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Solution Brief

Allot Smart
Data Source

Turning Network
Big Data into Value

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Contents

1 Network Data is a Source of Value

Network usage data has tremendous value in helping you to get close to your customers by enabling you to see and measure the user and application traffic on your network and understand individual user behavior and experience online.

The key to obtaining this valuable information lies in your ability to extract rich and accurate network usage data and make it available to business intelligence systems so it can be analyzed in its own right, and correlated with other data sets in order to provide even deeper business insight. Your network data holds value for others too. Government and regulatory bodies may require you to supply or retain a variety of network data while other organizations may be interested in specific usage data from your network to support their business purposes.

While CRM and billing records are the traditional data sources that service providers analyze, they provide a limited view of the customer experience. Most of the interaction between your customers and your service is when they are online, using your network to socialize, work, get information, find directions, enjoy entertainment, play games and engage in all kinds of Internet-based activities. Granular network usage data is essential to obtaining a true 360-view of your customers, so you can offer the services they want at the most opportune time.

Allot Smart Data Source solutions help you extract rich usage data from your network and then to filter, aggregate, join and format it into relevant data sets per the specific use case you want to address, and per the requirements of the BI, CRM, and other systems that will receive and analyze the smart data. Allot's professional Data Science Service experts help you obtain the right data sets quickly and efficiently, so you can save time and money on your big data projects.

Let's take a closer look at **Allot Smart Data Source**.

2 Smart Data Source accelerates time to insight

Network data is big data. The ever-increasing volume and types of network usage data present significant data sourcing and data management challenges before a single analysis can be done!

Analytics tools that were built for IT professionals are often inadequate when it comes to knowing how to analyze Internet OTT application usage, web security events, or mobile video QoE. Getting properly curated source data to the relevant processing and analytics systems requires expertise and flexibility that is often lacking in the service provider organization. These obstacles make it difficult for them to extract valuable data from the network and to use it effectively.

Managing big data is also complicated by the tendency to store data in system silos

that do not communicate with one another and ostensibly have no connection to one another.

Allot Smart Data Source overcomes these challenges by enabling faster access to aggregated network data that is seamlessly exported to internal and 3rd party destinations where it accelerates the analytics process and results in faster time to insight. Allot enables you to join data from external systems with network usage data to create rich and focused data sets that are ready for analysis.

2.1 Reducing Costs

The cost associated with big data analytics is typically very high and is affected by multiple factors including:

- transmission links to real-time network data

- data warehouse capacity and processing power

- interface and formatting requirements of existing BI and other systems that will receive the source data

- data science expertise required to parse, aggregate and customize the data into relevant data sets for different stakeholders within and outside the organization.

Having a professional data scientist on staff is no guarantee that analysis and insights can serve all business workflows throughout the organization. Likewise, it may be impractical to hire data scientists for specialized use cases such as Crowd-Event Marketing and Behavior-based Retention Campaigns, or for time-constrained decision- makers such as the CMO. Different stakeholders need to be able to mine your network data for insights and answers that are often needed immediately in order to be of value.

Allot Smart Data Source reduces the costs of big data analytics by providing the utmost flexibility and expertise in extracting granular network data and transforming it into valuable and actionable information for each of your big data stakeholders.

2.2 Getting Valuable Data Faster

Time is of the essence when analyzing and justifying a use case for a new service, a customer retention campaign, or a micro-segmentation effort. If the data analysis cannot be done quickly, the opportunity may pass before an informed decision can be reached. Often, your organization struggles to manipulate huge volumes of data records until they make sense and are suitable for analysis.

Allot Smart Data Source solutions are purpose built to give you faster access to useful data that is tailored to the use case at hand and ready for analysis and extrapolation. Allot Smart Data Source employs a flexible process and purpose-built tools to deliver focused data sets that are easy to understand and to analyze, and lead to quick results. Rather than going through extensive data preparation, training, and a long IT

process, Allot Smart Data Source and Data Science Services help you reduce the sheer volume of data that needs to be analyzed, and to focus on obtaining actionable insight for the use case at hand.

Allot Smart Data Source solutions are already providing valuable insights for use cases including: QoE Management, Contextual Marketing, Application-based Charging, Churn Prediction, Customer Retention, Regulatory Compliance, and more.

With Allot Smart Data Source, your business can focus on what really matters – obtaining value and actionable insights from your own network usage data. Our experienced data science and consultancy experts will guide you through big and small projects alike, starting with problem definition, through proof of concept, to implementation of the most suitable and cost-efficient data source solution.

3   Flexible Data Sourcing

Allot Smart Data Source puts a wealth of actionable network data at your fingertips. Allot captures numerous dimensions of online usage, including session, location, application, device, security events, access type, content, interest, service plan, QoE score, etc. This wealth of data enables you to obtain a holistic view of the user experience and network performance. Moreover, Allot helps you filter, blend, and aggregate different data dimensions and measures into consolidated data sets that are ready for BI applications and other systems to analyze so you can take action. As a result, you can overcome integration hurdles and reduce the time it takes to deliver big data projects.
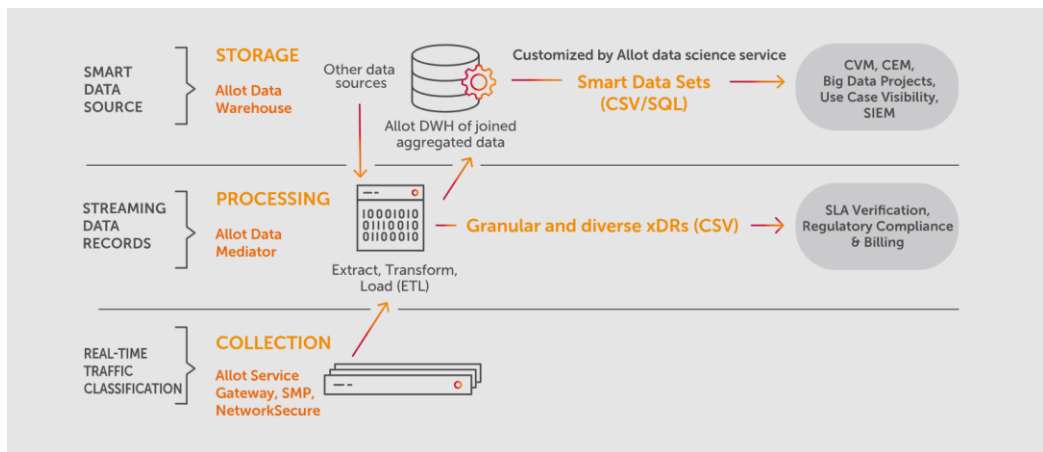
Smart data sourcing begins with Allot's ability to collect and classify huge volumes of granular network data in real time. From central and/or distributed points in your network, Allot Service Gateway platforms monitor network usage and create high-resolution data records, including real-time transactions per user, per application, per device, per video session, per VoIP and Instant Messaging session, per Web session, and more.

Data Records	Description

Web	Web transactions per user
Session	Session meta data and usage data per user
Application	Usage metrics per application volume, activity, QoE
Policy Rule	Usage metrics per policy classification, service plan
VoIP and IM	Minutes of use and session stats
Video	Viewing minutes and QoE
Security	Malware, phishing, unauthorized access events

Allot Smart Data Source provides high-resolution data records

Real-time data records are immediately transferred to Allot Data Mediator for processing and formatting before streaming (exporting) them to analytics applications; to external systems for compliance with data retention regulations, to billing systems; and to other destinations. The CSV format of data records is easily customized to the requirement of any destination. Likewise, frequency and triggers for data record export are configurable parameters, giving operators ready access to usage data that is critical to their business.

When more consolidated data sets are needed to justify a proposed use case or to contribute to your Big Data project, data records are loaded into the Allot Data Warehouse (HP Vertica) where they are filtered, joined, and aggregated per your use case requirements. The result is curated data that is streamlined so it requires less storage space – and smarter, providing relevant data sets that are ready to support your CVM (Customer Value Management), CEM (Customer Experience Management), in-house Big Data projects, SIEM, and more.

At each step of the way, Allot Data Science Service professionals speed your data sourcing projects along with expert customization of data records and data sets. In addition, Allot also provides customized analytics reports, reporting dashboards, and analytics tools.

Allot Smart Data Source lets you get the right data sets to support any use case, for any pain point, and for any stakeholder. The table below lists just a few of the possibilities, followed by real-life use cases.

Stakeholder	Pain Point	Use Case	Smart Data Sets		
Marketing	Customer Retention	Identify Potential Churner	Competitor sites & speed test usage		
	ARPU	Micro-segmentation	Data usage profile per: • 3G/4G/5G • Application • Location • Roaming • Volume		

Operations/ Engineering	Service uptake	Security as a Service	"User at Risk" profile per: • Risky apps • Risky websites • Usage diversity • Usage volume • Demographics			
	Performance Optimization	Traffic Management	Consumption percentiles Heavy users			
		QoS Assurance	QoE score per • Browsing • Streaming • VoIP • Application			

Stakeholder	Pain Point	Use Case	Smart Data Sets
		Trend Monitor	Encrypted traffic Greedy apps
		Cell Congestion Management	In-cell user QoE Bandwidth threshold events
		CMTS Congestion Management	Channel, bonding group • BW threshold events • QoE • Typical usage
	Security Threats	Abuse Management	Spammers Evaders Excessive Users
CTO	Regulatory Compliance	Mandatory Data Retention	Per user weblog Metadata Custom data

4 Use Cases

4.1 Customer Retention, Churn Reduction

4.1.1 • Identify Potential Churners according to online behavior

Retaining customers is the number one business priority and pain for CSPs because on average, it costs 5 times more to attract a new customer than to keep an existing one. Upselling to an existing customer can return 60-70% profitability, while selling to a new customer typically results in 5-20% profitability. Allot Smart Data Source helps you gain the visibility and insight you need to keep customers from churning.

With multiple Internet Service Providers in most countries, the option to churn is always there. Moreover, your competitors are actively trying to attract your customers to their network. Allot Smart Data Source helps you extract granular usage data from your network, so you can identify "subscribers at risk for churn" according to certain online behaviors. For example, one CSP decided to target their subscribers who visited *relevant pages* on competitor websites, or used speed-test applications, or both.


With Allot Smart Data Source, you can track specific HTTP transactions and analyze usage from a number of angles, such as how often subscribers engage in these activities each day, and is there any correlation between using the speed-test and visiting a competitor site. Allot Data Scientists help you obtain relevant data in very little time by expertly consolidating data sets so they can focus on the use case at hand. In this particular case, Allot Data Scientists developed a set of on-demand reports that the CSP uses as a fast-track method to identify and rank potential churners, and to target them with appropriate customer retention campaigns.

4.2   Experience Management

4.2.1   Cell Congestion Management based on real-time user QoE

89% of Internet Service Providers cite "customer experience" as a key factor driving loyalty and retention. While interactions with service representatives and salespeople play a role, the most frequent interaction mobile customers have with your network service is when they are online! A Tier-1 mobile operator in APAC wanted to find a way to track and measure the quality of the online customer experience in real time so they could proactively mitigate cell congestion episodes that threatened to have a noticeable impact on the user experience.

Allot offered the right mix of integrated solutions to help the operator achieve this goal, including Cell-Aware Congestion Management, Smart Data Source, and Data Science Services.
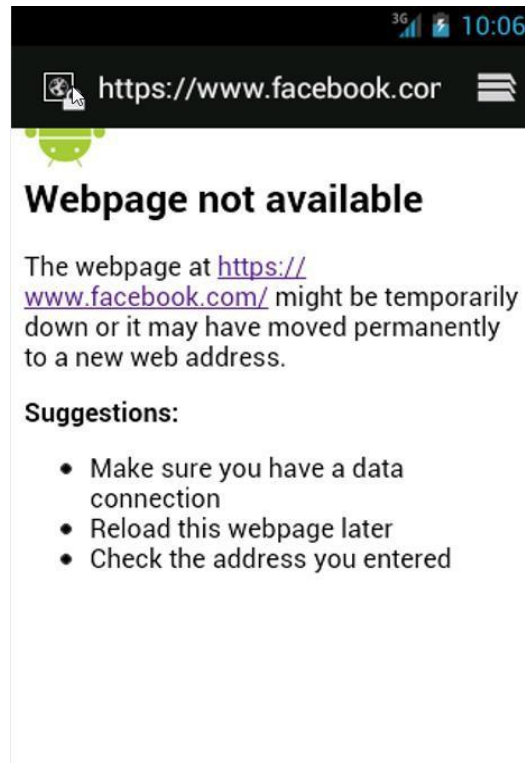
The operator started out by measuring cell congestion in the usual way - as a function of available bandwidth per cell. While general rules of thumb can be derived from this measurement, available bandwidth doesn't really tell us what individual users in the cell are experiencing. So, in parallel, Allot Smart Data Source was used to capture the TCP Quality of Experience and the TCP round-trip time per session, and to combine those two key statistics to obtain a QoE score per user session.

The next step was to correlate the available bandwidth per cell with the QoE scores of the users in that cell during the same time-frame in order to obtain an overall QoE score per cell. Allot Data Scientists analyzed the data and created a graphical reporting dashboard that the operator uses to monitor QoE per cell, and to trigger real-time congestion management policy when thresholds are reached.

As a result, cell congestion is kept under control and the operator is able to deliver a consistently good user experience that keeps subscribers satisfied and loyal.

4.2.2   Measuring Crowd Quality of Experience

At crowd events, thousands or even tens of thousands of smartphone users are packed into a single location or city area. Crowds put a big strain on mobile and Wi-Fi networks as data users share photos and videos throughout the event. Today, mobile carriers proactively design the network for such events, by allowing the RAN to provide more capacity (e.g., 3 x more) than normal usage, and by permitting more simultaneous connections. This kind of "flexible" capacity can be permanently built-in

or provided temporarily by removable cell sites, called "Cells on Wheels" or even by offloading to Wi-Fi when it is available. The goal is for attendees to enjoy and "share" the event without experiencing data service outages, delays or other QoE problems.

In this case, the operator used Allot Smart Data Source to extract data usage records and individual Quality of Experience scores for mobile subscribers at the event, in order to determine how well the mobile infrastructure at the event was able to meet bandwidth demand and maintain QoE, especially during peak usage moments. Allot   Data Science Services helped the operator create a reporting dashboard that they used to fine tune event infrastructure planning.

4.2.3   Targeted Promotions at Crowd Events

Major events are also an opportunity for CSP marketing campaigns to target subscribers with attractive promotions that are relevant to their interests. While it is natural to assume that a football game will attract "football fans," the operator in this case wanted to delve deeper to understand the range and variety of online behaviors at crowd events and to leverage that information to create targeted promotional campaigns.

Allot Data Source is used to monitor data usage in the cell sites covering the event and to collect data records per subscriber, device, and application. Allot Data Science Services customized data records for seamless export to the operator's BI application where behavior patterns and usage profiles are analyzed.

4.3   Regulatory Compliance

4.3.1   Mandatory Data Retention

Many governments have enacted Data Retention laws that require mobile and fixed Internet Service Providers to retain and export network data on web and app transactions per user. Often this data must conform to specific data warehouse requirements and must allow regulators to retrieve info on demand. Recently, a fixed- carrier customer of Allot was required to show proof of compliance by a specific deadline or face financial penalties for late delivery.

Allot delivered a turnkey solution on time and on budget based on Allot Smart Data Source that provided:

- Detailed HTTP web log of every user session

- Scalable, big data warehouse for storing the data for required retention periods
- GUI for fetching individual user data on demand for a specific time-frame
- URL categorization of HTTP browsing records per government requirements
- Customized formatting of xDRs so they could be streamed directly to a Hadoop BI system. This allowed new data sets to be introduced to Hadoop with ease and without having to change anything in the BI system. This alone saved significant time and money for the project.
- Metadata extraction from web transactions. This includes data that is not captured in xDRs, but is available and can be extracted. Allot Data Science Services were employed to overcome the challenge of doing this in real-time and at scale.

4.4   Contextual and Personalized Offers

4.4.1   Security as a Service for mobile users at risk

Malware is spreading rapidly into the mobile realm, transmitted through websites and apps that we use every day. Mobile operators have a real opportunity to be proactive and profitable by offering network-based security services to protect users at risk.

While every mobile user is at risk to a certain extent, not every mobile user is alike. With Allot Smart Data Source, you can determine the potential for malware risk, by correlating the online behavior of specific user profiles with the potential riskiness of the mobile apps and websites they use.

It starts with monitoring mobile data usage and obtaining high-resolution data records for the online activity of each subscriber. Analysis of this data reveals behavior profiles (microsegments) that are defined by distinctive and recurring patterns of app and website usage in relation to the volume of data consumed.

It continues by introducing external data regarding the potential malware riskiness of the apps and websites that were most popular with our behavioral profiles. Allot Data Science Services make it easy to import data from external sources and join it with network data to create new data sets.

By correlating the potentially risky apps and websites with the demographic and behavioral profiles, you can discover who is at risk and to what extent, and you can offer relevant security services to meet the needs of each microsegment.
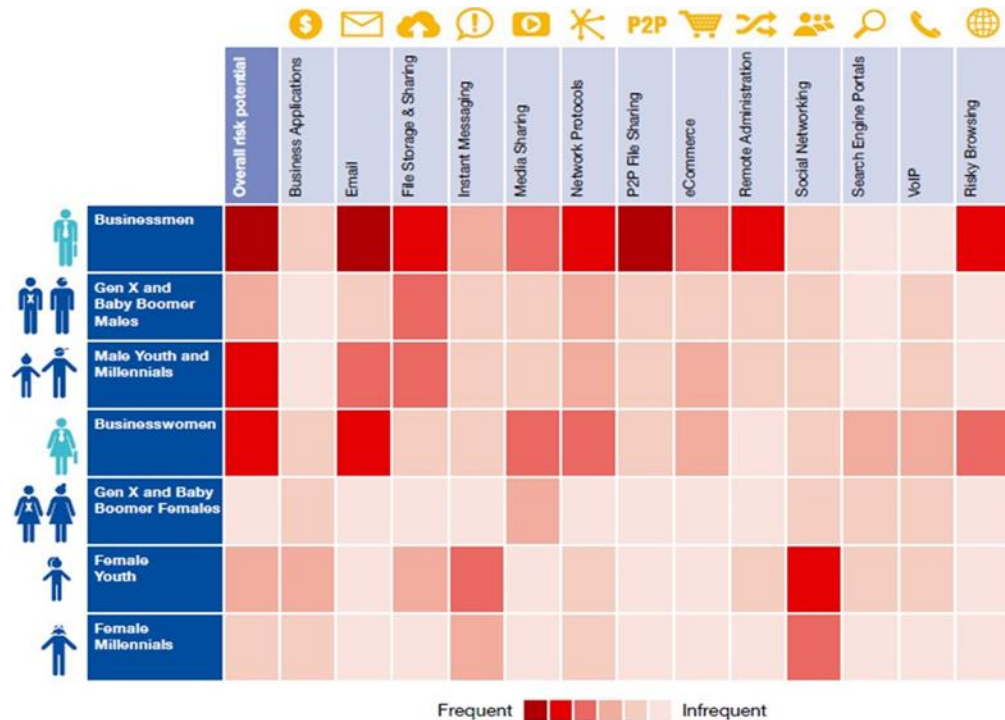
This heat map shows the potential for malware risk is affected by the diversity of apps and the frequency of their use. The data show that Businessmen are most at risk, while Female Baby Boomers / GenX incur the least risk.

Given the sheer number of mobile apps and the variety of devices, it makes sense to safeguard users at the network level where the security measures can provide a protective umbrella for all apps, browsers, and devices. Mobile operators are uniquely positioned to provide this level of protection for consumers and businesses.

With Allot Smart Data Source, you gain the insight needed to identify and reach out to customers who are at risk, targeting them with personalized Security as a Service from your network or cloud.

Allot Smart Data Source enables you to leverage the data in your own network to identify mobile users at risk and to target them with Security as a Service

5 Allot Smart Data Advantage

Allot Smart Data Source solutions are built to support network big data sourcing in real- time and at scale. Moreover, Allot's expert Data Science Services help you:

- Gain in depth traffic visibility across your entire network
- Extract the right data sets for any use case on demand

- Combine external data feeds from other systems into smart data sets
- Make smart data sets easily accessible to stakeholders
- Reduce storage requirements
- Reduce integration headaches
- Accelerate time to insight

6   Find Out More

Let us show you how to turn your network big data into value for every stakeholder in your organization. Contact us at sales@allot.com to set up a personal briefing, and visit our website to learn how Allot SmartVisibility solutions can advance your business.