Media Routes
Cloud Communications Platform

Service Delivery Engine

SDE OVERVIEW:

Media Routes SDE (Service Delivery Engine) is the central execution engine in Service Delivery Platform that provides the foundation for all Services, Applications and business logic for service orchestration and delivery in next generation telecommunication networks. It is the core environment that runs communications applications and call flows. It is internally composed of multiple components.

SDE provides three key functionalities**:**

1. It is an efficient execution environment that supports a rich set of protocol Connectors. Examples of Connectors include SIP, Media Services, RADIUS, DIAMETER, XML over socket, HTTP, Database Stored Procedures and query interface to name a few.
2. It is a service orchestration platform that enables implementation of business and application logic and call-flows that can be invoked using well-known scripting languages to tie up application components together into realization of complex service delivery scenarios.
3. It is an integration and mediation point for external systems in both CSP and Enterprise environments. It exposes both Northbound and Southbound interfaces for integration and mediation so that external applications can invoke its own service logic and applications implemented in orchestration scripts, and it can call into other third party systems to invoke their services at different points during the execution of its application's service logic.

PROGRAMMABILITY

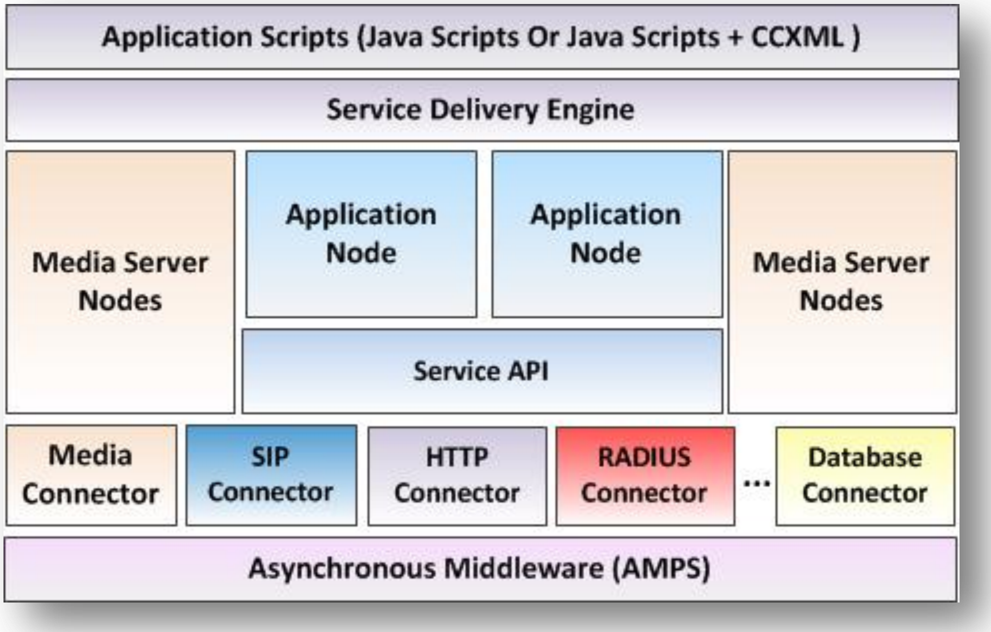
SDE supports on-the-fly programmability via scripting that allows modification and enhancement of business logic by two means:

- The universally well-known JavaScript
- CCXML (a W3c standardized language) in combination with JavaScript

SCALABILITY

SDE scales seamlessly by adding hardware resources since it internal architecture is composed of individually scalable modules on a process level. The internal architecture supports a highly concurrent system that is able to handle thousands of concurrent sessions for very large scale deployments.

ARCHITECTURE:



SDE comprises of the following components:

APPLICATION NODE (AN)

- Application Nodes are software processes that run **communications applications** written in the form of scripts.
- Each AN is an execution environment and a run-time system that maintains the state of communication sessions and provides the necessary infrastructure for applications to render their services.
- Each instance of AN is an Operating System process implementing a Communications application. These include SIP applications such as IP PBX, Mobile PBX, Automatic Call Distributor, Voice Mail and several others.
- An application may be confined to a single instance or it may span across multiple instances of Applications Nodes. More nodes can be created to improve scalability and performance of different parts of applications by adding CPU resources.
- Media Routes provides a variety of full working and tested enterprise applications with an associated data model and database schema.

Applications running on the Application Node are programmed in one of the two scripting languages:

- The universally well-known JavaScript
- CCXML (a W3c standardized language) in combination with JavaScript

SERVICE API

SDE exposes a rich set of API (Application Programming Interfaces) for script-based application developers. These are primitive operations for different tasks that a typical application may require. Examples include:

- Creating and receiving telephony calls over SIP
- Playing and recording media files with the help of Media Server Nodes
- Collecting DTMF digits with the help of Media Server Nodes
- Sending and receiving SMS over SMPP
- Creating Conferences
- Authentication Authorization and Accounting over RADIUS and DIAMETER
- Access database and performing direct Stored Procedure calls
- Accessing Web-services over HTTP using RESTFUL API and other methods such a calling server side scripts.
- Sending and receiving XML packets directly over sockets

PROTOCOL CONNECTORS

SDE consists of several protocol stacks. These stacks are called “Connectors” since they connect the system to external client and server applications on these protocols. Each Connector exposes its own service API to script-based applications in the form of primitive operations described above. Conversely, each service API is owned and provided by one Connector. The list of Connectors is ever-growing as more protocols are added to SDE on a regular basis according to Media Routes roadmap. The currently supported connectors include:

- SIP
- HTTP (with RESTFUL API support)
- RADIUS (as a client)
- DIAMETER (as a client)
- Database access (supports Stored Procedure calling for both MySQL and Oracle)
- XML over socket
- Media Handling (MSCML over SIP)

MEDIA SERVER NODE (MN)

These are software processes that run the server application that handles media. Media Server has a corresponding Connector in the SDE available to Application scripts that exposes its own set of service APIs for media handling. Media Connector communicates with Media server Node using standard SIP protocol with a standardized XML based language called MSCML (Media Server Control Markup Language) embedded in the body of SIP INFO messages. As a result of separate Media serving nodes, Media handling, which is typically more CPU intensive can be scaled and distributed across multiple CPU cores, multiple physical servers, and even geographically distributed servers in isolation from the other parts of SDE such as Applications nodes.

Media handling involves all media related tasks such as:

- Media Relaying and Proxy
- Media Trans-Coding
- Multi-party Conference handling
- Media Recording
- Collection of user entered digits during multi-media sessions as DTMF
- Playing of Pre-stored Media files for use cases such as:
    - Ring-back tones and Dial tones
    - Announcements
    - IVR prompts and menus
- Handling of incoming Fax
- Video Relaying