


Cisco Element Management Framework v3.1 CORBA Gateway Solution



For wide-scale service deployment of broadband access equipment and technologies such as digital subscriber line (DSL), IP, ATM, Frame Relay, cable modems, and wireless local loop to be successful, the network equipment must be complemented with a carrier-class management solution. This solution must be capable of scaling as the network grows, maintaining high performance levels as the number of network events increase, and providing simplified integration with third-party systems.

Introduction

To meet service providers' expectations for integrated operational support systems (OSS), Cisco Systems, the worldwide leader in networking for the Internet, designed the Cisco Element Management Framework (EMF) CORBA Gateway solution. The components of this solution enable equipment vendors and systems integrators to access the full functionality of Cisco EMF Element Managers across the industry-standard CORBA "bus."

Service providers and systems integrators may also use the CORBA Gateway in order to build Web-based GUIs in order to streamline the user interfaces with their operational procedures.

The Cisco EMF Version 3.1 CORBA Gateway provides full support for integrating Cisco EMF Element Managers with fully automated flow-through provisioning systems. Specifically, this version adds support for the CORBA notification service, enabling events to be forwarded to operations support systems (OSSs), as well as integration with sophisticated provisioning OSSs for proactive capacity management.

The Cisco EMF CORBA Gateway solution is a part of the Cisco EMF Integration Interfaces product family, which also includes the Cisco EMF Northbound Event Interface for fault management using Simple Network Management Protocol (SNMP) traps and ASCII log files.

Why CORBA?

CORBA is an open standard for distributed open computing that provides flexible cross-platform interoperability among diverse computing systems. CORBA, at a basic level, is a mechanism for ensuring different applications, written in different programming languages on different compatible and incompatible computer operating systems, can communicate simply; as if they were all running on the same operating system on the same computer, written with the same programming language. CORBA is fast becoming the integration mechanism of choice for carrier-class management systems, displacing complex telecommunications management network (TMN) interfaces in many service provider organizations.



Key Applications

The Cisco EMF Corba Gateway is particularly suited for integrating Cisco EMF Element Management Solution with key parts of service providers' operational support infrastructure.

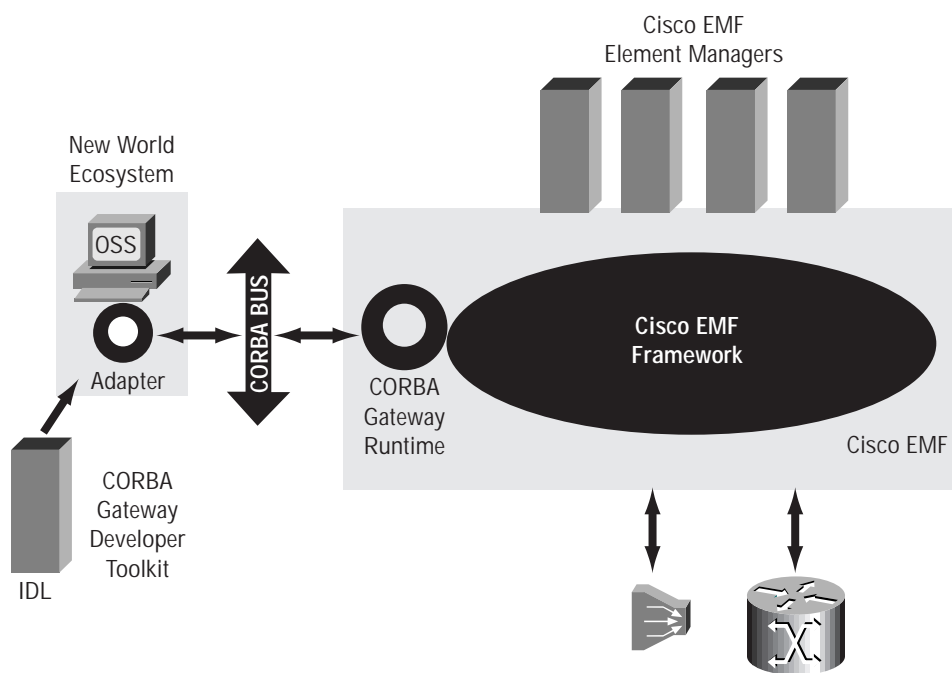
Cisco EMF 3.0 Gateway release focused primarily on provisioning systems. Cisco EMF 3.1 CORBA Gateway completes the provisioning support and introduces fault-management support. Future releases will complete fault-management support and include enhanced performance management support.

The Cisco EMF CORBA Gateway Product Suite

The Cisco EMF CORBA Gateway product suite consists of the Developer Toolkit and the Runtime Gateway (only the Runtime Gateway is required for deployment in a managed network):

- Developer Toolkit—An Interface Definition Language (IDL) specification, which systems integrators and software houses can use to develop the adapter software components needed to integrate OSSs with Cisco EMF Element Managers or build new Web-based applications that make use of Cisco EMF capabilities
- Runtime Gateway—Included with Cisco EMF and incorporates a runtime license for the market-leading Iona Orbix2000 ORB. The Runtime Gateway runs on the Cisco EMF Server allowing the systems integrator's adapter module or Web application to run anywhere in the CORBA Bus, as shown in Figure 1.

Figure 1 Cisco EMF Version 3.1 includes the CORBA Runtime Gateway



Features and Benefits

The Cisco EMF CORBA Gateway enables integration of Cisco EMF Element Managers into a service provider's OSS. This facilitates reduced cost of operations by flow-through provisioning. It also facilitates reduced maintenance cost by aggregating all fault and performance data in systems dedicated to correlation, root cause analysis, and pre-emptive maintenance. An integrated OSS enables faster service creation and higher revenues by service differentiation and shorter time to market with new services.



Web-based GUIs can also be built using the Cisco EMF CORBA Gateway to streamline the EMS user interface to the service provider's operational procedures.

CORBA is an Industry Standard

By embracing the CORBA industry standard, service providers reap the benefits of programming language, operating system, and location independence. There is a large body of trained developers to recruit from, and the CORBA programming model is well understood. CORBA development tools are commercially available. Using an established industry standard such as CORBA increases programmer productivity and reduces cost and time to market for developing the integrated OSS.

Reliable Transport

The CORBA Internet Inter-ORB Protocol (IIOP) is carried over the Transport Control Protocol (TCP), providing reliable end-to-end transport. This provides increased quality of service (QoS), for example compared to the User Datagram Protocol (UDP)-based SNMP, where messages may be lost by the transport protocol. Using CORBA and IIOP provides improved QoS.

Market-Leading Iona Orbix2000 Included

The Cisco EMF server includes a runtime license for the market leading Iona Orbix2000. Orbix2000 is compliant with CORBA Version 2.3 (with certain CORBA 3 additions), as well as IIOP Version 1.2 (although earlier versions of IIOP may be used for backward compatibility with ORBs from other vendors.) Using a widely deployed CORBA product gives the benefit of increased reliability. The fact that Orbix is bundled with Cisco EMF also reduces the deployment cost for the service provider.

Although Cisco EMF uses Iona Orbix, the client systems may be developed using any commercial or non-commercial CORBA development environment.

Cisco EMF CORBA Gateway Provides Access to Entire EMS Feature Set

The CORBA Gateway provides access to all the features of the EMSs that are installed on the Cisco EMF Server. It enables configuration-management functionality such as inventory upload and service activation, as well as fault management functionality, alarm list synchronization, and asynchronous events. In general, anything you can do from the GUI you can also do using the CORBA Gateway. This is made possible by enabling access to all the objects in the Cisco EMF database. Cisco EMF EMSs represent everything as objects, physical resources such as chassis, module, and port, as well as logical resources including connection, subscriber, and alarm. The Cisco EMF CORBA Gateway provides the following object operations:

- Object creation—For some service activation scenarios, such as creating a connection between two interfaces.
- Object attribute read—For inventory upload, where an object attribute may hold information such as interface IP address, QoS parameters, and so on.
- Updating object attributes—Such as the modification of the QoS parameters of a router interface.
- Object deletion—sometimes used for service de-activation.
- Invoking actions on an object—This has the same effect as clicking a button on the GUI, and may trigger actions such as software download, configuration backup or restore, or creating a connection between two interfaces.
- Asynchronous events—these events provide notification for a new alarm or that an alarm has been acknowledged or cleared, or that a replaceable module has been pulled out or inserted into a router.

A complete OSS integration interface provides benefits including reduced cost of OSS ownership.

IDL Interface is Generic

A CORBA interface is specified using a programming language independent Interface Definition Language (IDL). The Cisco EMF CORBA Gateway Software Development Kit includes the IDL specification with the features specified above. The IDL specification is generic, so it is the same for all Cisco EMF EMSs; hence installing a new EMS on a Cisco EMF server does not change the IDL specifications. As there is no EMS specific part, as the IDL is compact and stable. The IDL specification supports flexible programming techniques, providing both synchronous and asynchronous interfaces. A multitude of Cisco EMF EMSs offering the same integration interface leads to reduced cost of integration, development, and reduced time to market.

Benefit Summary

The benefits of the Cisco EMF CORBA Gateway include:

- Reduced time to market for integration development and new service introduction
- Reduced integration development cost
- Reduced cost of OSS ownership
- Improved QoS for end customers

System Requirements

The Cisco EMF CORBA Gateway is included with, and runs on the same workstation or server as the Cisco EMF Software. A Sun or SPARC-compatible workstation or server running Solaris 2.6 is required. Please refer to the Cisco Element Manager documentation for specifications.

The system requirements for client systems and development systems will depend upon factors such as which CORBA ORB is used, which other systems will be running on the same workstation or server (such as other OSS), and the requirements of your development environment.

Training

Cisco offers a five-day training course for developers wishing to develop Cisco EMF CORBA Gateway client applications. The course is targeted at systems integrators, network management system vendors, and service providers.

Leverage the Cisco Broadband Access Management Solution

Taking advantage of the features and benefits of Cisco EMF CORBA Gateway positions your company for a unique value proposition. As shown in Figure 1, Element Managers developed using the Cisco EMF Management Toolkit interact seamlessly with the Cisco EMF to report events as they occur in the network. By integrating these Element Managers via the Cisco EMF CORBA Gateway to upstream OSS, service providers can then gain access to all element information and statistics to provide an integrated OSS and business information strategy. This will provide service differentiation by offering profitable QoS metrics to service provider customers using the Cisco EMF product suite as the foundation and the Cisco EMF CORBA Gateway as the integration channel.

Cisco offers a complete broadband access service-aware element-management solution encompassing a full suite of multivendor, multiservice management applications designed to meet the challenges that service providers face in their business today. The Cisco solution allows service providers to improve knowledge, efficiency, and productivity in their network while adding new services and subscribers and growing profits.



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