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**Emerging Opportunities for Leveraging Network
Intelligence**

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1 Executive Summary

Service provider networks possess a wealth of information (network intelligence) relative to subscribers, applications and network state. Attempts to leverage this intelligence have, in the past, fallen short. The potential gain associated with network intelligence is significant. Additionally, new network technologies such as NFV and SDN, provide new possibilities for network and application optimization.

This focus group report has taken a “use case” approach in analyzing how network intelligence can be better leveraged in the network. Eleven different use cases have been analyzed. For each use case, both the network data inputs as well as potential outputs/network actions were considered to better leverage network intelligence.

Standards gaps were identified in three areas:

- Application specific data collection.
- Network data collection.
- Network actions or control points that can be used as a result of data analysis.

Additionally, three common themes emerged as a result of the analysis. First, the correlation of input data can greatly improve the range and effectiveness of subsequent actions. For example, a node, link or device may report congestion. If the congestion event can be correlated to identify specific subscribers participating in the congestion and if the subscriber contribution to congestion can be further correlated based on what application is being used, there is a much richer set of potential mitigations that can better optimize network resources as well as create new monetization opportunities.

The second theme is that the emerging NFV and SDN work creates new opportunities to utilize network information by enabling the implementation of automated network mitigations to “automatically” adjust network configuration and parameters to deal with changing traffic patterns and call models.

Finally, the Focus Group concluded that a common data exposure framework could increase the availability and usability of network data as collected by various analytics systems. That is, it would be useful if network elements could natively expose the right data in a common and consistent manner to allow analytics systems to capture the data with standard API calls within the network element. The focus group also realizes that such an undertaking may be a significant industry effort, however; this may be an opportune time to address this as network elements are adapted for more programmable control. In any case, consistent and timely access to data is essential to analytics analysis.

2 Introduction

Service provider networks possess a wealth of information (network intelligence) relative to subscribers, applications and network state. As service providers look to increase the value delivered to their subscribers and differentiate their fixed and mobile broadband services, they need to optimize the value of their network resources as well as leverage the massive amount of rich network data they possess.

Unfortunately, attempts to leverage this intelligence have, in the past, fallen short. A great deal of network intelligence is embedded in network elements with no standard or cost-effective mechanism to extract the information. Even when this information can be extracted, there often is no means to properly correlate extracted data across the network to create useful abstractions that can be used to both optimize network utilization as well as increase overall subscriber Quality of Experience (QoE).

Yet, the potential gain associated with network intelligence is significant. Additionally, new network technologies such as NFV and SDN, provide new possibilities for network and application optimization.

Network Intelligence exists across the network and tends to fall into three main categories:

- Subscriber data or Identity-based information may be used to make services and applications personalized and more attractive for the end-user. Personalization is a key component in