

EMBEDDED INTELLIGENCE

Embedding intelligence inside mobile networks maximises efficiency and security, and enables the adaptive networks of the future.

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As operators strive to reconcile the often conflicting objectives of delivering optimum QoS to their subscribers whilst meeting their financial objectives, the emphasis is shifting from deploying passive network capacity to developing networks that react in realtime, and in an intelligent way, to the demands placed upon them. This requires an understanding of the traffic and use patterns on the network and then using this knowledge in key network elements to create a smart, adaptive network that makes the most efficient use of resources and protects the security of its users.

IP CLASSIFICATION

The technique of IP classification reads the headers of IP packets and uses a library of thousands of applications and protocols to classify the packet. Applications are grouped into service types such as video, peer-to-peer, VoIP, Instant Messaging etc, making it easier to analyse and enable intelligent traffic decisions. When this information is combined with subscriber attributes, an accurate knowledge of the location, ARPU, device type and network performance metrics can be gained.

ADVANCED TECHNIQUES AND APPLICATIONS

IP classification software such as ipoque's PACE go beyond reading the information on the header and also use behavioral, heuristic and statistical analysis techniques to detect network protocols and applications with extreme accuracy, even if they use advanced obfuscation and encryption. PACE can be deployed in a variety of use cases including Network Security (IDS/IPS, Next Generation Firewalls, SIEM, UTM), Network Monitoring and Traffic Management, Policy and Charging, Application Delivery and Optimisation, Analytics, and Mobile Data Offload.

As more and more network elements become enhanced with embedded IP classification, a network with efficient routing and processing of traffic is developed.

DELIVERING NETWORK EFFICIENCY

A typical application of IP classification software is to embed it inside a Content Delivery Optimiser to identify video packets and decide autonomously what packets to cache, and when to cache them. In the RAN, IP classification inside small cells can be used to set decision points that define the conditions under which traffic is handed over between cellular access standards and Wi-Fi. Visibility of the services running on the network and knowledge of characteristics such as tolerance of latency is used to prioritise packets and manage traffic intelligently to deliver the desired QoS to subscribers. IP classification is also an important tool for revenue assurance; for example in a Policy and Charging Rules Function (PCRF) to enforce a data plan for a specific service such as Spotify or Netflix. Thereby, as more and more network elements become enhanced with embedded IP classification, a network with efficient routing and processing of traffic is developed.

REINFORCING SECURITY

Viruses and malware can compromise secure data held by subscribers, cause applications to fail and even threaten the integrity of a whole network. IP classification is an essential feature of modern firewalls because port information is no longer sufficient to classify traffic. Embedded inside Next Generation Firewalls, IP Classification provides visibility of application usage patterns and extracts metadata such as sender, receiver and file names in order to identify and eliminate malware. This gives firewall intrusion detection, anti-malware, spam and content filtering in one integrated package that can be installed and updated easily. Furthermore, Unified Threat Managers featuring IP classification are a critical line of defence to ensure secure operation of a communication network and often include advanced features such as identity-based access control, load balancing, intrusion prevention, SSL and SSH inspection and application awareness.

ENSURING QOS FOR SUBSCRIBERS

Insight into the Quality of Service experienced by the user is essential to monitor customer satisfaction and guard against subscriber churn. IP classification can analyse traffic to deliver fundamental QoS metrics such as the uplink and downlink data rate, voice and video quality, delay, packet latency, jitter and call completion rate. This data is used by IP analytics software to facilitate operational network monitoring and trouble shooting. Statistical analysis of this data can establish short-term and long-term trends in the performance of the network as well as show the top protocols and applications running on a network. Identifying usage trends enables an operator to track the growth of particular applications or overall traffic during a day or over a year, from a high-level that shows entire network links to the individual subscriber level. This knowledge is used to forecast demand and plan capacity to pre-emptively mitigate against network congestion and thus ensure continuity of subscriber QoS.

This can only be achieved by a network enriched with the intelligence of IP classification.

FOUNDATIONS OF A FUTURE NETWORK

As we look forward to the emergence of the Internet of Things (IoT), IP classification enables visibility of traffic derived from objects rather than subscribers and provides the network with the ability to provide an appropriate response. Statistical analysis of the traffic can determine the proportion of the traffic originating from machines so that trends can be established and traffic managed in an optimum way. For example, some IoT applications are time-critical whilst others are less demanding. Looking further ahead, some 5G use cases require extremely low latency or very high provision of bandwidth; network resources must be coordinated to deliver them. In such a scenario, near-realtime identification of the service, and a network able to adapt to ensure provision of the service, is required and this can only be achieved by a network enriched with the intelligence of IP classification.

THE ADAPTIVE NETWORK EMERGES

With IP classification becoming embedded in more and more elements in the RAN, gateways and the core, a mobile network emerges with the ability to understand the demands placed upon it and adapt in an intelligent way. This optimises the efficiency of a network and the way it delivers content, ensures network security and enables the services of the future.

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For more information on how embedded intelligence enables the adaptive network of the future, meet our experts at Mobile World Congress, Hall 6 Stand 6B50. Or visit www.ipoque.com.