



The WebEx Operational Support System

WebEx Communications Inc.
3979 Freedom Circle, Santa Clara, CA 95054, U.S.A.

Corp.: +1.408.435.7000 **Sales:** 1.877.509.3239

www.webex.com

Introduction

WebEx Communications developed the MediaTone Network, a global, dedicated infrastructure, to deliver 24x7x365 collaboration services to its large and increasing user community. The MediaTone Network resembles a modern telecommunications carrier and very large Internet Service Provider combined into one. In order to manage this infrastructure, WebEx employs a comprehensive Operational Support System (OSS) that touches and synchronizes every session, data path, and device comprising the service. This paper illuminates the process and benefits of the system while highlighting some of the important solutions in everyday use.

What is an Operational Support System?

An OSS, is a suite of software designed specifically to manage a large network infrastructure, connecting individual sub-systems similar to a power plant management system with high-level and drilldown viewpoints. Activities essential to the smooth operation of the network and all related services are coordinated between responsible parties. A specialized database continuously captures data to reconcile these activities, which may be queried to shore up incident processing or to perform forensic analysis on past events. Ultimately, the data is synchronized to customer service and support lifecycles, providing a highly managed environment suitable for mission-critical business use.



The WebEx OSS

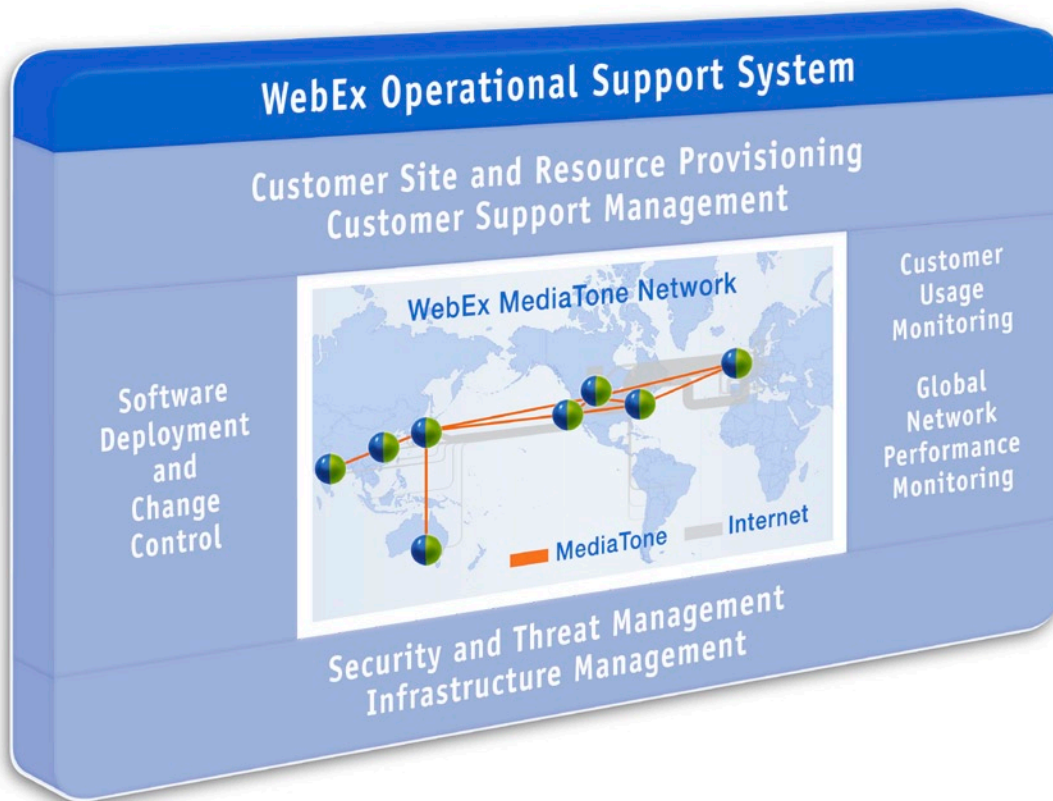
To ensure continuous and reliable service to its customers, WebEx developed a custom management platform using technology standards that are in wide deployment today. On top of these standards, WebEx engineers developed an interoperating set of modules. This is the WebEx Operational Support System. The major functions are illustrated below:

The WebEx Operational Support System surrounds the MediaTone Network with carrier-class management tools to ensure 24x7x365 availability, reliability and security.

Scaling services to meet user growth and system demand is accomplished by the interplay of WebEx software deployment and change control with sound usage and performance monitoring. This enables WebEx to grow its network without jeopardizing existing customers or impairing the service.

Provisioning Customer Sites and Resources

Every WebEx customer receives a branded site customized to look and feel like their company's website. The customer's assigned URL "company.webex.com" is provisioned within MediaTone and may be found on the Internet. This serves as the portal where the company holds WebEx sessions and where attendees and hosts log in. The WebEx applications the customer ordered are made available to the customer's administrator who may then add users and other corporate information to the site. Behind the scenes, the WebEx OSS enters all of this information into a common database, keeping a record of this setup, the structure of the website, and all other service data.



The WebEx OSS in conjunction with our third-party-certified change-control procedures makes it possible to maintain WebEx as a robust, always-on service with the availability and reliability of a large telephone company.

Customer Support Management

Once the customer site is provisioned, the database now tracks all support inquiries and unresolved issues such as minute look and feel changes, open training, and other provisioning issues. In addition, the database links sales, support, and operations, enabling WebEx customer support teams to quickly coordinate issue resolution,. These OSS applications give WebEx support teams the tools they need to handle these issues. All actions and inquiries are reconciled in a common operations database to ensure complete coverage of each issue and to provide visibility to management.

Understanding Software Deployment and Change Control

Because of the enormous scale of the WebEx MediaTone Network, it's often necessary to implement changes, revisions and maintenance cycles on a regular basis. The complexity of these changes varies from the very simple to the ultra-complex, depending on the software development cycle. To guarantee continuous operation and a progressive forward movement of changes, WebEx instituted a rigorous change-control process, governed by documented procedures and audited by both WebTrust and SAS-70 Type II certifications. These procedures guarantee that software upgrades, site changes, database migrations and server/switch deployments will not degrade or impair existing services. During these changes, the WebEx operations team moves the existing service to a Global Site Backup site and performs the upgrades on clusters not currently in use, ensuring a robust continuation of services. Once the upgraded clusters have been fully tested offline, they are switched into live service and the backup site is idled.



GlobalWatch is a tool available to your WebEx Administrators to see the big picture of their user activity. With it, they can drill down into a single user or meeting, or see all meetings taking place. GlobalWatch allows rapid diagnosis of any problems that arise, providing one more level of comfort to administrators and users.

Monitoring Usage and Global Network Performance

For a network provider such as WebEx, it is necessary to have visibility into the infrastructure—from the highest node level to an internal switch state. For this, WebEx uses several interoperable modules that provide visibility and control to responsible individuals. Two of these are critical OSS components: GlobalWatch and WeatherMap.

GlobalWatch

GlobalWatch is a service monitoring application that enables a customer to drill down into any current, ongoing WebEx session taking place at any given time on that customer's portal. That the customer can see actual participant names, their path into both the Internet and MediaTone, as well as a host of live parameters for performance and session status.

Designed for WebEx customer site managers, GlobalWatch quickly shows participants' locations, if there are Internet access problems, and the density, distribution and frequency of that company's WebEx sessions. This is very helpful for companies that steeply scale their use of WebEx.

GlobalWatch gives site managers the ability to:

- See all meetings in-progress.
- Zoom in on the user's detailed meeting stats.
- View and analyze all scheduled and past meetings.
- Track and analyze usage graphically.
- View all meetings by site.
- Identify peaks in service usage.
- Monitor solutions for systems administrators.

WeatherMap

The WebEx operations team has, within the OSS, the capability of viewing minute details about the current operation of the service. This capability, called WeatherMap, is designed to provide WebEx administrators a geographical view of meeting distribution. This enables the WebEx operations teams to drill into meetings and track network problems affecting sessions in-progress. This also gives managers the ability to predict congestion-related phenomenon, identify its source and to redirect resources upon demand.



Benefits of the WebEx OSS

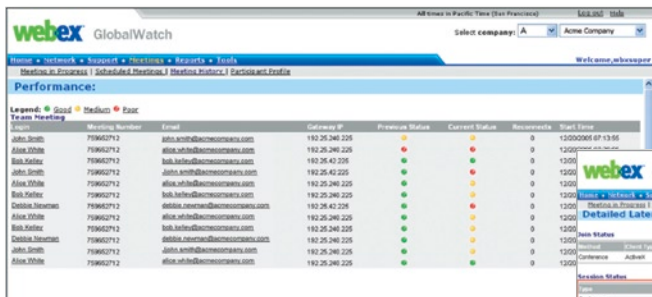
On many occasions, WebEx has used its Operations Support System to assist customers with service issues—whether they were internal or on the MediaTone network. Operating a dedicated network allows WebEx to use its audited standards and practices to maintain high security, availability and reliability. Accelerated problem resolution is just one advantage to using such a global, private network, in contrast to troubleshooting and problem solving such diverse issues through public Internet Service Providers.

Diagnosing Service Issues

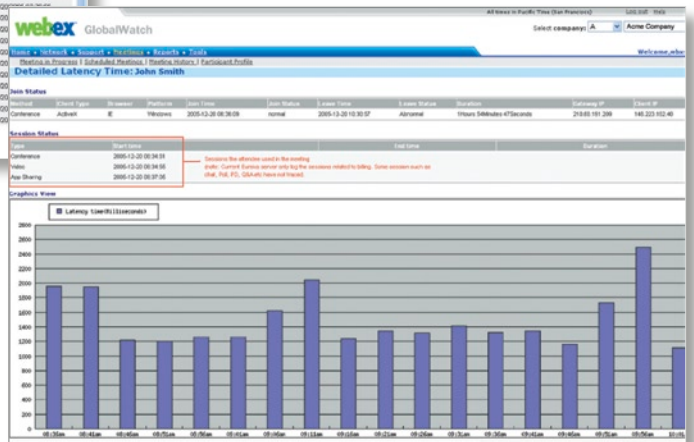
Using Global Watch, the company's WebEx administrator may monitor all meetings on a regular basis. If the helpdesk receives complaints about delays or performance, the administrator must determine the scope of the problem and resolve it quickly. With respect to WebEx meetings, GlobalWatch zooms in from the highest level to the individual participant level to quickly determine both the number and cause of reported problems. The screen shot below shows both the high level and individual participant's performance.

The meetings list view shows meeting ID numbers, login name, e-mail address, previous and current status with color coded indicators, and the I.P. address of the participants in all meetings for the company. This view enables administrators to quickly scan current status, see where users may be located (by I.P. address), and identify the contact information. The lower screen shows the administrator zooming in on a specific participant and inspecting trended latency graphs to monitor performance trends. An administrator may then either contact the participant directly about the reported problems, or work directly with IT staff at the location.

One Company's Meetings in Progress Showing Performance



One Attendee's Latency

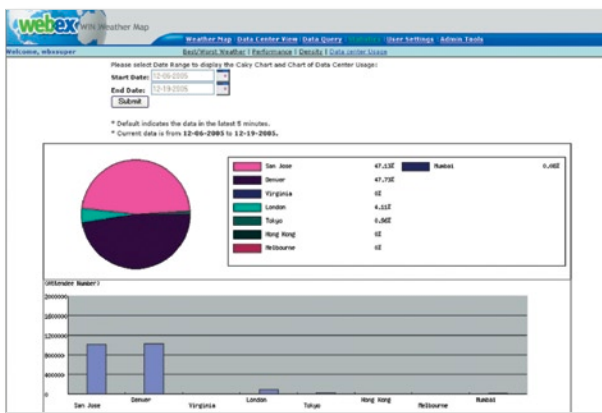


The GlobalWatch application is very useful for both the customer administration team and WebEx customer service to catch problems early and isolate them within the organization. Generally, issues may be isolated by location and resolved to a particular sub network only after identifying recent changes in performance.

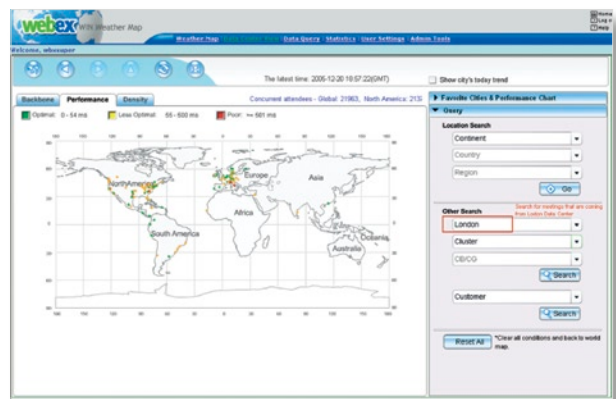
Problems that could potentially affect multiple WebEx customers may be more easily solved using WeatherMap.

WeatherMap is a global network version of GlobalWatch that is capable of seeing all meetings, worldwide. It stores history and maps to WebEx global data centers for geographic fault isolation. With WeatherMap, WebEx service personnel can graph and trend many different statistics that point toward potential problems related to burst behavior on the MediaTone Network. MediaTone network managers continuously conduct routine performance analysis to maintain a preemptive posture with regard to varying demand on the service. As a function of this preemptive posture, the WebEx MediaTone Network maintains capacity below 50%, to sustain over-provisioned bandwidth. The screens below show some of the capabilities of WeatherMap.

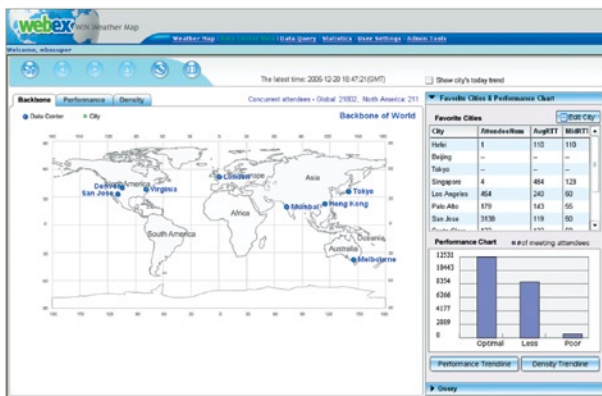
Data Center Usage for the past 7 days

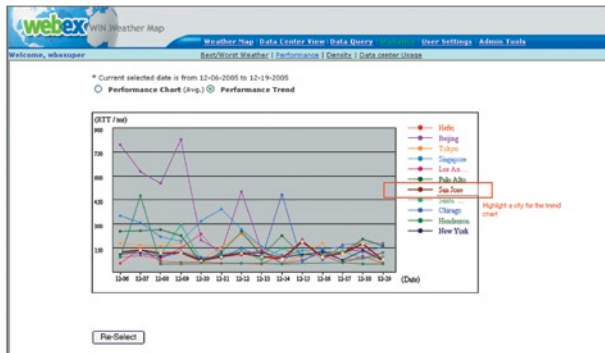


Search by Data Center



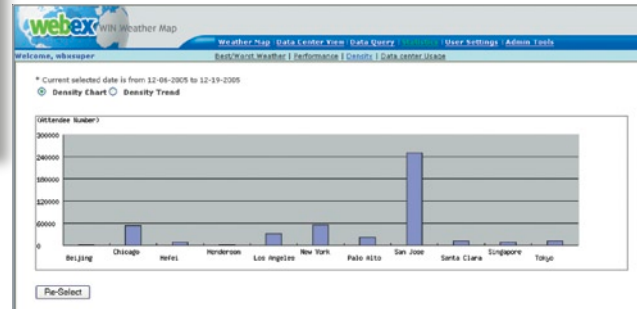
Weather Map Data Center View





Performance Trends for Selected Cities

Performance Chart for Selected Cities



Security and Threat Management

WebEx continuously maintains and enforces the most stringent security policies to guarantee the credibility of its collaboration services at all times. Along with rigid WebEx change control policies and deep firewalls, the OSS continuously monitors the state of software modules, all inbound and outbound employee data, and customer access to ensure WebEx service integrity.

WebEx mitigates the two main threats—virus/worms and unauthorized access—via encrypted access methods, complex admin passwords, and router access-control lists for all entry points onto its MediaTone network. With such extremely well-enforced and disciplined maintenance procedures, it is next to impossible for a rogue program to run inside MediaTone. Through specific modules in the OSS, WebEx monitors and tracks these processes daily.

Maintaining Infrastructure

The WebEx MediaTone Network bears some similarity to large enterprise networks and wide-area networks. The infrastructure and equipment, combined with fiber circuits that span the globe, must be kept running soundly. WebEx network and collaboration clusters reside on a private intranet within secure data centers that peer with the public at the largest Internet exchanges. Managing these nodes requires conventional Internet working procedures, policies and equipment, such as routers, gateways and access multiplexers. The WebEx network operations staff maintains full CCNE and CCIE certifications, in addition to security professional certification, to perform daily upkeep and maintain the strictest security. Again, these procedures involve OSS—to maintain records and reconcile all procedures for change control, threat management and support activities—providing continuous visibility to management.



The WebEx OSS has provided tactical as well as strategic support for a sometimes very complex meeting tapestry. These two case studies represent prominent examples of its usefulness in solving day-to-day problems that ordinarily crop up in complex collaborations.

OSS Case Studies

1. Resolving impaired collaboration performance.

A very large WebEx customer with an enterprise-wide deployment of all services experienced impaired collaboration performance behavior. The IS group responsible for supporting WebEx within their enterprise received a number of helpdesk calls beginning on a specific date. Until then, this customer experienced only minor problems from time to time, which were solved quickly on a case-by-case basis. In this case, however, the quantity and frequency of complaints grew to more than 10 incidents each day.

The WebEx administrator asked for assistance from the WebEx Customer Service Group. They responded by providing him access to the WebEx OSS GlobalWatch application. With this web-based program, the customer's WebEx administrator was able to see an overview of all the company's WebEx meetings, hosts and participants taking place at the time.

Here is how the customer defined and solved the problem using the WebEx OSS –

1. The customer's WebEx administrator combined GlobalWatch with WeatherMap to isolate a single city for high-latency behavior against all other locations.
2. The WebEx administrator and IS managers investigated the location in question.
3. They determined that a single router was the last item changed at the location in question.
4. Further investigation led to the discovery that an updated script affected the traffic coming from that location.
5. The router script was reverted to a previous working image, solving the problem.
6. GlobalWatch subsequently reported normal operation and lower latency for the location in question.

After implementing the remedy, all WebEx sessions in that location returned to normal latency, resulting in a cessation of helpdesk calls. This completely exonerated the administrator and saved the company time and lost effort in their collaboration which they have come to depend on for their business growth.



2. Scaling down latency.

This situation involved an increase in service provisioning for an existing customer. The customer was concerned about service-wide latency as it added new users. This customer used GlobalWatch to gather statistics on all meetings and graph latency in numerous samples. Plotting the analysis data revealed that WebEx easily met or exceeded the minimum latency requirement. The results of this analyzes reassured the customer that WebEx would fulfill its requirements for a full deployment collaboration solution.

Conclusion

The WebEx MediaTone Network was designed to scale and meet the ever-increasing needs of a growing user base. WebEx architects planned for this growth by conceiving and implementing a full-scale Operational Support System, similar in scope and breadth to a large telecommunications carrier. Every day the WebEx OSS proves its worth in sustaining WebEx as the leading, business software-as-a-service provider.

Worldwide Sales Offices:

Americas & Canada

Tel: +1.877.509.3239

AmericasInfo@webex.com

China (HK)

Tel: + 852.8201.0228

AsiaPacInfo@webex.com

Europe, Middle East & Africa

Tel: + 31 (0)20.4108.700

europa@webex.com

India

Tel: 080.2228.6377/17030 9330

sales@cyberbazaarindia.com

United Kingdom

Tel: 0800.389.9772

europa@webex.com

Japan

Tel: + 81 3 5501 3272

JapanInfo@webex.com

Australia & New Zealand

Tel: + 61 (0)3.9653.9581

AsiaPacInfo@webex.com

