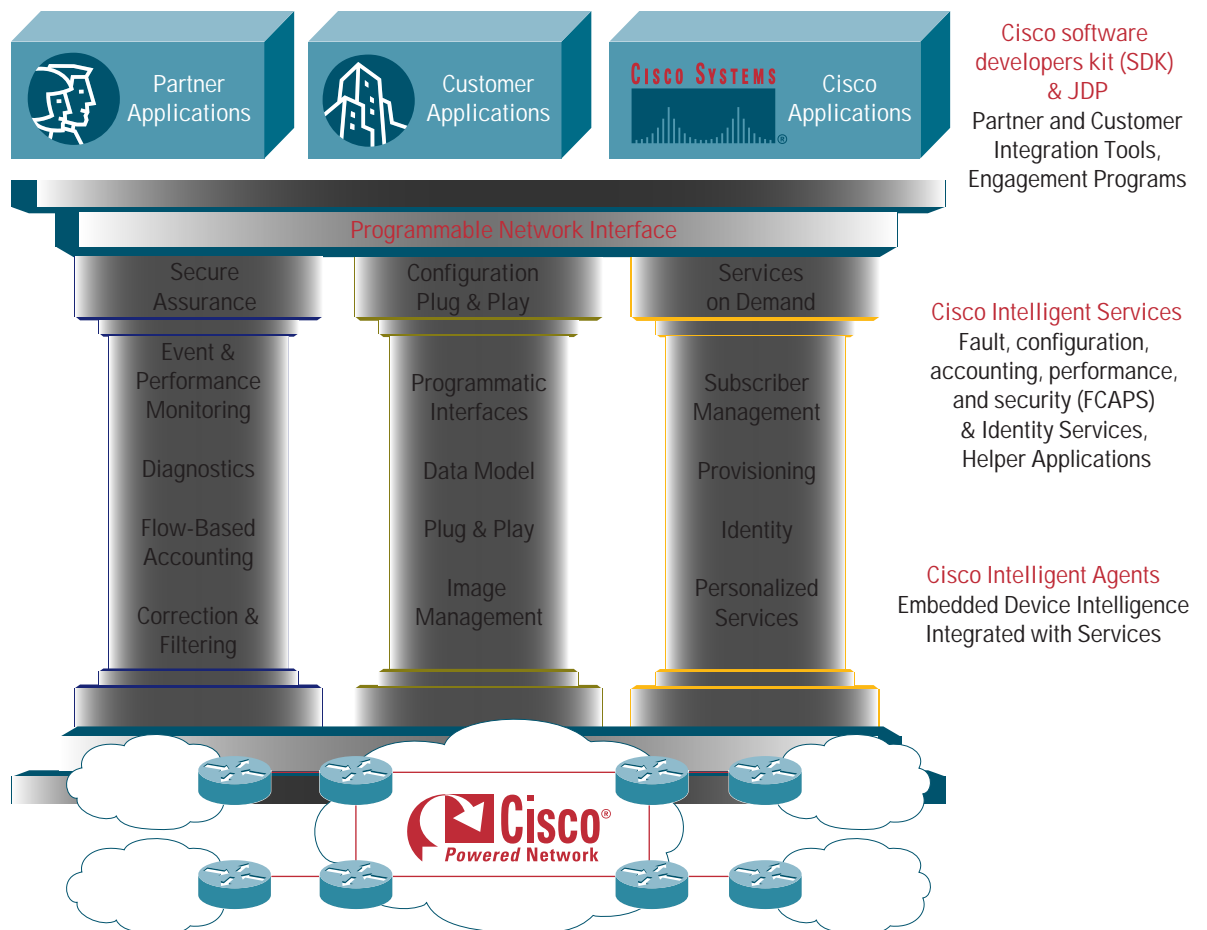


# Cisco CNS Performance Engine 2.1

The Cisco<sup>®</sup> CNS Performance Engine is part of the Cisco CNS Family of software and appliance-based applications, which support scalable network deployment, configuration, service-assurance monitoring, and on-demand service delivery. Cisco CNS intelligent networking technology is tightly coupled with the network elements via embedded device intelligence. Cisco CNS applications reduce capital expenditures (CapEx) by consolidating management functionality into Cisco devices, decrease operating expenses (OpEx) through automation of manual procedures, and increase revenue opportunities by supporting new services and business models. Figure 1 shows the complete Cisco CNS architecture.

Figure 1  
Cisco CNS Architecture





## Product Overview

The Cisco CNS Performance Engine 2.1 simplifies the collection, aggregation, and forwarding of performance and usage data from a wide variety of Cisco element types and data sources according to policies programmed into it by higher-layer applications. The Cisco CNS Performance Engine 2.1 also processes and correlates performance metrics for particular services and application domains, increasing the manageability of those services.

The Cisco CNS Performance Engine 2.1 uses Cisco agent technology, including the Cisco Service Assurance Agent (SAA), as well as more-common sources of performance information, such as Simple Network Management Protocol (SNMP) MIBs, and the Cisco IOS<sup>®</sup> command-line interface (CLI) show commands, to access important performance metrics. In addition, it can collect performance information from other Cisco management applications to further simplify data collection.

The Cisco CNS Performance Engine 2.1 provides an open, publish-and-subscribe Extensible Markup Language (XML) interface, through its use of the CNS Integration Bus, for easy integration into a service provider's existing operations support system (OSS) or into applications that manage third-party performance and service-level agreements (SLAs). With this capability, service providers and independent software vendors (ISVs) can rapidly integrate performance and service-assurance statistics relevant to particular Cisco domains, such as a Multiprotocol Label Switching (MPLS) VPN or voice over IP (VoIP), into their business operations or product offerings.

The Cisco CNS Performance Engine 2.1 is a cornerstone Cisco Joint Development Program (JDP) that allows the user to configure the service provider or the ISV network to more easily manage Cisco networks and services. The product's particular value lies in the new technology domain that Cisco has created, and in bringing integrated solutions to market early with the best third-party applications in the industry.

## Meeting Business Challenges

For today's network providers, understanding the performance and effectiveness of their networks is critical to business success. The age of overprovisioning networks to boost bandwidth already seems in the distant past. The economic climate has influenced network providers to maximize the return on their investments in networks and services. At the same time, as the wide adoption of network applications pushes business-critical data, voice, and video into the same network infrastructure, any performance degradation and downtime can cost businesses tens of thousands of dollars each hour.

To help ensure user satisfaction, service providers and enterprise IT teams must provide guarantees for the level of service they are providing to their customers or users. These guarantees include SLAs, or service-level objectives, that if not met, will result in penalties. Conversely, meeting or exceeding these guarantees can positively affect profitability.

Performance management applications are vital to meeting or exceeding these guarantees. For example, these tools can identify any underuse of particular network paths or nodes, the most active routes through the network, and overloaded points on the network. For optimal use, network providers must optimize their networks and corresponding service parameters based on a detailed picture of the network's performance characteristics. Effective performance management tools can also alert the network managers to a potential problem. By analyzing and identifying trends in performance statistics, these tools can potentially help avert service degradations before they occur. If problems do occur, these performance management tools provide the necessary troubleshooting capabilities to minimize mean time to repair (MTTR) and the impact to the services.



The Cisco CNS Performance Engine 2.1, as an integral part of the programmable network layer, allows network providers to address these business and operational challenges. The product can be used in many different service, network, and technology environments to provide performance statistics from all angles and value-added data processing needed to power performance management applications. As part of the Cisco JDP, the Cisco CNS Performance Engine 2.1 easily integrates with the industry-leading performance and service-level management, rating, and billing applications that service providers depend on to manage and invoice services.

## Applications

A basic application of the Cisco CNS Performance Engine 2.1 is its use as a general-purpose performance-information collector and processor of data from a wide range of network-performance sources. These sources include:

- SNMP MIBs
  - Supports generic MIB data collection. In addition, CNS Performance Engine 2.1 provides value-added processing on several important MIBs, including Cisco class-based quality of service (CBQoS) MIB.
- Remote Authentication Dial-In User Service (RADIUS) call detail records (CDRs)
  - Collects CDRs from voice gateways and Cisco CallManager Express
  - Collects CDRs from Cisco CallManager (new in release 2.1)
  - Collects call detail data and traffic measurements from the Cisco BTS 10200 element management system
- MPLS Ping and Trace

Uses the powerful new MPLS troubleshooting tool in Cisco IOS Software, and provides a programmatic interface.

- Cisco IOS CLI show commands
  - Provides an infrastructure to collect and parse performance data from CLI show commands in Cisco IOS Software.
- Cisco SAA operations
  - Provides round-trip delay, one-way delay, jitter, and packet loss information using synthetic traffic.
- NetFlow data from Cisco CNS NetFlow Collection Engine
- DOCSIS<sup>®</sup> data from Cisco cable modems and cable modem termination systems (CMTSs)
  - Uses cable modem and CMTS association and location information from customer databases
  - Provides raw and summary performance data from cable modems and CMTSs.

The Cisco CNS Performance Engine 2.1 can be programmed using simple XML constructs to gather this data in several different ways:

- In an ad-hoc manner, giving maximum flexibility to the upper-layer application (generic collection mode)
- In a predefined manner for operations that, for example, repeat periodically over the same set of performance variables (template-based collection mode)
- A threshold crossing event detected by CNS Performance Engine 2.1 can also trigger new data collection to ensure information relevancy.
- Using higher-level constructs that do not require the requestor to have detailed knowledge of the data sources or that call on some processing locally in the CNS Performance Engine 2.1 to increase the value of the information forwarded to the requestor (technology-specific mode)



Consequently, the Cisco CNS Performance Engine 2.1 can be used in many network environments to retrieve and present performance and usage-related information to the higher-layer OSS.

As an example, the Cisco CNS Performance Engine 2.1 provides critical end-to-end service instrumentation for long-distance VoIP network environments. Specifically, the product has the intelligence to process and correlate all four legs of an end-to-end VoIP call as it traverses the network and presents relevant performance statistics to any OSS that has been integrated with it. Examples of performance statistics include:

- Average call success rate
- Quality of service (QoS) for each call
- Call volume through a particular node on the network
- T1/E1 utilization on VoIP gateways

Another application of the Cisco CNS Performance Engine 2.1 is MPLS troubleshooting. CNS Performance Engine 2.1 supports MPLS ping and traceroute commands via an IosCliOpsCollector. With the new dynamic event trigger feature, the user can configure the CNS Performance Engine 2.1 to support workflows for MPLS troubleshooting, such as:

- Trigger a collector to execute periodically the MPLS LSP ping
- Configure thresholds for ping failure for the above collector
- Start trace utility automatically for the same LSP/VRF if the LSP generates a ping failed notification ping command.

This support feature proactively monitors and alerts potential problems in an MPLS core network.

Table 1 provides a summary of Cisco CNS Performance Engine 2.1 feature-based benefits.

Table 1 Cisco CNS Performance Engine Benefit Summary

Feature	Benefit
Single, flexible interface type	<ul style="list-style-type: none"><li>• Eases integration, reduces OSS integration costs</li><li>• Provides access to a wide range of performance statistics</li><li>• Allows users to adapt SLAs dynamically</li></ul>
Hierarchical scaling	<ul style="list-style-type: none"><li>• Increases visibility of network performance at a reduced cost</li></ul>
Greater control over SNMP performance polling	<ul style="list-style-type: none"><li>• Allows investigation for detailed diagnostics for configuration design fault isolation</li><li>• Generates alerts when thresholds are crossed for proactive service management</li><li>• Collects additional data when thresholds are crossed, if programmed to do so</li></ul>

#### Network Element and Cisco IOS Software Support

The Cisco CNS Performance Engine 2.1 supports all Cisco devices for MIB data collection. For VoIP RADIUS data collection, the CNS Performance Engine 2.1 supports Cisco IOS Software 12.2-based releases on Cisco VoIP gateways. For DOCSIS data collection, the CNS Performance Engine 2.1 supports Cisco cable modems and CMTSs, as well as other CMTSs and cable modems that are compliant with DOCSIS.

## Technical Specifications

Operating system: Solaris 2.8

Recommended hardware:

Solaris: Sun Netra 20

For current Solaris-based network management product hardware options, refer to the Sun Cisco Optimized Platform

Recommendations Table for hardware and part numbering ordering information.

## More Information

For more information, read the product documentation available at:

<http://www.cisco.com/en/US/products/sw/netmgts/ps3795/index.html>



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