



Platform Overview

New and Changed Information

The following table describes changes to this guide.

Date	Revision
2017-08-31	Added Chapter 5, “Collecting NetFlow Data.”
2016-07-08	Initial publication

Overview

The WAN Automation Engine (WAE) platform is an open, programmable framework that interconnects software modules, communicates with the network, and provides REST and Thrift APIs to interface with external applications.

WAE Planning software provides the tools to create and maintain a model of the current network through the continual monitoring and analysis of the network and the traffic demands being placed on it. This network model contains all relevant information about a network at a given time, including topology, configuration, traffic, and routing information. You can use this information as a basis for analyzing the impact on the network due to changes in traffic demands, paths, node and link failures, network optimizations, and other possible changes to the network. With WAE Automation software, you can then deploy the results of the analyses and optimizations into the network for improved network performance or, for example, for temporary changes during network maintenance. WAE Automation uses open APIs and standardized protocols to provide interaction between applications and the network.

The WAE APIs enable you to develop applications that communicate using any language that supports REST or Thrift APIs. REST APIs are HTTP-based and are often used in the development of web-based services. Thrift is an open-source interface definition language that is used to define and create services for numerous languages.

The WAE platform has numerous use cases, including the following.

- Traffic engineering and network optimization—Add, modify, or delete network LSP configurations to improve network performance, or perform local or global optimization.
- Demand engineering—Examine the impact on network traffic flow due to adding, removing, or modifying traffic demands on the network.
- Topology and predictive analysis—Observe the impact to network performance due to changes in network topology whether driven by design or by network failures.

- Coordinated network maintenance—Explore options that minimize the impact of temporary changes to the network, such as for scheduled maintenance.
- TE tunnel programming—Examine the impact of modifying tunnel parameters, such as tunnel path and reserved bandwidth.
- CoS-aware (class of service) bandwidth on demand—Examine existing network traffic and demands, and admit a set of service-class-specific demands between routers.

**Note**

This guide is for single-system environments only and does not contain configurations for all modules. For further configurations, such as configuring distributed environments where there is more than one instance of the WAE platform, contact your support representative.

Modules

The platform workflow ([Figure 1-1](#)) consists of ongoing data collection, network analysis and optimizations, and deployment of the resulting requirements onto the network infrastructure.

- Collector Module—Discovers the network topology, routing and peering information, and polls network for traffic, as well as other object properties. This information is exposed through APIs and is available for use by WAE Live, WAE Design, and other applications, as well as by the Network Modeler Module.
- Network Modeler Module—Maintains a current network view in the working plan area. While changes can be made to the working plan area, the recommended practice is to use staging areas. Using staging areas, multiple users can work offline simultaneously to make and test modifications before merging them with the working network model and deploying them to the network.
- Calendaring Module—Is a database used to construct a proposed network that consists of the current network model, plus any changes that are scheduled to happen between the time the network model was created and a future date. Simulations are run to validate whether such changes are admissible to a network.

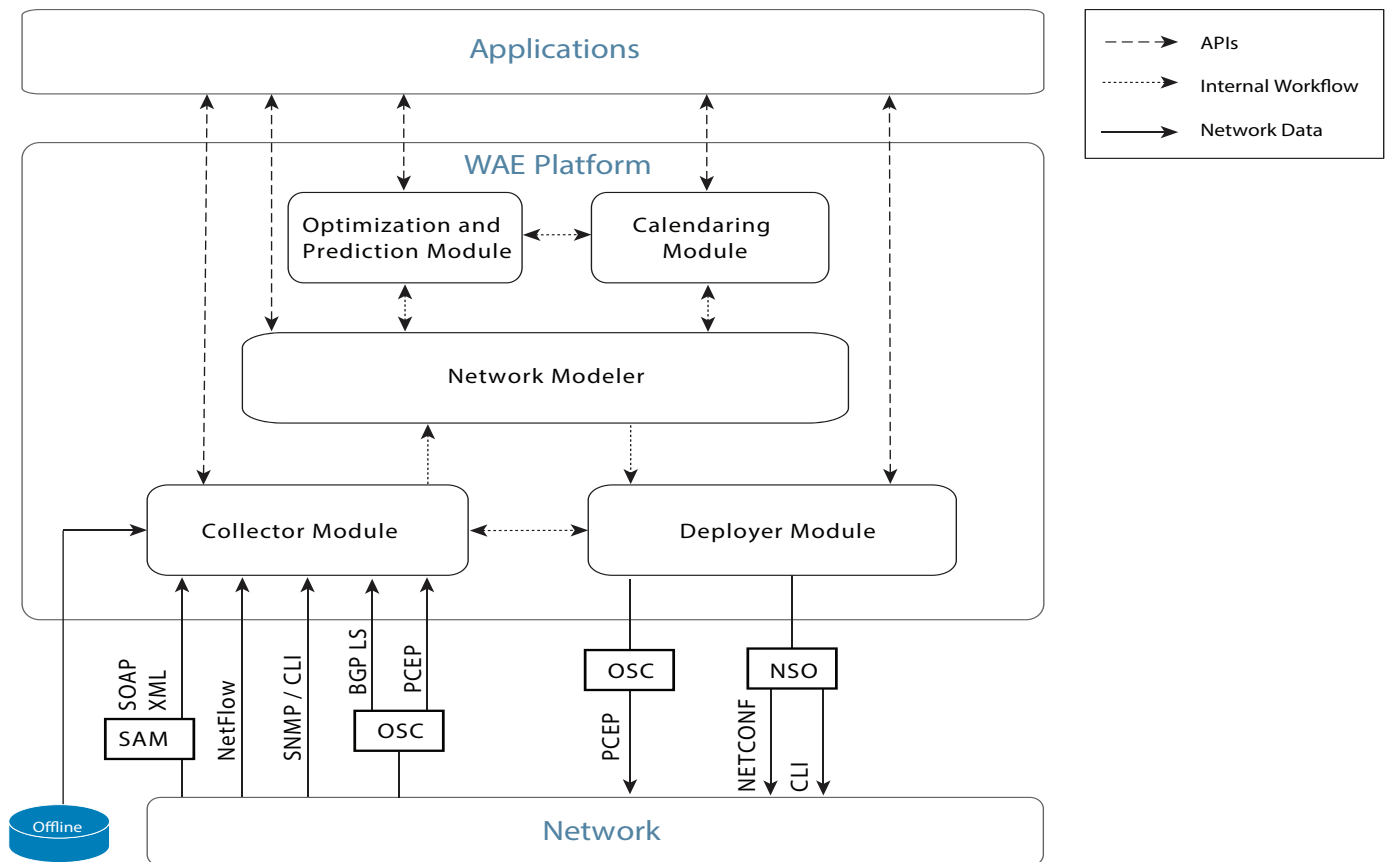
An application could use the output from the Calendaring Module to run as input to the simulations run by the Optimization and Prediction Module.

- Optimization and Prediction Module—Enables APIs to execute global and tactical optimizations, model traffic-engineered LSPs, and perform failure analysis. These simulation tools enable you to model and predict how the network will react to a specified list of changes, as well as suggest additional changes that would produce a more optimal network.

Once satisfied with the optimizations and changes, you can choose to send this new model to the Network Modeler Module.

- Deployer Module—Compares the current network model and the new, updated network model to create a change plan of the differences, and then deploys LSP changes to the network via an OSC or NSO controller. If configured, the applications can be sent deployment status so they can determine when deployments are completed.

Note that the Collector Module uses a Collector server and a WAE Network Interface (NI) server, while the remaining modules use the WAE Core server.

Figure 1-1 WAE Platform Workflow

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Configuration

This guide describes the following configurations.

- [Collecting Network Information](#)—Describes the differences between the collection methods and helps you identify which one is best for you.
- [Deploying Network Changes](#)—Describes how to configure WAE Core server resources, as well as how to configure the REST and Thrift APIs by modifying configuration files. It also describes how to configure the deployment of LSPs.

Environment Variables

This guide uses the following environment variables:

- `$CARIDEN_ROOT` and `$WAE_ROOT`—Location of the installation. By default, this is `/opt/cariden`. These terms are interchangeable.
- `$CARIDEN_HOME`—Directory in which the WAE Design, WAE Live, and WAE Collector executables and binaries are installed. The default is `/opt/cariden/software/mate/current`.
- `$WAE_HOME`—Directory in which the packages are installed. The default is `/opt/cariden/software`.

