

Cisco Services Bus: Enable Any-to-any communication to optimize and monetize Network Intelligence

What You Will Learn

This overview discusses the overall architecture and main building blocks of the Cisco Services Bus. It also examines how the solution interworks with policy, analytics, and other network elements. using an internal orchestration and complex event-processing engine to support advanced mobile Internet services and use cases.

Challenge

Mobile operators worldwide are seeing tremendous growth in mobile-data subscriptions and bandwidth usage. The emergence of free, “over-the-top” and off-net applications and services is affecting their return on investment (ROI) because consumers can use these applications and services over the operator’s network, without providing even an incremental usage fee to the mobile operator. Unless they find a way to monetize and add value to these applications, mobile operators risk becoming simply a bandwidth “bit pipe” provider. As a result, it is critical for mobile operators to invest strategically in their network assets, so they can launch new services moving to a B2B2C (Business to Business to Consumer) model as compared to the normal B2C (Business to Consumer) model.

To do this, they face challenges from three different fronts:

Monetization Challenges

- It can take 6 to 18 months to get a new use cases up and running.
- There is no synergy between use cases. In general, building one use case does not always help build the second one.
- There is no single use case that is identified as a highly anticipated application.
- Operators want to be able to quickly create new use cases.
- Operators want the ability to quickly modify use cases when they see what direction they want to take.

Application and Developer Challenges

- There is restricted access or no access to the operator network.
- There is no real-time access.
- Application developers do not want to understand the operator network and topology.
- It is difficult to correlate information from multiple sources and vendors.
- There is no standardized interface to operator applications and services.
- There is no single entry point to extract information from the IP network.

Operator Challenges

- Generally, services take 6 to 18 months to become operational.
- The operator infrastructure must remain secure.
- How service-level agreements (SLAs) are applied across multiple elements.
- How use cases affect the OSS (Operations Support System) and Business Support System (BSS) and the other way around.

In addition, as operators search for ways to protect, control, and grow their subscriber base, they also need to segment their uses and address the unique and diverse needs of each subscriber. The current policy and charging control solutions do not meet all these requirements, because they do not provide proper allocation of network resources and the ability to quickly deploy and manage services.

Business Benefits

Cisco has defined a next-generation subscriber and policy management architecture, the Cisco Services Bus, that collects and helps monetize the intelligence available in the network. The main objective is to provide simple access to, and correlation of, intelligence from the network, including:

- Next-generation policy and subscriber management that extends service control and correlation to multiple elements of the network, including service-creation tools to create and configure services at both the control and enforcement layers of the network
- Business and network analytics that allow historical-trend and real-time predictive policy decisions
- A “network bus” architecture that provides network data collection and aggregation, along with orchestration that accelerates available decision-processes information
- Business-to-business-to-consumer (B2B2C) and Web 2.0 business models that securely expose network capabilities and information to third-party application and content providers

Solution

As illustrated in Figure 1, Cisco Services Bus is a framework that provides network and subscriber abstraction via mediators from multiple network elements, such as the Cisco Packet Core, ASR 5000 Series platforms, CSON (Cisco Self-organizing Network), QPS for policy and charging rules function (PCRF), Cisco Services Platform (CSP) in the virtualized Gi LAN solution, WAN Orchestration, Cisco VideoScape™ solutions, Radio Access Network (RAN) congestion detection entity, just to name a few. It will expose network and subscriber information in a controlled manner to the external elements, such as the application service provider (ASP) and content provider through the API gateway, enterprises, and so forth.

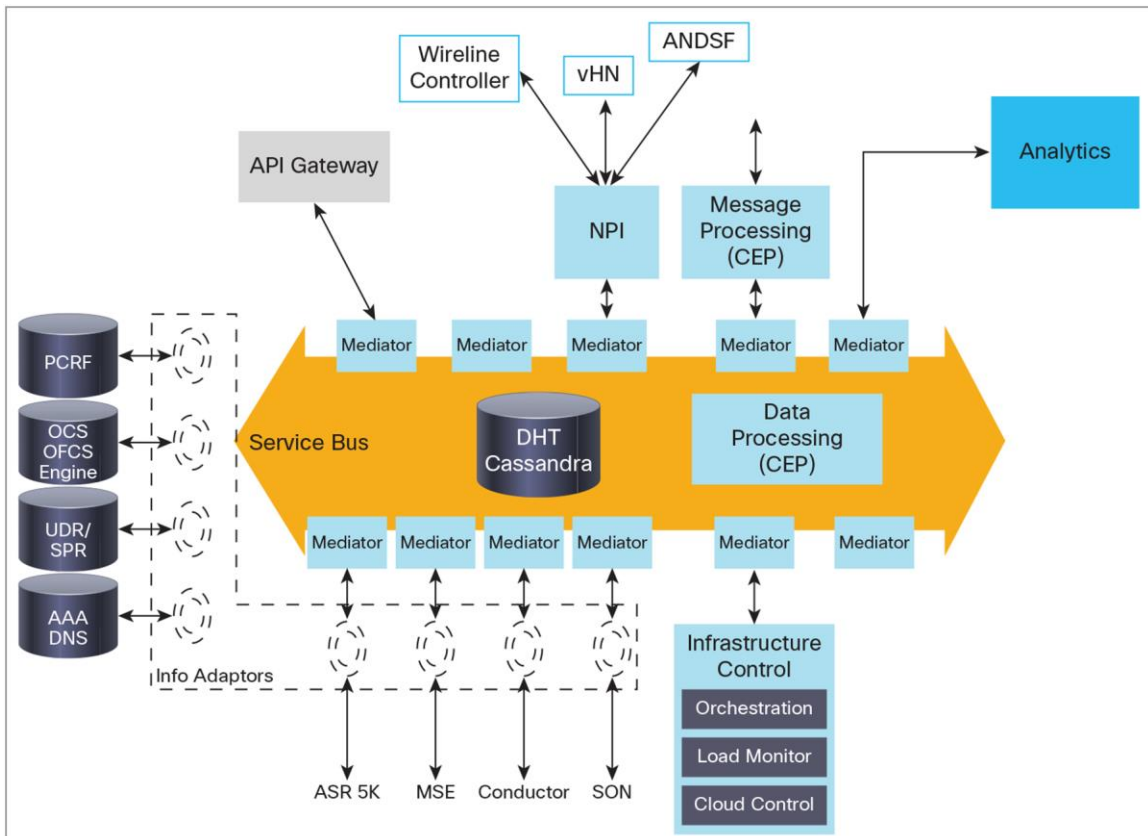
Cisco Services Bus introduces business and network analytics capabilities that support both historical-trend and real-time predictive policy decisions through the PCRF. The analytics solution uses real-time data from the network through the abstraction layer (CSB) to dynamically modify policies using a policy-feedback system. The information processed through the real-time predictive analytics will indicate where and why problems exist; where improvements can be made; what websites, services, and applications subscribers are using; and how subscribers are using the network, service, or even individual connections. This information is used to dynamically modify policies through the PCRF, which get fed back to the network for enforcement. The architecture effectively creates a feedback loop between the analytics engine and PCRF.

Increasingly, over-the-top (OTT) players are selling to mobile operator customers, and they are doing it over the operators' networks. The next-generation policy and subscriber management architecture allows operators to capitalize on new two-sided, B2B2C models by taking advantage of network intelligence to offer value upstream and help other members of the ecosystem deliver a more targeted (that is, personalized and customized) experience. Using this approach allows operators to create offers that suit the needs of their customers while also sharing the value of the network with the OTT providers.

To support B2B2C and Web 2.0 applications, the abstraction layer consists of an API gateway that provides a single entry point to network services for operators and application developers. The gateway also simplifies the interface to existing OSS and BSS systems. This provides:

- An open and easy way to expose network capabilities for enabling services
- Quick time to market for application developers
- Lightweight development and deployment
- Revenue-sharing potential with OTT applications

Figure 1. Cisco Services Bus Logical Architecture



Intelligent Networking

The Cisco network elements used in this solution provide turnkey services that can be delivered using a virtualization environment on the x86 hardware. The Cisco Services Bus offers the network, service and subscriber abstraction layer, which exposes the network capabilities of Cisco ASR 5000 Series and Cisco 5500 platforms, including the Gateway GPRS Support Node (GGSN), Packet Data Network Gateway (PGW), Home Agent, and Home NodeB Gateway (HNB-GW). It can be expanded to include other Cisco products, such as the Cisco ASR 1000 Series, Cisco ASR 9000 Series, MSE, Cisco Medianet (MSI client), Cisco Carrier Routing System (CRS), Cisco Videoscape platforms, SON and probes. This flexibility supports more innovative services and helps monetize and optimize mobile operator networks' assets.

The Cisco Services Bus, exposes the network capabilities (subscriber, device, session, and flows) of the following Cisco ASR 5000 Series and ASR 5500 StarOS functional elements:

- PGW
- GGSN
- Home Agent
- HNB-GW
- Enhanced Charging Services (ECS) in-line services
- Network Address Translation (NAT) and Firewall (FW)

In addition, the Cisco Services Bus interworks with the Cisco ASR 1000 Series to extract the NAT binding record and update using Cisco Netflow v9. This is used by some service providers to provide the NAT functionality at the Gi or SGi network.

Furthermore, the Cisco Services Bus connects with other Cisco products, including:

- Cisco Medianet (on the client, Cisco ASR 1000 Series platforms, Cisco ASR 9000 Series platforms, and the video and audio end points)
- Cisco Videoscape platforms (e.g., through their conductor)
- Access Network Discovery and Selection Function (ANDSF)
- Service gateway in the virtualized Gi and SGi LAN environment

Cisco Services Bus offers the following use cases:

- Internal network controls, such as venue throttling
- Branded services, such as dynamic quality of service (QoS)
- External entity, such as sponsored data
- Rapid delivery of "BAU" (Business As Usual) capabilities, such as zero rating

All the listed use cases require at least one of the following capabilities, all provided by Cisco Services Bus.

- Modification of the default bearer
- Creation or modification of the dedicated bearer
- Reverse charging the usage to a sponsor (zero rate for the user)

Why Cisco?

- Services that are quick and easy to use, helping to accelerate time to revenue and reduce the cost and complexity of new services
- Enhanced services using previously untapped data
- Application and network layer interaction to create improved quality of experience (QoE) and context

The core of the solution architecture consists of real-time network service and subscriber abstraction and orchestration:

- A centralized abstraction and workflow orchestration layer delivering enhanced visibility and programming
- A data distribution function that provides a workflow engine for service routing and response coordination between analytics, PCRF, and services and applications
- An abstraction function that provides a stateless communications plane for service aggregation and protocol conversion
- Primary pieces of the abstraction:
 - Cisco Services Bus (CSB), which provides the service aggregator function and is a centralized point for collection and coordination of real-time network, subscriber, and application intelligence (packet core, probes, Gi nodes, and other Cisco elements) to support new services
 - API gateway, which provides the protocol translation function, securely supporting deeper integration with third parties
 - OSS integration, which provides billing and settlement integration into existing OSS, as well as third-party service brokers to provide orchestration workflows.

For More Information

To learn more about the Cisco Service Bus, visit the [Cisco Services Bus Page](#).



Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
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