, CA (US)(21) Appl. No.: **18/174,777**(22) Filed: **Feb. 27, 2023****Related U.S. Application Data**(62) Division of application No. 17/445,987, filed on Aug.  
26, 2021, now Pat. No. 11,616,759.(60) Provisional application No. 63/173,251, filed on Apr.  
9, 2021.**Publication Classification**(51) **Int. Cl.**  
*H04L 9/40* (2006.01)  
*H04L 47/2441* (2006.01)

A cloud-based traffic classification engine maintains a catalog of application-based traffic classes which have been developed based on known applications, and a local traffic classification engine maintains a subset of these classes. Network traffic intercepted by the firewall which cannot be classified by the local engine is forwarded to the cloud-based engine for classification. Upon determination of a class of the traffic, the cloud-based engine forwards the determined class and corresponding signature to the local engine. The firewall maintains a cache which is updated with the signatures corresponding to the class communicated by the cloud-based engine. Subsequent network traffic sent from the application can be determined to correspond to the application and classified according locally at the firewall based on the cached signatures. Localization of the cache to the firewall reduces latency of traffic classification operations as the catalog of classification information stored in the cloud scales.

