

HPE Aruba Networking Analytics and Location Engine

Using the network to understand user and device context

The HPE Aruba Networking 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 HPE Aruba Networking WLAN. ALE does not store any data. It processes the data coming in from the Wi-Fi devices and data is made available to external analytics and data mining systems via northbound APIs.

Contextual data allows external analytics applications to access the wealth of data about the people, devices, and apps being used on the network—whether in corporate offices or inside public venues—and extract useful business intelligence.

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

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

Services supported by ALE

Associated and unassociated Wi-Fi client information is collected 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 employee or customer behavior.

Within this analytics architecture, HPE Aruba Networking Analytics and Location Engine aggregates as much opt-in information as possible from the WLAN and feeds it to a third-party analytics engine. 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 understand the manufacturer, model, operating system, and browser type used. 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

HPE Aruba Networking Analytics and Location Engine and privacy

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

HPE Aruba Networking strongly recommends reviewing privacy policies with local regulators before implementing any data collection activities in public venues and to operationalize opt-in procedures to ensure that users agree to terms and conditions.

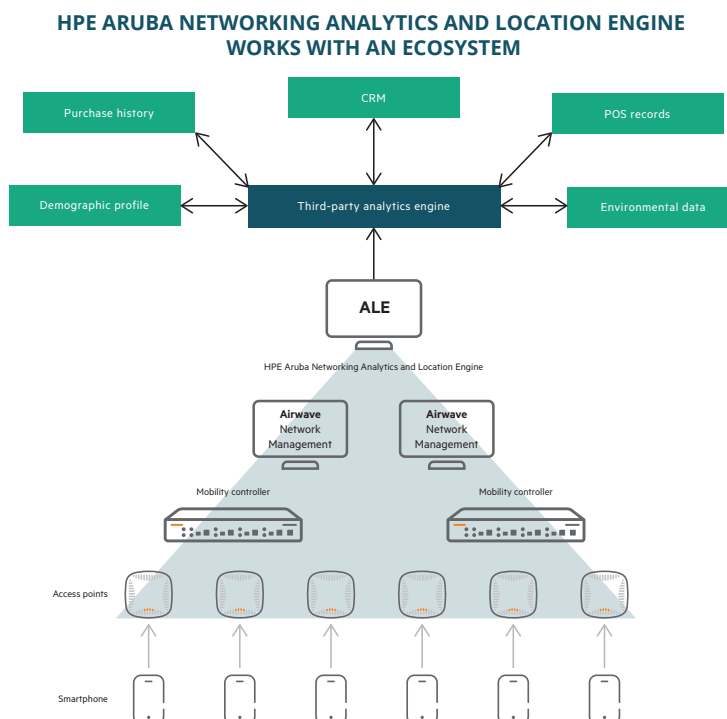


Figure 1. The HPE Aruba Networking Analytics and Location Engine Analytics and Location Engine works with an ecosystem of Aruba analytics engine partners and the WLAN infrastructure.

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

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.

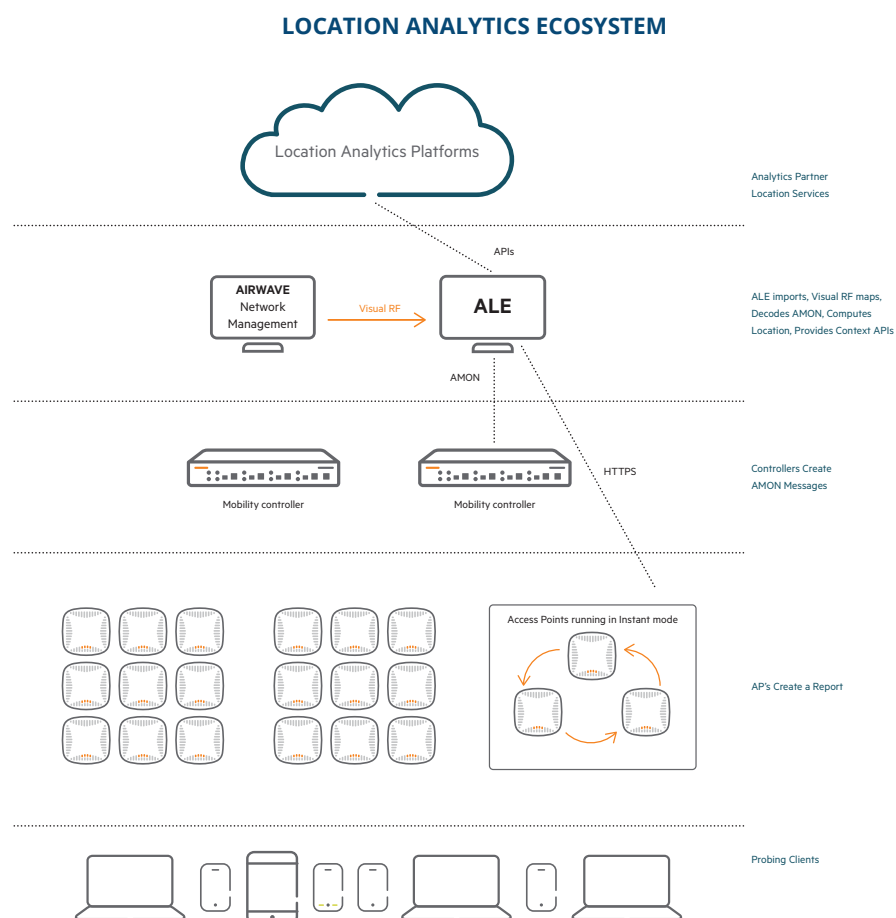
Location and network analytics also help enterprises improve the quality of experience for critical apps and also enforce location-specific security and access policies.

- 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 6.9 is 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 triangulated location information is not needed, ALE supports a mapless feature when used with APs in controllerless mode.

Specifications

System overview

- HPE Aruba Networking Analytics and Location Engine is deployed as a virtual machine (VM) image.



System requirements

This table shows recommended system requirements for HPE Aruba Networking Analytics and Location Engine in small, medium, and large configurations.

Refer to [this site](#) for the latest ALE system requirements.

Number of APs/ Clients	CPU cores	RAM (default)	Hard disk	Size
Up to 500/8k	8	16 GB	100 GB	Small
Up to 1K/16K	8	24 GB	320 GB	Medium
Up to 2K/32K	16	48 GB	1 TB	Large

APIs

HPE Aruba Networking Analytics and Location Engine 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 OMQ (or ZeroMQ) client libraries to connect to ALE. Application developers processing the data use 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 requires 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

- HPE Aruba Networking Analytics and Location Engine is supported with HPE Aruba Networking Wireless Operating System running Instant 6.4.4 or later.
- HPE Aruba Networking Analytics and Location Engine is supported with HPE Aruba Networking Wireless Operating System running AOS 8.3 or later.

Ordering information

- HPE Aruba Networking Analytics and Location Engine is licensed on a per-AP basis. Please contact your local HPE Aruba Networking sales representative or partner for access to ALE.
- JW604AAE: Aruba LIC-ALE-1 Analytics and Location Engine 1 AP License E-LTU

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