Mitel MiContact Center Enterprise

OPEN APPLICATION SERVER – RESOURCE ALLOCATION ALGORITHM

Release 9.5 SP3

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TRADEMARKS

Open Application Server Resource Allocation Algorithm
Release 9.5 SP3– April 2022

INTRODUCTION

OAS provides network-wide media resource sharing through the Resource Allocation Algorithm (RAA). This capability makes it possible for applications to share expensive resources over the network.

To provide media services on a call at a virtual device, media resources must first be attached to the call. The Resource Allocation Algorithm locates the most appropriate media resources within the OAS network and reserves the resources for the call at the Media Server.

For each etpAllocateResources() service request from a client application, the Resource Allocation Algorithm uses the following two inputs, as illustrated in Figure 1, to reserve the requested media resources:

- Media Server configuration
- etpAllocateResources() service request

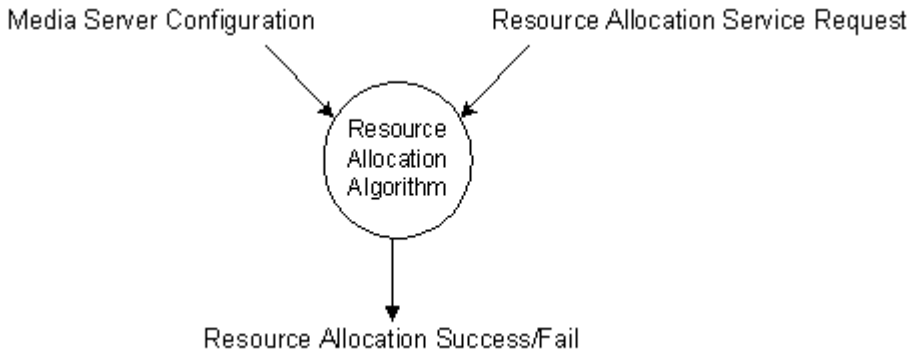

Figure 1: Illustration of Resource Allocation Algorithm

WHAT YOU WILL LEARN

This document describes the following topics:

1. Media Server configuration
2. Call requests
3. How the Resource Allocation Algorithm works
4. Resurce allocation examples

MEDIA SERVER CONFIGURATION

The Media Server configuration is administered using OAS Configuration Manager, which is described in the OAS Software Configuration section. The configuration data pertaining to the Resource Allocation Algorithm consists of three components:

- Media resources contained within the CTI Server
- Media Server characteristics
- Media Server requirements

MEDIA RESOURCES

Media resources exist within the Media Server host. OAS supports the following media resources:

- Automatic Speech Recognition (ASR)
- DTMF Signal Detector
- DTMF Signal Generator
- Player
- Recorder
- Text To Speech (TTS)

RESOURCE CHARACTERISTICS

Resource Characteristics are used to specify the characteristics of the language-dependent resources. The language-dependent resources are: Sound Player, ASR, and TTS.

OAS Configuration data provides Resource Characteristics for language-dependent resources. Note that it is possible to configure Sound Player, ASR, and TTS as many times as the number of languages; however, each resource with one language can be configured only once. This is shown in Figure 2 below.

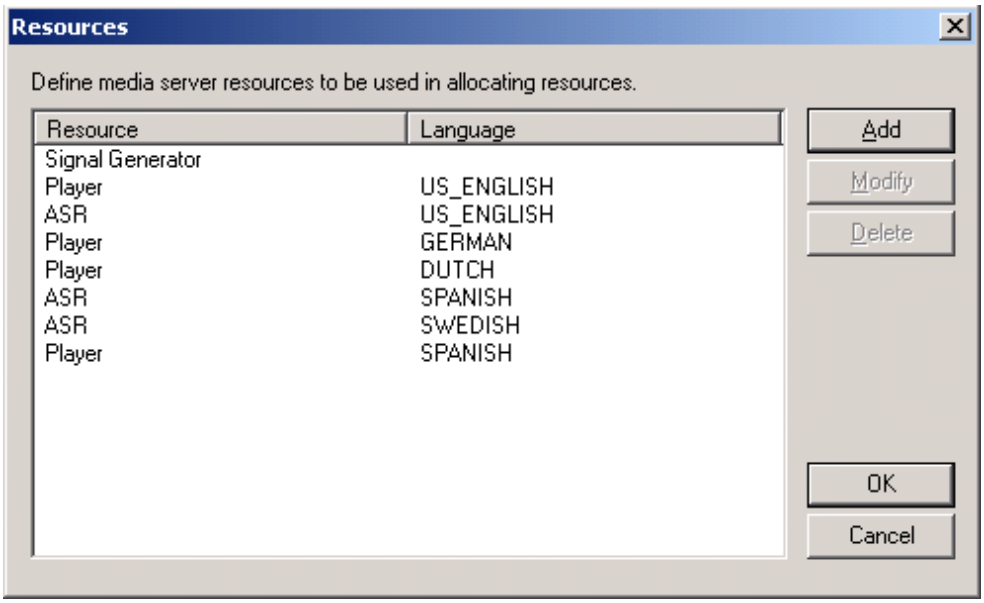

Figure 2: Resource dialogue box

SERVER CHARACTERISTICS

Server Characteristics are used to describe specific characteristic(s) of the Media Server. You can assign Server Characteristic(s) based on specific factors, like performance of the server that runs OAS. A Media Server can be configured to have one or more Server Characteristics. For example:

1. A Media Server running on a server with 3.4 GHz processor speed and 64GB of memory can be configured with Server Characteristic as FAST_SERVER.
2. A server that runs only Media Server and no other component of OAS can be configured with Server Characteristic as MEDIA_SERVER_ONLY.

SERVER REQUIREMENTS

A Media Server can be configured to have Server Requirements, which are used to specify requirements placed on a call.

For example, a Media Server running alone on a server that is intended to be used for calls from a specific group of customers, say VIP Customers, can be configured with Server Requirements as VIP_CUSTOMER.

CALL REQUEST

The resource requirements for a call are specified by the client application using etpAllocateResources() service request. For the purpose of the Resource Allocation Algorithm, there are two categories of resource requirements:

- Media Resource Requirements
- Application-Defined Attributes

MEDIA RESOURCE REQUIREMENTS

The Media Resource Requirements are the specific media resources and the characteristics of each required by the call to accomplish the necessary media processing. For a Media Server to be considered a resource candidate, it must, at a minimum, be configured to have all the media resource requirements.

APPLICATION-DEFINED ATTRIBUTES

The Application-Defined Attributes contain Call Requirements and/or Call Characteristics. Application-Defined Attributes are specified by the client application in the etpAllocateResources() service request.

CALL REQUIREMENTS

If the client application uses Call Requirements, the application MUST indicate whether the Call Requirement is MANDATORY or PREFERRED. RAA verifies that the Call Requirements match the Server Characteristics.

When Call Requirements are used by the client application in the etpAllocateResources() service request, a Media Server is considered a candidate only if its Server Characteristics are configured to match ALL the mandatory Call Requirements. Preferred Call Requirements are used to prioritize each candidate CTI Server.

Following is an example of call requirements:

etpAllocateResources (acsHandle, invokeID, *call , NULL, *resourceList, resourceCharacteristics, “LA_MEDIA_SERVER=MANDATORY”) ;

CALL CHARACTERISTICS

Call Characteristics describe specific characteristics of the call. Using Call Characteristics, the client application can obtain media resources on a Media Server with specific Media Server requirements.

Following is an example of call characteristics:

etpAllocateResources (acsHandle, invokeID, *call , NULL, *resourceList, resourceCharacteristics, “VIP_CUSTOMER”);

The following example shows the syntax to use for both Call Requirements and Call Characteristics in an Allocate Resource service request:

EtpAllocateResources (acsHandle, InvokeID, *call, NULL, *resourceList, resourceCharacteristics, “VIP_CUSTOMER,LA_MEDIA_SERVER=MANDATORY”) ;

For detail information about the syntax, refer to *Open Application Server API Programmer’s Guide*.

HOW THE RESOURCE ALLOCATION ALGORITHM WORKS

The Resource Allocation Algorithm performs three distinct, sequential tasks:

3. Creates a list of candidate Media Servers. For a Media Server to be considered a candidate, ALL the following conditions must be met:

- The Media Server must be configured to have all the required media resources.
- If there are any MANDATORY Call Requirements, they must ALL be matched by the corresponding Media Server Characteristics.
- If there are any Media Server Requirements, AT LEAST ONE must be matched by the corresponding Call Characteristics.

4. Sorts the list of candidate Media Servers. Each candidate Media Server is placed into one of two priority groups. There is no prioritization within each priority group.

- If there are NO preferred Call Requirements, all candidate Media Servers are placed into priority group 1.
- If there are ANY preferred Call Requirements:
- Priority group 1 contains candidate Media Servers having Server Characteristics matching ALL the corresponding preferred Call Requirements.
- Priority group 2 contains candidate Media Servers that do not meet the above criteria (that is, the Server Characteristics do not match all the preferred Call Requirements).

5. Reserves the media resources at a Media Server. The candidate Media Servers are queried in group priority order until one responds by having the media resources reserved. Within each priority group, if the group contains the CTI Server where the call is currently situated, this Media Server is queried first.

RESOURCE ALLOCATION EXAMPLES

This section provides some example call scenarios and the resulting group list of candidate CTI Servers. For the examples, assume the following CTI Server configuration:

CTI SERVER	CANDIDATE [Y/N]	PRIORITY GROUP	REASONS
CTI Server	Media Resources	Server Characteristics (SCs)	Server Requirements (SRs)
LosAngelesOffice	Player (English US) Signal Detector ASR (English US)	IN_LOS_ANGELES	
NewYorkOffice	Player (English US) Player (German) Signal Detector ASR (English US)	IN_NEW_YORK	IVR_APPLICATION
ChicagoOffice	Player (English US) Signal Detector ASR (English US)	IN_CHICAGO FAST_SERVER	VIP_CUSTOMER
MunichOffice	Player (German) Signal Detector ASR (German)	IN_GERMANY	VIP_CUSTOMER ROUTER_APPLICATION
RomeOffice	Player (German) Player (Italian) Signal Detector ASR (Italian)	IN_ITALY	

CALL SCENARIO 1

The Call Request specified for this call:

- Media Requirements: player (English US), signalDetector
- Call Requirements: **FAST_SERVER=MANDATORY**
- Call Characteristics: **VIP_CUSTOMER**

CTI SERVER	CANDIDATE [Y/N]	PRIORITY GROUP	REASONS
LosAngelesOffice	N	N/A	Media Server has all required media. CR FAST_SERVER=MAND ATORY not matched by any SC.
NewYorkOffice	N	N/A	Media Server has all required media. CR FAST_SERVER=MANDATORY not matched by any SC.

CTI SERVER	CANDIDATE [Y/N]	PRIORITY GROUP	REASONS
ChicagoOffice	Y	1	Media Server has all required media. CR FAST_SERVER=MANDATORY matched by SC. SR VIP_CUSTOMER matched by CC. No PREFERRED CRs.
MunichOffice	N	N/A	Media Server does not have all required media.
RomeOffice	N	N/A	Media Server does not have all required media.

CALL SCENARIO 2

The Call Request specified for this call:

- Media Requirements: player (German), signalDetector
- Call Requirements: **IN_GERMANY=PREFERRED**
- Call Characteristics: **ROUTER_APPLICATION**

CTI SERVER	CANDIDATE [Y/N]	PRIORITY GROUP	REASONS
LosAngelesOffice	N	N/A	Media Server does not have all required media.
NewYorkOffice	N	N/A	Media Server has all required media. No MANDATORY CRs. SR IVR_APPLICATION not matched by any CC.
ChicagoOffice	N	N/A	Media Server does not have all required media.
MunichOffice	Y	1	Media Server has all required media. No MANDATORY CRs. SR ROUTER_APPLICATION matched by a CC. CR IN_GERMANY=PREFE RRED matched by an SC.
RomeOffice	Y	2	Media Server has all required media. No MANDATORY CRs. CR IN_GERMANY=PREFE RRED not matched by any SC. No SRs.