

## DATA SHEET

# THE ARUBA ANALYTICS AND LOCATION ENGINE

The Aruba Analytics and Location Engine™ (ALE) is a virtual context aggregation and location engine that collects data about Wi-Fi-enabled mobile devices that are nearby or connected to an Aruba WLAN. This data is made available to analytics and data mining systems through high-performance APIs.

Contextual data allows external analytics and applications to mine the wealth of information about the people, devices and apps being used on the network – whether in enterprises or inside public venues – and extract useful business intelligence.

Insights about traffic patterns – including most traversed paths, dwell times and repeat visitor frequency – are correlated with other data sources, such as sensors, loyalty databases, and point-of-sale systems.

This enables enterprises to optimize real estate, merchandise locations, evaluate marketing effectiveness, offer guests and employees more personalized experiences and improve overall operational effectiveness.

### SERVICES SUPPORTED BY ALE

Associated and unassociated Aruba Wi-Fi client information is received and decoded by ALE. With this information, ALE performs three primary functions:

- Extract contextual information from the network, including user identity and roles, device types and application usage.
- Calculate location for associated and unassociated clients based on received signal-strength information or simply indicate the presence of a device in proximity to a specific AP.
- Forward and store contextual user and location data and present it to third-party applications/services through standard polling or publish-subscribe streaming APIs.

### ANALYTICS

Third-party analytics engines and big-data mining services analyze traffic flows and patterns and aggregate this data with loyalty databases and other business systems to provide a better understanding about customer behavior.

Within this analytics architecture, ALE aggregates as much opt-in information as possible from the WLAN and feeds it to a third-party analytics engine in the Aruba partner ecosystem. A presence feed indicates that a device is within range of the WLAN, and an events feed indicates when a device enters, crosses or leaves a predefined geofenced area.

Venues that need to know what types of devices enter their location can use ALE to procure the manufacturer, model, operating system DHCP and the browser user-agent (the line of text that identifies the browser) and the operating system to the web server. Venues can also observe app usage and destination URLs by monitoring data-plane traffic from the device.

ALE publishes this information via feeds to which third-party analytics engines can subscribe. Third-party analytics engines store the opt-in information in a database and analyze it with other opt-in sources of data that may include:

- Consumer online search and purchase history.
- Consumer point-of-sale records for in-store purchases.
- Demographics about the opted-in customer, including geographic location, birthday and family information.
- Environmental information like hot, cold or rainy day, public holiday or weekend, and seasonal influences.
- Other data-mining sources that are useful in revealing patterns in consumer activity.

### ALE AND PRIVACY

Businesses and the analytics industry are rightly aware of the sensitivity of personally identifiable information (PII). By default, all PII gathered from ALE is anonymous, including user identities and device MAC and IP addresses.

Aruba strongly recommends reviewing privacy policies with local regulators before implementing any data collection activities in public venues and to always ensure that users agree to terms and conditions.

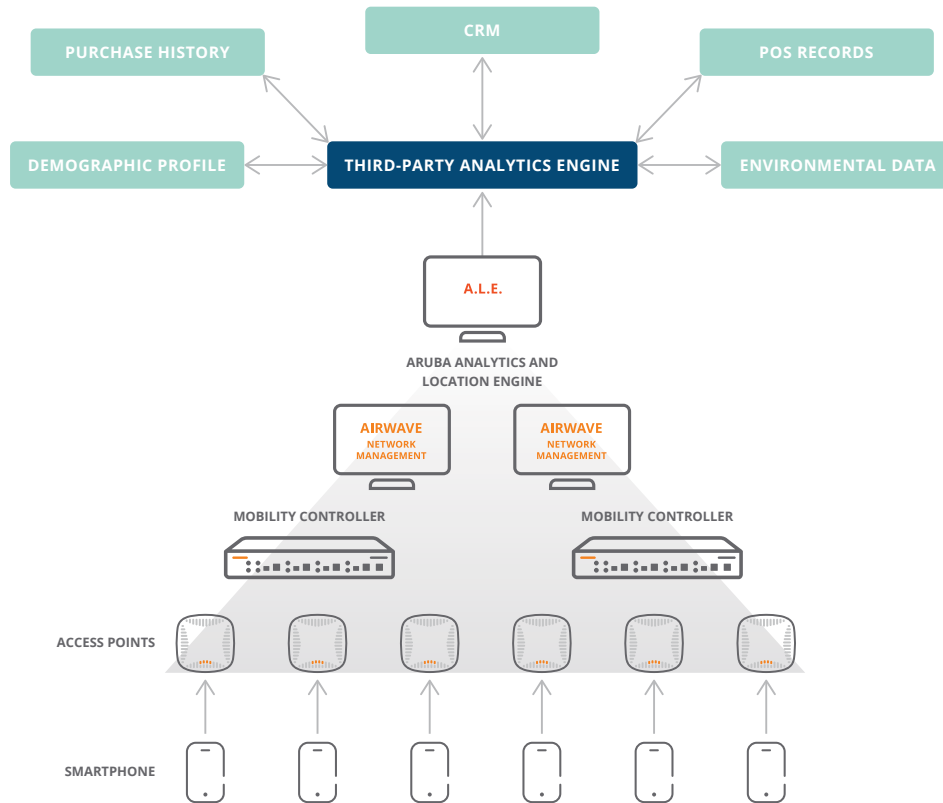


Figure 1. The Aruba Analytics and Location Engine works with an ecosystem of Aruba analytics engine partners and the WLAN infrastructure.

ALE-based analytics deliver business intelligence that can be used to improve the mobility experience in brick-and-mortar facilities, increase customer satisfaction, boost overall or category sales, or any other goal of the organization.

For instance, retailers can monitor real-time traffic patterns to determine whether more sales associates are needed on the floor during busy periods. Visitor flows can be analyzed at airports to alleviate bottlenecks so travelers can reach their flight departure gates on time.

Location and network analytics also help enterprises improve the quality of experience for critical apps and also enforce location-specific security and access policies.

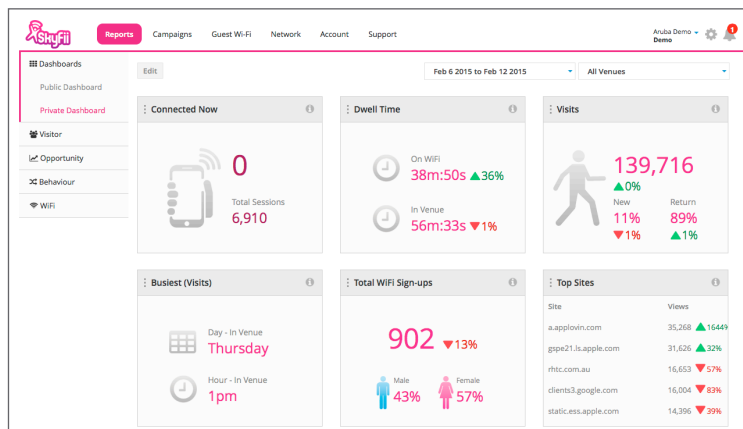


Figure 2. Aruba Analytics partners, such as SkyFii, work with ALE to provide actionable business intelligence for brick-and-mortar venues.

## SPECIFICATIONS

### System overview

- ALE is deployed as a virtual machine (VM) image.
  - One VM image, delivered as an OVA file, can be deployed with various hardware configurations – for CPU, memory, hard disk – based on scale requirements (see below).
  - CentOS 6.4 pre-installed with all needed dependencies.
- Supported on VMware ESX/ESXi 5.0 or higher.
- ALE requires a connection to Aruba AirWave™ network management VisualRF™ module to show a site map with AP locations. For small venues with 1-2 APs where presence is required but not triangulated location, ALE supports a mapless feature when used with Aruba Instant APs.

## SYSTEM OVERVIEW

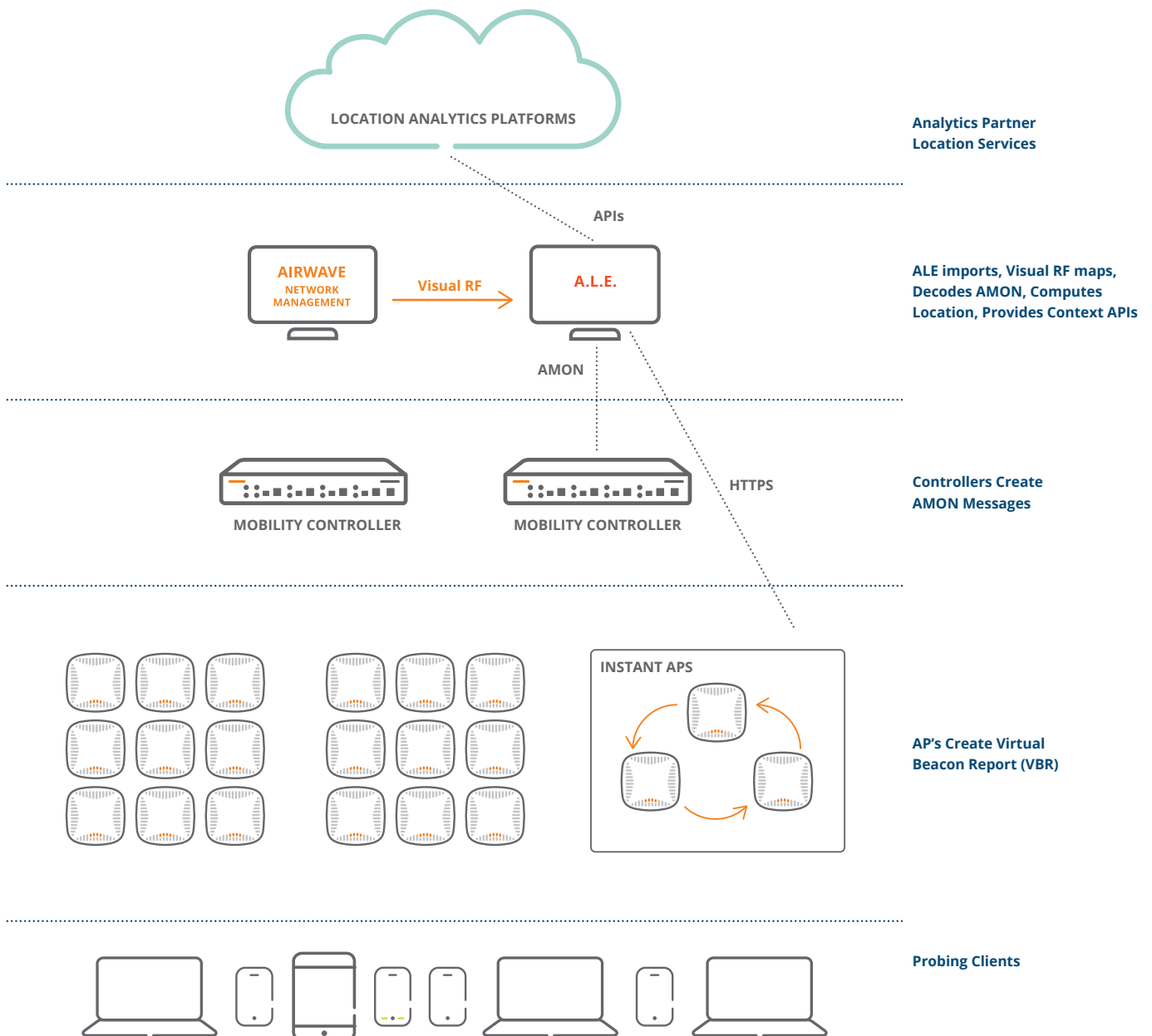


Figure 3

## System requirements

This table shows recommended system requirements for ALE in small, medium and large configurations. Up to 2,000 APs and 32,000 devices are supported on a single ALE instance.

Number of APs/clients	CPU cores	RAM (default)	Hard disk
500/8,000	4	16 GB	160 GB
1,000/16,000	8	24 GB	320 GB
2,000/32,000	16	48 GB	1 TB

- ALE supports the WebSockets protocol for secure communication over TCP with external cloud and analytics platforms.

## APIs

ALE is an API-driven solution. It supports two types of APIs:

1. **Polling API** based on representational state transfer (REST): This API provides the ability to query for specific information such as stations, location, URL destinations and applications. This API is mostly recommended for bootstrapping an application when it first starts up. It supports HTTP GET operation by providing a specific URL for each query and the output format is JSON.
2. **Publish/Subscribe API** based on Google Protobuf and ZeroMQ: This API allows the ability to subscribe for specific information. Once subscribed, ALE will start publishing messages on the subscribed topics, and sends them to the subscribers. The subscriber application needs to use 0MQ (or ZeroMQ) client libraries to connect to ALE.

Application developers processing the data uses the .proto file and the protocol buffer compiler (.protoc) to generate the message parsing code in various languages (C++, Java or Python). This API is recommended for any application that wants real time updates for all the devices on the network.

API details are documented in the ALE API Guide, which is available to development partners through the Aruba support web site.

## Supported infrastructure

- ALE can be used with Aruba Mobility Controllers and controllerless Aruba Instant WLANs.
  - Requires ArubaOS 6.3 or higher for Aruba controller-managed WLANs.
  - Requires Aruba InstantOS 4.0 or higher for Aruba controllerless WLANs.
- All new 802.11n and 802.11ac APs are supported. Some older generation APs have not been tested.

## Ordering information

- ALE is licensed on a per-AP basis and it is available as free beta until June 2015. Please contact your local Aruba sales representative for access to ALE. Pricing and SKUs will be updated in June 2015.