Cisco WAE Overview

Cisco WAE Overview

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

Cisco WAE 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 that is placed on it. At a given time, this network model contains all relevant information about a network, including topology, configuration, and traffic 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, or other changes.

The Cisco WAE platform has numerous use cases, including:

- Traffic engineering and network optimization—Compute TE LSP configurations to improve the network performance, or perform local or global optimization.

- Demand engineering—Examine the impact on network traffic flow of adding, removing, or modifying traffic demands on the network.

- Topology and predictive analysis—Observe the impact to network performance of changes in the network topology, which is driven either by design or by network failures.

- TE tunnel programming—Examine the impact of modifying tunnel parameters, such as the tunnel path and reserved bandwidth.

- Class of service (CoS)-aware bandwidth on demand—Examine existing network traffic and demands, and admit a set of service-class-specific demands between routers.

Cisco WAE Applications

Cisco WAE applications work with the Cisco WAE platform software, providing greater insight into your network.

- Cisco WAE Design—The WAE Design GUI provides graphical layouts of the network, showing views of different regions and layers, as well as utilizations and routings. It lets you model, simulate, and analyze

failures, changes, and impact of traffic growth, as well as optimize your network for maximum efficiency. Simulation tools let you perform interactive what-if simulations by:

- Failing objects

- Modifying the network topology

- Creating and changing traffic demands (which simulate traffic flows)

- Modifying routing configurations

For installation instructions, see the Cisco WAE Design GUI Installation Guide.

- Cisco WAE Live—Cisco WAE Live provides immediate and easy access to both current and historical network data. Combined, the Explore, Analytics, and Map tools offer a flexible and interactive means of finding summarized aggregate views or quickly narrowing the search on network data to only relevant details.

  For installation instructions, see Install Cisco WAE Live.

- Bandwidth on Demand—The Bandwidth on Demand (BWoD) application utilizes the near real-time model of the network offered by WMD to compute and maintain paths for SR policies with bandwidth constraints delegated to WAE from XTC. In order to compute the shortest path available for a SR policy with a bandwidth constraint and ensure that path will be free of congestion, a Path Computation Element (PCE) must be aware of traffic loading on the network. The WAE BWoD application extends the existing topology-aware PCE capabilities of XTC by allowing delegation of bandwidth-aware path computation of SR policies to be sub-delegated to WAE through a new XTC REST API. Users may fine-tune the behavior of the BWoD application, affecting the path it computes, through selection of application options including network utilization threshold (definition of congestion) and path optimization criteria preferences.

  For information about enabling, configuring, and properly shutting down the BWoD application, see the "Automation Applications" chapter in the Cisco WAE User Guide.

- Bandwidth Optimization—The Bandwidth Optimization application is an approach to managing network traffic that focuses on deploying a small number of LSPs to achieve a specific outcome in the network. Examples of this type of tactical traffic engineering are deploying LSPs to shift traffic away from a congested link, establishing a low-latency LSP for priority voice or video traffic, or deploying LSPs to avoid certain nodes or links. WAE provides the Bandwidth Optimization application to react and manage traffic as the state of the network changes.

  For information about enabling, configuring, and properly shutting down the Bandwidth Optimization application, see the "Automation Applications" chapter in the Cisco WAE User Guide.