Cisco MSE API Specification Guide – Context Aware Service of MSE, Release 7.4

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Preface

This preface describes the audience, organization, and conventions of the *Cisco MSE API Specification – Context Aware Service Guide, Release 7.4*. It also provides information on how to obtain related documentation.

This chapter includes the following sections:

- Audience

- Organization

- Document Conventions

- Related Documentation

- Obtaining Documentation and Submitting a Service Request

Audience

This publication is for experienced users who configure and maintain MSE Devices such as application developers, system integrators, or customers looking to develop solutions using this technology.

Organization

This reference is organized as follows:

Chapter and Title	Description
Chapter 1 Overview	Describes the Cisco MSE API Specification
Chapter 2 Common Object Model	Describes the Common Object Model

Chapter 3 Common Login/Logout	Describes the Common Login/Logout API
Chapter 4 Generic APIs	Describes the Generic APIs
Chapter 5 Design	Describes the Design based API
Chapter 6 Location – Common Definitions	Describes the Location – Common Definition API
Chapter 7 Location – STATION	Describes the Location – Station API
Chapter 8 Location – Tag	Describes the Location – Tag API
Chapter 9 Location – Rogues	Describes the Location – Rogue API
Chapter 10 Location Presence	Describes the Location – Presence API
Chapter 11 Wired Module	Describes the Wired Module API
Chapter 12 Asynchronous Notifications	Describes the Asynchronous Notifications
Chapter 13 Examples	Describes the Examples in Java, and C#

Document Conventions

This document uses the following conventions:

Note: *Means reader take note. Notes contain helpful suggestions or references to material not covered in the manual*.

Caution: *Means reader has to be careful. In this situation, you might do something that could result in equipment damage or loss of data*.

Tip: Means the *following information will help you solve a problem*.

Related Documentation

Follow these steps to obtain documentation updates and related documentation for the context-aware API:

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1. Open your web browser and browse to the Cisco Developer Community Context-Aware API web page on Cisco.com at this URL:
   http://developer.cisco.com/web/contextaware/home

2. Double-click Resources.

3. Click the desired link to open or download the desired component.

How to Obtain Support

Cisco provides two distinct categories of support that developers can use within the Cisco Developer Community:

- **Self-help**—The Cisco Developer Community web portal enables a developer to search available documentation, API information, and other community areas within the web portal. A Developer Community Forum is available for you to read other developer questions and for you to post simple techical API questions (see the "Cisco Developer Community").

- **Developer ServiceProgram**—This is an annual fee-based subscription service that provides a more dedicated form of support with guaranteed response times and issue resolution (see the "Developer Services Program").

You can choose the support method that best fits your needs.

Cisco Developer Community

The CiscoDeveloper Community provides a web portal that provides a vast amount of information and support for the developer, such as overview and getting started information, API documentation, software examples, software development kits, and community forums. The Cisco Developer Community web portal is located at this Cisco.com URL:

http://developer.cisco.com/web/cdc/home

Accessing the Cisco Developer Community Forum

You can view the questions posted by other developers in the Cisco Developer Community forum or you can post your own questions. Please note, only basic questions will be answered.

Follow these steps to access the Cisco Developer Community forum:

1. Browse to the Cisco Developer Community at this URL:http://developer.cisco.com/web/cdc/home

2. Click the Community tab.

3. Scroll down and click Context-Aware Mobility (Location).

4. Click one of these Forum Category selections:

    a. Location Appliance API Questions

    b. WSDL Queries

    c. Other/Miscellaneous

    You can view all the posted entries in the chosen category.

5. To post a question in the chosen category, click Post New Thread.

6. You must login by using your Cisco.com username and password or register by clicking Register Now.

7. Read the agreement and click I Accept.

8. Enter the requested information to setup your account.

9. When your account information is accepted, you can post your questions to the forum.

Developer Services Program

You must join the Developer Services Program and obtain a support contract before you can open a case to resolve your API problems.

How to Join the Developer Services Program

Follow these steps to join the Developer Services Program:

1. Browse to the Cisco Developer Community at this URL:
    http://developer.cisco.com/web/cdc/home

2. Click the Support tab.

3. Click Developer Services Program and read the program details.

4. Click Getting Started, and follow the steps outlined in the To order your subscription section

    Note: *For any Developer Services Program related questions, you can send an email to developer-support@cisco.com.*

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How to Open a Developer Services Case

To open a case for an issue, follow these steps:

Note: *You must join the Developer Services Program and have a support contract to open a case.*

1. Browse to the Cisco Developer Community at this URL:http://developer.cisco.com/web/cdc/home

2. Click the Support tab.

3. Click Developer Services Program.

4. Click Open a Support Case and follow the indicated instructions.

1 Overview

1.1 Introduction

This document defines all the APIs available in the Mobility Services Engine.

1.2 Purpose

The goal of this document is to describe the interface to the Cisco Mobility Services Engine and how client systems may take advantage of the system.

1.3 System High Level

What is MSE?

- MSE (Mobility Services Engine) is the insertion point for services in the network.
- Ability to add services outside elements in the data path (controller/switch) facilitating faster adoption.
  - MSE is the integration point for applications through well defined APIs that help in Asset tracking for location.
- MSE becomes the platform for integration between Cisco technologies and partners.

The MSE communicates with the WLAN infrastructure components such as the Wireless LAN Controller (WLC), The Wireless Control System (WCS) and the Location Server. The MSE gathers statistics and data of the clients from these components – information such as location.

In a very small network all services could be running on the same box. So based on the scaling requirements and deployment scenarios a Mobility Service Engine box can contain one to many services. Services running inside one box can interact with services running on another box.

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Any application like WCS or other partner application or devices which wants to use the one or more services provided by MSE can communicate to MSE through unified APIs over various protocols supported by MSE - HTTP/SOAP.
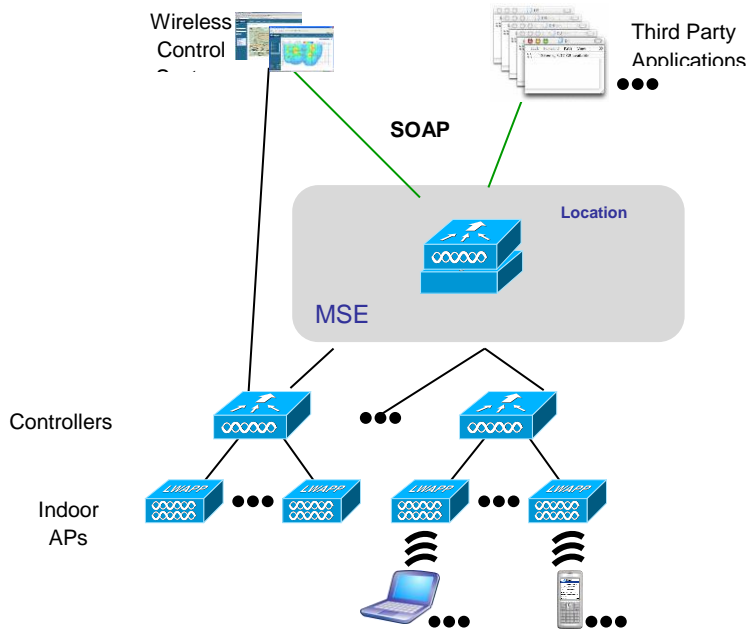
Figure 1 Mobility Service Engine – System Level

1.4 Salient API features

MSE exposes the following HTTP/SOAP endpoints:

Note: *The service engine specific endpoints are present if the service exists on a MSE box. It is licensed and enabled*.

Table 1

Endpoint URL	Target Service/Module
https://mseipaddress/aaa/	*Login and Logout Module*
https://mseipaddress/location/	*Design and Location Module*

From MSE, there will be two WSDL, common Login/Logout to the engine and location as a seperate service.

- *mse-aaa.wsdl* - which contains calls for Login/Logout with endpoint https://mseip/aaa/

- *mse-location.wsdl* - which contains all location calls with endpoint https://mseip/location/

- *Note the trailing slash in the URI*

- HTTP will be disabled by default.
- The default port of 80 will be used for HTTP and 443 for HTTPS.

- Name spaces for Login/Logout, admin API is http://cisco.com/mse/types, http://cisco.com/mse/admin.
- Name spaces for location API is http://cisco.com/mse/location .
- For backward compatibility, location requests are accepted at port 8001 also.
- In future releases port 8001 will be deprecated, All API requests should go through the MSE.
- ***In case API port was configured to anything other than 8001 on legacy systems, it will be changed to 8001 upon upgrade to 7.1 and later releases and this port is no longer configurable.***

CHAPTER 2

2 Common Object Model

2.1 Baseclass

All objects in the MSE system inherit from the **AesObject** class. The **AesObject** class defines an object identifier that uniquely identifies the object in the MSE database. If this object identifier is not assigned, then the object is a new object not yet managed or assigned by the MSE.

All persistent objects returned from the MSE have the following common attributes returned as part of their XML content.

- objectId - Unique object identifier for the class

- parentId - Unique object identifier for the parent

- changedOn -Timestamp of the last change (addition or modification) to the entry

- options - Defines whether this object represents:

  - OPT_FULL - A full object defines all attributes including all children objects and attachments.

  - OPT_MED - A medium object defines all attributes including all children **without** any attachments.

  - OPT_MIN - A minimum object defines the attributes of the object only **without** any children or attachments.

2.2 Business Session

Most requests to the server must contain an **AesBusinessSession** object that identifies the authenticated client's session. A session is granted as part of the login process and contains a unique id that identifies the IP Address and user to the server.

Class	AesBusinessSession		
	Attribute	**Type**	**Access**
	id	Integer	RO

2.3 AesResult

Many methods return a result indicating success or failure of the operation. In certain circumstances there are additional arguments passed back to the caller of the method. The result has the ability to return a composite object for custom results. The class used to return this is **AesResult**.

Class	AesResult		
	Attribute	**Type**	**Access**
	objectId	Long	RO
	changedOn	Long	RO
	parentId	Long	RO
	options	int (enum) OPT_FULL = 0 OPT_MED = 1 OPT_MIN = 2	RO
	result	Boolean	RO

	message (not null only if result is false)	string	RO

2.4 AesUIdObject

AesSwitch, AesFloor, AesBuilding, AesNetworkDesign, AesTrackGroup, WiredSwitch objects in the MSE system inherit from the **AesUIdObject** class. The AesUIdObject class defines unique id used by both WCS and MSE/CAS for synchronized objects.

Class	AesUIdObject		
	Attribute	**Type**	**Access**
	aesUId	Long	RO
	objectVersion	int	RO
	appType	Int(enum) UNKNOWN(0) WCS(1) THIRD_PARTY(2)	RO

2.5 AesQueryCriteria

Many query methods allow the caller to specify an arbitrary query criteria. The API provides a flexible language to query objects using the AesQueryCriteria class. This object allows logical combinations of attribute matching using AND/OR and combinations of them.

An **AesQueryCriteria** object defines the following ability:

- Sorting – Sort the results based on a list of ascending attributes. For example, Name -> IP Address -> Mac Address

- Paging - Specify the starting index and the number of entries to return as part of this query. For example, the sequence returns a total of 60 results in 3 pages.

    - Start 0 Number Of Results 20

    - Start 21 Number Of Results 20

    - Start 41 Number of Results 20

- Attribute matching - Perform equivalence, greater-than, less-than tests on defined attributes on a particular object, perform case sensitive or insensitive matching on defined string attributes, combine multiple expressions to form a larger expression. For example, name EQ "fred" AND changedOn GT "now".

- Options - Defines whether the result set should include objects that are:
    - OPT_FULL - A full object defines all attributes including all children objects and attachments.

    - OPT_MED - A medium object defines all attributes including all children without any attachments.

    - OPT_MIN - A minimum object defines the attributes of the object only without any children or attachments.

Join queries - Perform matching that combines table queries on the server. For example, give all client information (from the mobile station info table) that is on floor-id 1 (from the mobile station location table).The query structure is as follows:

Class	AesQueryCriteria		
	Attribute	**Type**	**Access**
	sortCriteria (will be deprecated)	AesSortCriteria	RW
	sortColumnCriteriaList	SortColumnCriteria	RW
	containList	A list of ContainEl	RW
	andList	A list of AesCriteria	RW
	orList	A list of AesCriteria	RW
	startIndex	int	RW
	numOfResults (mandatory field)	int	RW
	options	int (enum) OPT_FULL = 0 OPT_MED = 1	RW

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		OPT_MIN = 2	
Class	AesSortCriteria (will be deprecated)		
	Attribute	**Type**	**Access**
	sortColumns	A list of Strings	RW
Class	SortColumnCriteria		
	Atribute	Type	Access
	sortColumn	String	RW
	isDescending	Boolean	RW
Class	ContainEL		
	hierEl	hierEl	RW
	containCl	String	RW
	size	int	RW
Class	hierEl		
	Attribute	**Type**	**Access**
	val	String	RW
Class	AesMatchMbrCriteria		
	Attribute	**Type**	**Access**
	operator	int (enum) Options: OP_EQ =0;　　OP_LT = 1 ; OP_GT= 2 ;　　OP_GTEQ= 3; OP_LT_EQ= 4; OP_LIKE = 5; OP_NOT_LIKE =6; OP_NOT_EQ = 7	RW
	caseInsensitive	boolean	RW
	matchClass	String	RW
	matchMbr	String	RW

	matchValue	Object	RW
	valueClass	String	RW
Class	AesTelemetryCriteria		
	Attribute	**Type**	**Access**
	operator	enum Options: EQUALS("="), NOT_EQUAL("!="), LESS_THAN("<"), GREATER_THAN(">"), GREATER_OR_EQUAL(">="), LESS_OR_EQUAL("<="), LIKE("like"), NOT_LIKE("not like");	RW
	telemField	enum Options: GPS_LAT, GPS_LONG, GPS_ALT, GPS_ALT_TYPE, GPS_DATUM, TEMPERATURE, MOTION, DISTANCE, FUEL, QUANTITY, PRESSURE, HUMIDITY, STATUS, EPC_HDR, EPC_MANUF, EPC_SKU, EPC_SERIAL_NO, MOTION_PROB;	RW
	telemValue	Object	RW
	valueClass	String	RW
	caseInsensitive	boolean	RW
Class	AesMatchColumnCriteria		
	tableName1	String	RW
	fieldName1	String	RW

	tableName2	String	RW
	fieldName2	String	RW

The **telemValue** object will depend on the telemetry type being queried for and should be populated by the user as follows:

TelemField	telemValue object Type	Valid operators
TelemField.GPS_LAT	Double	=, !=, <, >, <=, >=
TelemField.GPS_LONG	Double	=, !=, <, >, <=, >=
TelemField.GPS_ALT	Double	=, !=, <, >, <=, >=
TelemField.GPS_ALT_TYPE	Integer	=, !=, <, >, <=, >=
TelemField.GPS_DATUM	Integer	=, !=, <, >, <=, >=
TelemField.TEMPERATURE	Float	=, !=, <, >, <=, >=
TelemField.MOTION	Float	=, !=, <, >, <=, >=
TelemField.DISTANCE	Float	=, !=, <, >, <=, >=
TelemField.FUEL	Float	=, !=, <, >, <=, >=
TelemField.QUANTITY	Long	=, !=, <, >, <=, >=
TelemField.PRESSURE	Float	=, !=, <, >, <=, >=
TelemField.HUMIDITY	Integer	=, !=, <, >, <=, >=
TelemField.STATUS	String (valid = unicode string)	=, like, not like
TelemField.EPC_HDR	byte[]	=, !=
TelemField.EPC_MANUF	byte[]	=, !=
TelemField.EPC_SKU	byte[]	=, !=
TelemField.EPC_SERIAL_NO	byte[]	=, !=
TelemField.MOTION_PROB	byte[]	=, !=

CHAPTER 3

3 **Common Login/Logout**

The MSE API provides many methods for use by an external application or system. Prior to use of those methods all systems must login to the MSE. This process is achieved by the external system calling the method **Login** passing credentials that are authenticated by the MSE. The call for login bypasses auth verification and is directly handled by the login component. The login method call will have username and password which is validated by the login module against the users stored in the database. If the login is successful then a business session ID is assigned to identify this session and it's returned back as a response to the user. All subsequent calls for all other methods should include this Business ID in every request.

Note: *Login/Logout requests are processed at* ***https://mse/aaa/*** *endpoint where mse represents the IP address of the MSE engine.*

3.1 METHOD: Login

Allows a Client application to login to the MSE. Users are authenticated against the server database and a business session is established for authenticated users. This session identifies the user's privileges and access to the system.

Class	AesLogin		
	Attribute	**Type**	**Access**
	userName	String	RO
	password	String	RO

Result: Returns an AesBusinessSession object containing the session identifier.

Class	AesBusinessSession

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	Attribute	Type	Access
	id	Integer	RO

3.1.1 **SOAP Request**

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
    <soap:Body>
        <Login xmlns="http://cisco.com/mse/types">
            <AesLogin userName="admin" password="admin" />
        </Login>
    </soap:Body>
</soap:Envelope>
```

3.1.2 **SOAP Response**

3.1.2.1 **Success**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Session xmlns="http://cisco.com/mse/types">
            <AesBusinessSession id="25060"/>
        </Session>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

3.1.2.2 **Failure**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns="http://cisco.com/mse/types">
            <AesResult message="No server response for: Login" result="false"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

3.2 METHOD: Logout

Disconnects a client from the server and free up the business session and associated resources.

Result: AesResult.

Arguments: AesBusinessSession, AesQueryCriteria

3.2.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Logout xmlns="http://cisco.com/mse/types">
            <AesBusinessSession id="10331" mask="255"/>
            <AesLogout/>
        </Logout>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

3.2.2 **SOAP Response**

3.2.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns="http://cisco.com/mse/types">
            <AesResult result="true"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

3.2.2.2 Failure

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns="http://cisco.com/mse/types">
            <AesResult message="Failed to authenticate session: 10331"
result="false"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

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CHAPTER 4

4 Generic APIs

Following API requests are processed at **https://mse/location/** endpoint where mse represents the IP address of the MSE engine.

4.1 METHOD: Ping

Allows an authenticated client to ping the server functionality. Not just an IP ping, but will also verify connection to the database and processes within the server are operating correctly.

Result: AesResult returning success or failure of the ping.

Arguments: AesBusinessSession identifying the client authenticated and the functional area of the server to ping.

Class	AesPing		
	Attribute	**Type**	**Access**
	area	String	RO

4.1.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Ping xmlns="http://cisco.com/mse/location">
            <AesBusinessSession id="7406"/>
            <AesPing area="database"/>
        </Ping>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

4.1.2 **SOAP Response**

4.1.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns="http://cisco.com/mse/location">
            <AesResult result="true"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

4.2 METHOD: GetServerInfo

Gets the information describing various parameters for the server.

Result: An AesServerInfo object

Arguments: AesBusinessSession

Class	AesServerInfo		
	Attribute	**Type**	**Access**
	version	String	RO
	productName	String	RO
	startTime	long	RO
	restarts	long	RO
	timeZone	String	RO
	timeOffset	int	RO
	logLevel	int (enums) - OFF, ERROR, INFO, TRACE, ALL	RW
	logModules	int (enums) LOG_OBJ_MGR = 0x0004	RW

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		LOG_FAULTS = 0x0020 LOG_SNMP_MED = 0x0040 LOG_GENERAL = 0x0080; LOG_CORE_ENGINE = 0x0100; LOG_LOCATION = 0x0200; LOG_DB = 0x0400, LOG_XML_MED = 0x0800 LOG_ASYNC = 0x1000	
	usedMemory	long	RO
	allocatedMemory	long	RO
	maxMemory	long	RO
	currActiveSessions	long	RO
	daysToKeepEvents	int	RW
	portNumber	int	RW
	useHTTPS	boolean	RW
	advancedDebug	Boolean	RW
	currentTime	long	RO
	dbBackupInDays	int	RW
	dbVirtualMemory	long	RO
	dbVirtualMemoryLimit	long	RO
	dbDiskMemory	long	RO

	dbFreeSize	long	RO
	sessionTimeoutInMins	int	RW
	License	AesLicense	RW
	hwInfo	AesHwServerInfo	RO
	currActiveElements	int	RO
	activeElementsLimit	int	RO
	activeSessions	List of AesBusinessSession	RO
	activeClientCount	int	RO
	activeTagCount	int	RO
	activeRogueCount	int	RO
	stationsNotTracked	int	RO
	tagsNotTracked	int	RO
	roguesNotTracked	int	RO
	totalNotTracked	int	RO
	activeWiredClientsCount	int	RO
	wiredClientsNotTracked	int	RO
	wiredClientsLimit	int	RO
	tagsLimit	int	RO
	mseServiceInfoList	List of MseServiceInfo	RO

Class	AesHwServerInfo		
	Attribute	**Type**	**Access**
	hwVersion	String	RO

	hwProductIdentifier	String	RO
	hwSerialNumber	long	RO

Class	MseServiceInfo		
	Attribute	**Type**	**Access**
	serviceName	String	RO
	serviceVersion	String	RO
	serviceType	Int Location(0) WIPS(1) SMC(2)	RO
	adminStatus	Int Diable(0) Enable(1)	RO
	operationStatus	Int Down(0) Up(1)	RO

4.2.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetServerInfo xmlns="http://cisco.com/mse/location">
            <AesBusinessSession id="21762" mask="255"/>
        </GetServerInfo>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

4.2.2 **SOAP Response**

4.2.2.1 Success

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">
   <soapenv:Body>
      <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
```

```
        <AesServerInfo activeElementsLimit="2500" allocatedMemory="130220032"
currActiveSessions="1" currentTime="1208925159293" daysToKeepEvents="2"
dbDiskMemory="8224768" dbFreeSize="5448" dbVirtualMemory="619"
dbVirtualMemoryLimit="256000000" keepAbsentDataInMins="1440" logLevel="TRACE"
logModules="19968" maxMemory="518979584" portNumber="8001" productName="Cisco Wireless
Location Appliance" restarts="3" sessionTimeoutInMins="30" startTime="1208756088116"
timeOffset="-28800000" timeZone="America/Los_Angeles" useHTTP="false"
usedMemory="31076840" version="5.2.8.0">
          <activeSessions>
            <AesBusinessSession clientIPAddress="1.2.3.105" groupId="1" id="21636"
lastAccessTime="1208925159284" mask="-1" startTime="1208906726209" userId="1"/>
          </activeSessions>
          <hwInfo>
            <AesHwServerInfo/>
          </hwInfo>
          <mseServiceInfoList>
            <MseServiceInfo adminStatus="0" operationStatus="0" serviceName="Location
Service" serviceType="0" serviceVersion="5.2.8.0"/>
            <MseServiceInfo adminStatus="0" operationStatus="0" serviceName="WIPS
Service" serviceType="0" serviceVersion="1.0.251.0"/>
          </mseServiceInfoList>
        </AesServerInfo>
      </Response>
  </soapenv:Body>
</soapenv:Envelope>
```

4.3 METHOD: GetFilteringParams

Gets filtering parameters from MSE.

Result: An AesFilteringParams object

Class	AesFilteringParams		
	Attribute	**Type**	**Access**
	disableProbingClientTracking	boolean	RW
	macFilter	boolean	RW
	allowedMacs	String Comma separated string of MAC addresses	RW
	disallowedMacs	String Comma separated string of MAC addresses	RW

	blockedList	String Comma separated string of MAC addresses	RO
	dutyCycleCutoff	Int Range 0 – 100	RW

Arguments: AesBusinessSession

4.3.1 **SOAP Request**

```
<soapenv:Envelope xmlns:soapenv= "http://schemas.xmlsoap.org/soap/envelope/"
xmlns:loc="http://cisco.com/mse/location" xmlns:typ="http://cisco.com/mse/types">
   <soapenv:Header/>
   <soapenv:Body>
     <loc:GetFilteringParams>
        <typ:AesBusinessSession options="0" id="12026"/>
     </loc:GetFilteringParams>
   </soapenv:Body>
</soapenv:Envelope>
```

4.3.2 **SOAP Response**

4.3.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
   <SOAP-ENV:Body>
     <Response xmlns="http://cisco.com/mse/location">
        <AesFilteringParams blockedList="00:40:96:b6:03:6b,00:01:02:03:01:f0,"
changedOn="1343853193169" disallowProbingClientTracking="true"
disallowedMacs="00:0c:cc:5c:05:16," macFilter="true" objectId="1"/>
     </Response>
   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

4.4 METHOD: SetFilteringParams

Sets filtering parameters on the MSE.

Result: An AesResult object specifies the success or failure of the operation

Arguments: AesBusinessSession, AesFilteringParams object containing the information

4.4.1 **SOAP Request**

```
<soapenv:Envelope                xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:loc="http://cisco.com/mse/location" xmlns:typ="http://cisco.com/mse/types">
         <soapenv:Header/>
         <soapenv:Body>
            <loc:SetFilteringParams>
```

```
              <typ:AesBusinessSession options="0" id="29827"/>
              <loc:AesFilteringParams  options="0"  disallowProbingClientTracking="true"
macFilter="true" allowedMacs="11:22:33:44:55:66" disallowedMacs=""/>
           </loc:SetFilteringParams>
        </soapenv:Body>
</soapenv:Envelope>
```

4.4.2 **SOAP Response**

4.4.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
           <Response xmlns="http://cisco.com/mse/location">
              <AesResult result="true"/>
           </Response>
        </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

4.5 METHOD: AllowDisallowEndpoints

It will allow users to provide set of MAC addresses to be tracked or not. It appends to existing list of endpoints being tracked or not tracked.

Result: An AesResult object specifies the success or failure of the operation.

Arguments: AesBusinessSession, list of endpoints(MAC addresses) to be tracked, list of endpoints (MAC address) to not track

4.5.1 **SOAP Request**

```
<soapenv:Envelope        xmlns:soapenv=        "http://schemas.xmlsoap.org/soap/envelope/"
xmlns:loc="http://cisco.com/mse/location" xmlns:typ="http://cisco.com/mse/types">
        <soapenv:Header/>
        <soapenv:Body>
           <loc:AllowDisallowEndpoints>
              <typ:AesBusinessSession options="0" id="29827"/>
              <loc:Allow>
                 <!--0 to 100 repetitions:-->
                 <loc:Endpoint>11:22:33:44:55:67</loc:Endpoint>
              </loc:Allow>
              <loc:Disallow>
                 <!--0 to 100 repetitions:-->
                 <loc:Endpoint>11:22:33:44:55:68</loc:Endpoint>
              </loc:Disallow>
           </loc:AllowDisallowEndpoints>
        </soapenv:Body>
</soapenv:Envelope>
```

4.5.2 **SOAP Response**

4.5.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
            <Response xmlns="http://cisco.com/mse/location">
                <AesResult result="true"/>
            </Response>
        </SOAP-ENV:Body>
    </SOAP-ENV:Envelope>
```

CHAPTER 5

5 Design

This section describes the methods related to getting network design information from the MSE. The network design object hierarchy is the fundamental building blocks of the network location system. The following summarizes some of the more important elements that should be defined:

- Network Design—The container for all networks described in the system

- Group—A folder or organizational object that contains other groups or buildings directly.

- Building—A collection of floors

- Floor—A container of the coverage areas and Access Points in the network

- Coverage Area—A logical area within a floor

- Switch—the switch controller that is managed by the MSE.

- Access Point (AP)—the RF detection device in the network.

- Access Point Interface—the antenna that is part of the AP.

- Marker—logical element positioned in the floor plan.

- Calibration Model—represents the RF model used for floors or areas.

- Antenna Pattern—defines the spectrum associated with a radio antenna.

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- ChokePoint—Chokepoint can be deployed at strategic points in the buildings or campuses. Whenever a RFID Tag moves to within a defined proximity of it the RFID Tag begins transmitting packets advertising its location in relation to the Chokepoint.

Note: *Design related requests should go to* ***https://mse/location/*** *endpoint.*

5.1 Design Model Reference

The following table describes the model and attributes for the design, related classes and their sub-elements.

Class	AesNetworkDesign		
	Attribute	**Type**	**Access**
	name	String	RO
	creator	String	RO
	createdOn	Date	RO
	message	String	RO
	lastUpdated	Date	RO
	groupList	Collection of AesGroup	RO
	civicAddress	AesCivicAddress	RO
	aesUId	Int	RO
	viewImage	AesViewImage	RO
Class	AesGroup		
	Attribute	**Type**	**Access**
	name	String	RO
	isSubGroup	boolean	RO
	buildingList	Collection of AesBuilding	RO
	groupList	Collection of AesGroup	RO
	viewImage	AesViewImage	RO

Class	AesBuilding		
	Attribute	**Type**	**Access**
	name	String	RO
	floorList	Collection of AesFloor	RO
	civicAddress	AesCivicAddress	RO
	aesUId	Int	RO
	viewImage	AesViewImage	RO
Class	AesFloor		
	Attribute	**Type**	**Access**
	name	String	RO
	calibrationModel	AesRef	RO
	offsetX	float	RO
	offsetY	float	RO
	isOutdoor	boolean	RO
	Altitude	float	RO
	latdegs	float	RO
	latmins	float	RO
	latsecs	float	RO
	longdegs	float	RO
	longmins	float	RO
	longsecs	float	RO
	obstacleList	Collection of AesObstacle	RO
	markerList	Collection of AesMarker	RO

	coverageAreaList	Collection of AesCoverageArea	RO
	apList	Collection of AesAP	RO
	chokepointList	Collection of AesChokePoint	RO
	gpsMarkerList	Collection of AesGPSMarker	RO
	civicAddress	AesCivicAddress	RO
	aesUId	Int	RO
	viewImage	AesViewImage	RO
	locationSensorList	Collection of LocationSensor	RO
	regionList	Collection of AesRegion	RO
	railList	Collection of AesRail	RO
	refTagCalibration	AesRefTagCalibration	RO
	refTagLocationList	AesRefTagLocation	RO
Class	AesGPSMarker		
	Attribute	**Type**	**Access**
	latitude	double	RO
	longitude	double	RO
	altitude	int	RO
	altitudeType	Int AT_UNKNOWN = 0; AT_METERS = 1; AT_FLOORS = 2;	RO
	datum	Int	RO
	x	float	RO

	Y	float	RO
	parent	Int Enum : CAMPUS(1), BUILDING(2), FLOOR(3), WIREDSWITCH(4), WIREDSWITCH_PORT(5)	RO
Class	AesCoverageArea		
	Attribute	**Type**	**Access**
	name	String	RO
	pointsSize	int	RO
	type	Int coverage area=0, perimeter=1	RO
	points	Collection of Points	RO
Class	AesObstacle		
	Attribute	**Type**	**Access**
	type	Int TYPE_THICK_WALL = 1; TYPE_NORMAL_WALL= 2; TYPE_THICK_DOOR = 3; TYPE_NORMAL_DOOR=4; TYPE_CUBICLE = 5; TYPE_GLASS = 6;	RO
	attenuation	float	RO
	pointsSize	int	RO

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	points	Collection of Points	RO
Class	AesMarker		
	Attribute	**Type**	**Access**
	label	String	RO
	x	float	RO
	y	float	RO
Class	AesAP		
	Attribute	**Type**	**Access**
	macAddress	String	RO
	ipAddress	String	RO
	numOfSlots	int	RO
	name	String	RO
	angle	float	RO
	switchName	String	RO
	apInterfaceList	Collection of AesAPInterface	RO
	x	float	RO
	y	float	RO
	z	float	RO
	apMode	Int enum LOCAL(0), MONITOR(1), REAP(2), ROGUE_DETECTOR(3), SNIFFER(4),BRIDGE(5), UNKNOWN(6)	RO
	apType	Int Enum: AP_TYPE_5212 = 1; AP_TYPE_5312 = 2 AP_TYPE_MIMO = 3	RO

| | | AP_TYPE_UNKNOWN = 4 AP_TYPE_1100 = 5 AP_TYPE_1130 = 6; AP_TYPE_1240 = 7; AP_TYPE_1200 = 8; AP_TYPE_1310 = 9; AP_TYPE_1500 = 10; | |

Class	AesRail		
	Attribute	**Type**	**Access**
	pointsSize	int	RO
	snapToRailRegion	float	RO
	Point	List of Point	RO
	exclusionPoints	float	RO
Class	AesRegion		
	Attribute	**Type**	**Access**
	pointsSize	int	RO
	regionType	int INSIDE(1), OUTSIDE(2);	RO
	type	String	RO
	points	float	RO
	point	List of Point	RO

Class	SensorProperty		
	Attribute	**Type**	**Access**
	propertyName	String	RO
	propertyValue	String	RO

Class	LocationSensor		
	Attribute	**Type**	**Access**
	macAddress	String	RO
	name	String	RO
	type	String TDOA_RECEIVER("TDOA RECEIVER");	RO
	x	float	RO
	y	float	RO
	z	float	RO
	SensorProperty	List of SensorProperty	RO

Class	AesChokePoint		
	Attribute	**Type**	**Access**
	macAddress	String	RW
	name	String	RW
	range	double	RW
	x	float	RW
	y	float	RW
	z	float	RW
	AesChokepointProperty	List of AesChokepointProperty	RW
	isPerimeter	boolean	RW
Class	AesChokepointProperty		
	name	String	RO
	value	String	RO

Class	AesAPInterface		
	Attribute	**Type**	**Access**
	ifSlotId	int	RO
	~~ifSlotType~~	~~int~~	~~RO~~
	band	Band (enum) UNKNOWN IEEE_802_11_A IEEE_802_11_B	RO
	channelAssignment	Int	RO
	channelNumber	int	RO
	txPowerControl	int	RO
	txPowerLevel	int	RO
	antennaType	int IF_TYPE_802_11A = 0; IF_TYPE_802_11B = 1;	RO Default Value =0
	antennaMode	int ANTENNA_MODE_SECTOR_A = 0; ANTENNA_MODE_SECTOR_B = 1; ANTENNA_MODE_OMNI = 2;	RO
	antennaDiversity	int	RO
	antennaPattern	String	RO
	antennaAngle	float	RO
	antennaElevAngle	float	RO

Class			
	List of AesAntenna	optAntennaList	RO
	antennaGain	int	RO

Class	AesRefTagLocation		
	Attribute	**Type**	**Access**
	macAddress	String	RO
	locationX	float	RO
	locationY	float	RO
	status	int	RO

Class	AesRefTagCalibration		
	Attribute	**Type**	**Access**
	status	int STATUS_DISABLED = 0; STATUS_ENABLED = 1;	RO
	startTime	long	RO
	recurrenceInterval	int	RO
	recurrenceMode	int RECURRENCE_MODE_DAYS = 0; RECURRENCE_MODE_WEEKS = 1; RECURRENCE_MODE_MONTHS = 2;	RO
	nextStartTime	long	RO

5.2 METHOD: GetNetworkDesignList

Queries the list of network designs contained in the server. The query can be:

- NULL - Return all network designs and their contents.

- Count Query - Return the number of network designs in the server

- All other queries (sorting, paging, member match and so on) - The list of network designs and their content, constrained based on the query content.

Result: See below.

Arguments: AesBusinessSession, AesQueryCriteria

5.2.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetNetworkDesignList xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="13614" mask="255"/>
        </GetNetworkDesignList>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

5.2.2 **SOAP Response**

5.2.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesNetworkDesign    changedOn="1106866603484"    createdOn="1106866603484"
creator="allan thomson" mask="3" message="This is a test of the network design addition"
name="design1" objectId="1"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

5.3 METHOD: GetNetworkDesign

Returns the named network design and its contents (That is, group/building/floor/coverage area and so on).

Result: An AesNetworkDesign object

Arguments: AesBusinessSession, AesNetworkDesign key object

5.3.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetNetworkDesign xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="5726" mask="-1"/>
            <AesNetworkDesign name="build1" options="1"/>
        </GetNetworkDesign>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

5.3.2 **SOAP Response**

5.3.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesNetworkDesign changedOn="1170242242845" createdOn="1170242242845"
mask="-2147483648" name="build1" objectId="1">
                <groupList>
                    <AesGroup changedOn="1170242242852" mask="-2147483648"
name="build1_Group" objectId="1" parentId="1">
                <groupList/>
                <buildingList>
                    <AesBuilding changedOn="1170242242858" name="build1" objectId="1"
parentId="1">
                    <floorList>
                        <AesFloor calibrationModel="1" changedOn="1170242242861" is-ext-
key="false" name="floor1" number="2" objectId="1" parentId="1">
                            <coverageAreaList/>
                            <markerList/>
                            <obstacleList/>
                            <apList>
                                <AesAP angle="1.57" apType="2" changedOn="1170242242862"
ipAddress="20.20.20.23" macAddress="00:0b:85:60:02:a0" name="ap:60:02:a0" numOfSlots="2"
objectId="2" parentId="1" switchName="" x="196.1" y="203.2" z="10.0"/>
                            </apList>
                            <viewImage>
                                <AesViewImage imageName="domain_0_1166571980328"
imageType="image/jpg"/>
                            </viewImage>
                            <dimension>
                                <AesDimension height="10.0" length="286.6" width="418.3"/>
                            </dimension>
                            <chokepointList>
                                <AesChokepoint changedOn="1170242242875"
macAddress="00:0c:cc:60:13:a3" name="Choke13A3" objectId="1" parentId="1" range="10.0"
x="262.0" y="57.7" z="10.0"/><AesChokepoint changedOn="1170242242875"
macAddress="00:0c:cc:60:14:e6" name="alpha2" objectId="2" parentId="1" range="5.0"
x="28.9" y="57.7" z="10.0"/>
                                <AesChokepoint changedOn="1170242242876"
macAddress="12:13:14:15:16:17" name="fgh" objectId="3" parentId="1" range="1.1" x="-1.0"
y="-1.0" z="10.0"/>
                            </chokepointList>
                        </floorlist>
                    </AesFloor>
                </AesBuilding>
            </buildingList>
        </AesNetworkDesign>
    </Response>
  </SOAP-ENV:Body>
```

5.4 METHOD: GetNetworkDesignListForService

Returns a list of network design that is assigned to the specified serviceId in the argument.

Result: An AesNetworkDesign object

Arguments: AesBusinessSession, serviceId (0-CAS, 1-WIPS) and options (0-OPT_FULL, 1-OPT_MED, 2-OPT_FULL)

Note: *Default value for "options" is 0 (OPT_FULL), which will return a list of network designs and their contents (i.e. group/building/floor/... and so on) and the map images. When set to*

1 (OPT_MED), only list of network designs and their contents are returned, no map images. When set to 2 (OPT_MIN), only list of network designs is returned, no building/floor, and so on and no map images.

5.4.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
    <GetNetworkDesignListForService options="1" serviceId="0"
          xmlns="http://cisco.com/mse/location" xmlns:typ="http://cisco.com/mse/types">
    <typ:AesBusinessSession id="25562"/></GetNetworkDesignListForService>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

5.4.2 **SOAP Response**

5.4.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesNetworkDesign changedOn="1170242242845" createdOn="1170242242845"
mask="-2147483648" name="build1" objectId="1">
                <groupList>
                    <AesGroup changedOn="1170242242852" mask="-2147483648"
name="build1_Group" objectId="1" parentId="1">
                    <groupList/>
                    <buildingList>
                        <AesBuilding changedOn="1170242242858" name="build1" objectId="1"
parentId="1">
                        <floorList>
                          <AesFloor calibrationModel="1" changedOn="1170242242861" is-ext-
key="false" name="floor1" number="2" objectId="1" parentId="1">
                            <coverageAreaList/>
                            <markerList/>
                            <obstacleList/>
                            <apList>
                                <AesAP angle="1.57" apType="2" changedOn="1170242242862"
ipAddress="20.20.20.23" macAddress="00:0b:85:60:02:a0" name="ap:60:02:a0" numOfSlots="2"
objectId="2" parentId="1" switchName="" x="196.1" y="203.2" z="10.0"/>
                                </apList>
                            <viewImage>
                                <AesViewImage imageName="domain_0_1166571980328"
imageType="image/jpg"/>
                            </viewImage>
                            <dimension>
                                <AesDimension height="10.0" length="286.6" width="418.3"/>
                            </dimension>
                            <chokepointList>
                                <AesChokepoint changedOn="1170242242875"
macAddress="00:0c:cc:60:13:a3" name="Choke13A3" objectId="1" parentId="1" range="10.0"
x="262.0" y="57.7" z="10.0"/><AesChokepoint changedOn="1170242242875"
macAddress="00:0c:cc:60:14:e6" name="alpha2" objectId="2" parentId="1" range="5.0"
x="28.9" y="57.7" z="10.0"/>
                                <AesChokepoint changedOn="1170242242876"
```

```
macAddress="12:13:14:15:16:17" name="fgh" objectId="3" parentId="1" range="1.1" x="-1.0"
y="-1.0" z="10.0"/>
                            </chokepointList>
                    </floorlist>
                </AesFloor>
            </AesBuilding>
          </buildingList>
        </AesNetworkDesign>
      </Response>
   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

5.5 METHOD: GetNetworkDesignForService

Returns the named network design and its contents (building, floor, and so on) that are assigned to the specified serviceId in the argument.

Result: An AesNetworkDesign object

Arguments: AesBusinessSession, AesNetworkDesign key object and serviceId (0-CAS, 1-WIPS)

Note: *Only those buildings and floors in the named Network Design that are assigned to the specified serviceId are included in the return AesNetworkDesign object hireachy even though there may be more buildings and floors in the Network Design*.

5.5.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
<GetNetworkDesignForService serviceId="0" xmlns="http://cisco.com/mse/location"
xmlns:typ="http://cisco.com/mse/types">  <typ:AesBusinessSession id="7190"/>
<AesNetworkDesign name="Campus1"/>
</GetNetworkDesignForService>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

5.5.2 **SOAP Response**

5.5.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesNetworkDesign changedOn="1170242242845" createdOn="1170242242845"
mask="-2147483648" name="build1" objectId="1">
                <groupList>
                    <AesGroup changedOn="1170242242852" mask="-2147483648"
name="build1 Group" objectId="1" parentId="1">
                    <groupList/>
                    <buildingList>
                        <AesBuilding changedOn="1170242242858" name="build1" objectId="1"
parentId="1">
                            <floorList>
                              <AesFloor calibrationModel="1" changedOn="1170242242861" is-ext-
key="false" name="floor1" number="2" objectId="1" parentId="1">
                                    <coverageAreaList/>
                                    <markerList/>
                                    <obstacleList/>
                                    <apList>
```

```
                        <AesAP angle="1.57" apType="2" changedOn="1170242242862"
ipAddress="20.20.20.23" macAddress="00:0b:85:60:02:a0" name="ap:60:02:a0" numOfSlots="2"
objectId="2" parentId="1" switchName="" x="196.1" y="203.2" z="10.0"/>
                        </apList>
                     <viewImage>
                        <AesViewImage imageName="domain_0_1166571980328"
imageType="image/jpg"/>
                     </viewImage>
                     <dimension>
                        <AesDimension height="10.0" length="286.6" width="418.3"/>
                     </dimension>
                     <chokepointList>
                        <AesChokepoint changedOn="1170242242875"
macAddress="00:0c:cc:60:13:a3" name="Choke13A3" objectId="1" parentId="1" range="10.0"
x="262.0" y="57.7" z="10.0"/><AesChokepoint changedOn="1170242242875"
macAddress="00:0c:cc:60:14:e6" name="alpha2" objectId="2" parentId="1" range="5.0"
x="28.9" y="57.7" z="10.0"/>
                        <AesChokepoint changedOn="1170242242876"
macAddress="12:13:14:15:16:17" name="fgh" objectId="3" parentId="1" range="1.1" x="-1.0"
y="-1.0" z="10.0"/>
                     </chokepointList>
                  </floorlist>
               </AesFloor>
            </AesBuilding>
         </buildingList>
      </AesNetworkDesign>
   </Response>
  </SOAP-ENV:Body>
```

5.6 METHOD: GetViewImage

Get the maps from the server. This GetViewImage gets a view image from the MSE. The actual image is an attachment, that is never logged (its binary).

Result: AesViewImage with the name object

Arguments: AesBusinessSession, AesViewImage key objects

5.6.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
  <SOAP-ENV:Body>
    <GetViewImage xmlns=" http://cisco.com/mse/location">
       <AesBusinessSession id="8928" mask="-1"/>

       <AesViewImage imageName="domain_0_1168046305321" imageType="image/gif"/>

    </GetViewImage>

  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

5.6.2 **SOAP Response**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesViewImage imageName="domain_0_1168046305321" imageType="image/gif"/>
    </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

CHAPTER 6

6 Location – Common Definitions

Note: *Location related requests should go to* **https://mse/location/** *endpoint.*

6.1 Mobile Station

Mobile Stations represent 802.11 clients on the network. The external key is macAddress.

Class	AesMobileStation		
	Attribute	**Type**	**Access**
	macAddress	String	RO
	ipAddress	String	RO
	username	String	RO
	apMacAddress	String	RO
	apSlotId	Int	RO
	band	Band (enum) UNKNOWN IEEE_802_11_A IEEE_802_11_B	RO
	ssId	String	RO
	aid	Int	RO
	status	Int DEFAULT VALUE =	RO

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		STATUS_UNKNOWN = -1;	STATUS_UNKNOW N
		STATUS_IDLE = 0;	
		STATUS_AAA_PENDING = 1;	
		STATUS_AUTHENTICATED = 2;	
		STATUS_ASSOCIATED = 3;	
		STATUS_POWERSAVE = 4;	
		STATUS_DISASSOCIATED = 5;	
		STATUS_TO_BE_DELETED = 6;	
		STATUS_PROBING = 7;	
		STATUS_BLACK_LISTED = 8;	
	reasonCode	Int 0 noReasonCode - Normal operation. 1 unspecifiedReason - Client associated but no longer authorized. 2 previousAuthNotValid - Client associated but not authorized. 3 deauthenticationLeaving - The access point went offline, deauthenticating the client. 4 disassociationDueToInactivity - Client session timeout exceeded. 5 disassociationAPBusy - The access point is busy, performing load balancing, for example. 6 class2FrameFromNonAuthStatio n - Client attempted to transfer data before it was authenticated.	RO Default value = 0. The reason code as defined in the 802.11 standards

		7 class2FrameFromNonAssStation -Client attempted to transfer data before it was associated. 8 disassociationStaHasLeft - Operating System moved the client to another access point using non-aggressive load balancing. 9 staReqAssociationWithoutAuth - Client not authorized yet, still attempting to associate with an access point. 99 missingReasonCode - Client momentarily in an unknown state.	
	mobilityStatus	Int	RO Default Value =0
	anchorAddress	String	RO
	cfPollable	Int	RO
	cfPollRequest	Int	RO
	channelAgilityEnabled	Int	RO
	pbccOptionImplemented	Int	RO
	shortPreambleOptionImplemented	Int	RO
	sessionTimeout	Int	RO
	authenticationAlgorithm	Int	RO Default Value =0
	wepStatus	Int	RO

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			Default Value =0
	portNumber	int	RO
	policyManagerState	String	RO
	securityPolicyStatus	Int SECURITY_POLICY_STATUS_C OMPLETED = 0; SECURITY_POLICY_STATUS_N OT_COMPLETED = 1;	RO Default Value =0
	Protocol	Int PROTOCOL_DOT11A = 1; PROTOCOL_DOT11B = 2; PROTOCOL_DOT11G = 3; PROTOCOL_UNKNOWN = 4; PROTOCOL_MOBILE = 5; PROTOCOL_DOT11N24 = 6; PROTOCOL_DOT11N5 = 7;	RO Default Value =4 PROTOCOL_UNKO WN
	mirrorMode	Int	RO
	interfaceStr	String	RO
	apMode	Int Local =0; Monitor = 1; REAP = 2; Rogue Dectector=3; Sniffer=4; Bridge=5; Spectrum Expert=6;	RO DEFAULT VALUE=0
	vlanId	Int	RO
	statusCode	Int 0 idle Normal operation — no rejections of client association requests. 1 aaaPending — Completing an	RO DEFAULT VALUE=0

		AAA transaction.	
		2 authenticated — 802.11 authentications completed.	
		3 associated — 802.11 associations completed.	
		4 powersave — Client in powersave mode.	
		5 disassociated — 802.11 disassociation completed.	
		6 tobedeleted — To be deleted after disassociation.	
		7 probing — Client not associated or authorized yet.	
		8 disabled — Automatically disabled by Operating System for an operator-defined time.	
	switchRef	AesRef	RO
	policyType	Int POLICY_TYPE_DOT1X = 0; POLICY_TYPE_WPA1 = 1; POLICY_TYPE_WPA2 = 2; POLICY_TYPE_WPA2VFF = 3; POLICY_TYPE_NOTAVAILABLE = 4; POLICY_TYPE_UNKNOWN = 5;	RO
	encryptionCypher	Int ENC_CYPHER_CCMPAES = 0;	RO

		ENC_CYPHER_TKIPMIC = 1;	
		ENC_CYPHER_WEP40 = 2;	
		ENC_CYPHER_WEP104 = 3;	
		ENC_CYPHER_WEP128 = 4;	
		ENC_CYPHER_NONE = 5;	
		ENC_CYPHER_NOTAVAILABLE = 6;	
		ENC_CYPHER_UNKNOWN = 7;	
	eapType	Int EAP_TYPE_EAPTLS = 0; EAP_TYPE_TTLS = 1; EAP_TYPE_PEAP = 2; EAP_TYPE_LEAP = 3; EAP_TYPE_SPEKE = 4; EAP_TYPE_EAPFAST = 5; EAP_TYPE_NOTAVAILABLE = 6; EAP_TYPE_UNKNOWN = 7;	RO
	ccxVersion	Int	RO
	e2eVersion	Int	RO
	asset	AesAsset	RO
Class	CCXServiceInfo		
	Attribute	**Type**	**Access**
	serviceType	short Enum: UNKNOWN = 0	RO

		LEVEL_1 = 1 LEVEL_2 = 2	
	serviceLevel	short Enum: UNKNOWN = 0x0 LOCATION = 0x4C MANAGEMENT = 0x4D VOICE = 0x56	RO
Class	EndpointIPAddress		
	Attribute	**Type**	**Access**
	ipAddress	String	RO
	ipVersion	Byte Enum: UNKNOWN = 0 IPv4 = 1 IPv6 = 2	RO
	ipEntity	Byte Enum: UNKNOWN = 0 WIRELESS_CLIENT = 1 WIRED_CLIENT = 2 ANCHOR_CONTROLLER = 3 WIRED_SWITCH_PORT = 4	RO

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Class	AesAsset		
	Attribute	**Type**	**Access**
	Group	String	RO
	Name	String	RO
	Category	String	RO

6.2 Statistics

Both mobile station and tag statistics share the following class:

Class	AesBaseStats		
	Attribute	**Type**	**Access**
	macAddress	**String**	**RO**
	packetsSent	long	RO
	packetsRecv	long	RO
	bytesSent	long	RO
	bytesRecv	long	RO
	policyErrors	long	RO

6.3 Location

All classes MobileStation, Tag, RogueClient and RogueAP share a similar definition for their location objects. Lat/Long/Altitude is not currently calculated by the product and will be returned as 0.0f for all located entities.

Class	Aes<MobileStation|Tag|RogueClient|RogueAP>Location		
AesBase Location	**Attribute**	**Type**	**Access**
	macAddress	**String**	**RO**
	Units	int (Enum)	RO
	floorId	long	RO
	X	float	RO

	Y	float	RO
	Z	float	RO
	confidenceFactor	float	RO
	minLastHeardSecs *The most recent lastHeardSecs value from the network. So if a location was calculated based measurement values on 10, 100 and 2000 secs ago then the most recent time the entity was seen was 10 secs ago.* *To calculate the correct absolute time adds this value to the changedOn timestamp of the location record. This will give a close approximation to when the last rssi measurement was taken in absolute time*	int	RO
	sourceTimestamp *The value of the Source Object's ChangedOn field, if this object is a copy of* another source object (e.g - the entry in History table)*	long	RO
	simpleHierarchy A textual representation of the floorHierarchy using a simple format Eg: simpleHierarchy="Simulator>Building1>Floor1" Here Simulator-Network Design name Bulding – Building Name Floor1 – Floor Name	String	RO
	fullHierarchy A textual representation of the floorHierarchy that includes all details. Eg: fullHierarchy="AesNetworkDesign:Simulator|AesGroup:Simulator_group|AesBuilding:Building1|AesF	String	RO

	loor:Floor1"		
	networkStatus Whether the ACTIVE-2/INACTIVE -1or LEGACY-0	int	RO

	confidenceFactor
	
	With every calculated location (say x1, y1), a confidence factor (err_ft) is returned. This is a floating point scalar used to calculate 95% confidence square. The device is estimated to be inside the square centered at (x1, y1) with sides 2 x (err_ft) with 95% confidence. In other words, given that the estimated location is (x1, y1), there is a 95% confidence that the device is within the box defined below.
	
	`<---  2 x (err_ft) --- >`
	`------------------------`
	`|                        | ^`
	`|                        | |`
	`|                        | |`
	`|                        | |`
	`|           +            | 2x (err_ft)`
	`|        (x1,y1)         | |`
	`|                        | |`
	`|                        | |`
	`|                        | |`
	`|                        | v`
	`------------------------`
	
	Note that this confidence factor is calculated assuming that the device is located on correct floor
		float	RO

	floorWeight Higher floorwt = higher possibility of it being this floor. Used in the event of multiplelbs reporting	int	RO

	same element.		
	floorHierarchy	Array of Objects	RO
	info	AesObject	RO
	detectingControllers	string	RO
	neighborhoodData	AesNeighborhoodData	RO
	civicAddress	List of AesCivicAddress	RO
Addition to AesTagLocation	lastChokepointMac	String	RO
	chokepointEncounterTime	Date	RO
	locationContributorMask CHOKEPOINT = 0x01; RSSI = 0x02; TDOA = 0x04;	Short	RO
	calcX X value with respect of presence choke pointer	float	RO
	calcY Y value with respect of presence choke pointer i.e. when mask = CHOKEPOINT	float	RO
	calcZ Z value with respect of presence choke pointer i.e. when mask =	float	RO

	CHOKEPOINT		
	calcFloorId Floor Identifier with respect of presence choke pointer i.e. when mask = CHOKEPOINT	long	RO

Class	AesNeighborhoodData		
	Attribute	**Type**	**Access**
	closestApMacAddress	String	RO
	closestApName	String	RO

6.4 History

All classes (Station, Tag, RogueClient and RogueAP) have a similar history object. RogueClient and RogueAP do not have statistics so that attribute is not defined.

Class	Aes<MobileStation|Tag|RogueAP|RogueClient>History		
	Attribute	**Type**	**Access**
	macAddress	String	RO
	From	long	RO
	To	long	RO
	infoList	A collection of Aes<MobileStation|Tag|RogueClient|RogueAP>Info	RO
	statsList	A collection of AesBaseStats (only valid for Stations and Tags)	RO
	locationList	A collection of Aes<MobileStation|Tag|RogueClient|RogueAP>Location	RO
	Reason	byte	RO

		enum{ PERIODIC, FLOOR_CHANGE, CHOKEPOINT_CHANGE, INOUT_OF_AREA, SIGNIFICANT_MOVEMENT, LOCP_MESSAGE, INFORMATION_CHANGE }	

Class	AesHistoryQueryInfoArgs		
	Attribute	**Type**	**Access**
	macAddress	String	RO
	fromTimeMillis	long	RO
	toTimeMillis	long	RO
	status	int	RO
	startIndex	int	RO
	isCountQuery	boolean	RO
	numOfResults	Int	RW
	ccxServiceInfo	CCXServiceInfo object	RO
	username	String	RO

Class	AesHistoryQueryArgs		
	Attribute	**Type**	**Access**
	macAddress	String	RO
	fromTimeMillis	long	RO

	toTimeMillis	long	RO	
	floorId	long	RO	
	startIndex	int	RO	
	isCountQuery	boolean	RO	
	numOfResults	Int	RW	

6.5 Tag

Class	AesTag			
	Attribute	**Type**	**Access**	**Description**
	macAddress	String	RW	Mac Address of the tag
	Type	Int (enum)	RO	Tag types TYPE_UNKNOWN =0 TYPE_TYPE1 =2
	timeInterval	Int	RO	timeInterval between beacons
	lastReported	Int	RO	When the tag was last reported
	batteryStatus	Int (enum)	RO	STATUS_UNKNOWN=0;STATUS_LOW =1;STATUS_NORMAL=2;STATUS_MEDIUM =3
	switchName	String	RO	To Which Controller it is detected
	Asset	AesAsset	RO	Asset info
	telemetryList	AesTelemetry	RO	Tag Telemetry Info
	batteryInfo	AesBatteryInfo	RO	Tag battery Info
	vendorData	AesVendorData	RO	Vendor specific Data
	emergencyList	List of AesEmergency	RO	Tag emergency info
	chokepointEncounterList	Listof AesChokepointE	RO	Encounted chokepoint tags

	ncounter			
	perimeterCh okepointEnc ounter	AesChokepointE ncounter	RO	last "perimeter" chokepoint encounter
	propertiesM ask	Int PROP_RECOG NIZES_PERIME TER_CPS = 0x01	RO	This mask has a bit set if at any time we receive a perimeter chokepoint group from the tag. If we never do, the flag is 0
	lastBeacon Time	Date	RO	Last time we heard from the tag
	Version	int	RO	version of the Tag

Class	AesAsset		
	Attribute	**Type**	**Access**
	assetGroup	String	RO
	assetName	String	RO
	assetCategory	String	RO

Note: *By default, the AesTelemetry object will include 2 child elements objectId and the AesDefaultTelemMeasurement.   If the API user prefers to get only one of the above, there is a flag on the MSE which can be used to change which format needs to be included in the AesTelemetryObject. The old element is for backward compatibility*.

Class	AesTelemetry		
	Attribute	**Type**	**Access**
	type	TelemetryType enum : Options: UNKNOWN, GPS, TEMPERATURE, MOTION, DISTANCE, FUEL, QUANTITY, PRESSURE,	RW

		HUMIDITY, STATUS, EPC, MOTIONPRO	
	measurementObject	String	RW
	measurementClass	String	
	units	String	RW
	lastReceivedTime	Date	RW
	lastReceivedSeqNum	int	RW
	objectId	objectId	RW
	AesDefaultTelemMeasurement	AesDefaultTelemMeasurement	RW

Class	AesVendorData		
	Attribute	**Type**	**Access**
	vendorId	int	RW
	elementId	short	RW
	data	byte[]	RW
	lastReceivedTime	Date	RW

Class	AesChokepointEncounter		
	Used to store /communicate the tag encountering a chokepoint.		
	Attribute	**Type**	**Access**
	chokepointMac	String	RW

	Timestamp	Date	RW
	inRange	Boolean	RW
	isPerimeter	PerimeterType(enum) PERIMETER NON_PERIMETER UNKNOWN	RW
	isActive	bollean	RW
	assocFloorId	long	RW
	index	short	RW

Class	AesEmergency Stores all emergencies reported by a ctx tag.		
	Attribute	**Type**	**Access**
	reason	int REASON_PANIC_BUTTON = 0x00 REASON_DETACHED = 0x01 REASON_TAMPERING = 0x02 REASON_UNKNOWN = 0x03 REASON_PANIC_DETACHED = 0x04 REASON_PANIC_TAMPERING = 0x05 REASON_TAMPERING_DETACHED= 0x06	RW
	tamperState	Int Options: TAMPER_STATE_INACTIVE=0x00; TAMPER_STATE_ACTIVE=0x01;	RW
	tamperOpenedCount	int	RW
	lastRecivedTime	Date	RW

	isActive	boolean	RW

Note:

- *If reason = REASON_TAMPERING or REASON_PANIC_TAMPERING or REASON_TAMPERING_DETACHED then the tamperState and tamperOpenedCount data will be valid, else it will be empty or invalid.*

- *tamperOpenedCount holds the number of times a tag has been opened*.

Class	AesBatteryInfo		
	Attribute	**Type**	**Access**
	tolerance	int	RW
	percentRemaining	int	RW
	daysRemaining	int	RW
	batteryAge	long	RW
	lastReceivedTime	Date	RW
	lastReceivedSeqNum	int	RO
Class	AesDefaultTelemetryMeasurement		
	Attribute	**Type**	**Access**
	measurementObj	String	RO
	measurementClass	String	RO
	byteBlob	String	RO

All telemetry types that can be represented by simple java types are stored as AesDefaultTelemetryMeasurement objects.

The following table specifies which of the Telemetry types are stored in this manner. For each telemetry type, the java object type that is held in the measurementObj data member is specified below. The measurementClass holds the name of the class.

TelemetryType	**measurementObj**	**measurementClass**
TelemetryType.TEMPERATURE	Float	"java.lang.Float"
TelemetryType.MOTION	Float	"java.lang.Float"

TelemetryType.DISTANCE	Float	"java.lang.Float"
TelemetryType.FUEL	Float	"java.lang.Float"
TelemetryType.QUANTITY	Long	"java.lang.Long"
TelemetryType.PRESSURE	Float	"java.lang.Float"
TelemetryType.HUMIDITY	Integer	"java.lang.Integer"
TelemetryType.STATUS	String	"java.lang.String"

6.6 Rogue Client

Class	AesRogueClient		
	Attribute	**Type**	**Access**
	macAddress	String	RO
	numOfDetectingAPs	int	RO
	firstReported	String	RO
	lastReported	String	RO
	Bssid	String	RO
	containmentLevel	int	RO
	State	int	RO
	switchRef	AesRef	RO

6.7 Rogue AP

Class	AesRogueAP		
	Attribute	**Type**	**Access**
	macAddress	String	RO
	numOfDetectingAPs	int	RO
	firstReported	String	RO
	lastReported	String	RO
	type	int (enum) TYPE_AP = 0 TYPE_ADHOC = 1	RO

		int (enum) CONTAIN_UNASSIGNED = 0 CONTAIN_LEVEL1 = 1 CONTAIN_LEVEL2 = 2 CONTAIN_LEVEL3 = 3 CONTAIN_LEVEL4 = 4	
	containmentLevel		RO
	state	int (enum) STATE_INITIALIZING=0 STATE_PENDING=1 STATE_ALERT=2 STATE_DETECTEDLRAD=3 STATE_KNOWN=4 STATE_ACKNOWLEDGE=5 STATE_CONTAINED=6 STATE_THREAT=7 STATE_CONTAINEDPENDING=8 STATE_KNOWNCONTAINED=9	RO

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		STATE_TRUSTEDMISSING=10	
	totalClients	int	RO
	onNetworks	Boolean	RO
	maxDetectedRssi	int	RO
	ssid	String	RO
	detectingAPRadioType	int	RO
	maxDetectingAPMacAddress	String	RO
	maxRssiRadioType	int	RO
	switchRef	AesRef	RO

6.8 Wired Client

Class	Device		
	Attribute	**Type**	**Access**
	serialNumber	String	RO
	udi	int	RO
	identity	String	RO
	type	int Client(1), Tag(2), Rogue(3), Interferer(4), WiredSwitch(5), WirelessController(6), AccessPoint(7)	RO
	modelNum	String	RO
	softwareVer	String	RO
	epInterfaceList	List of WiredInterface	RO
	location	Location	RO
	locationId	long	RO

Class	Location		
	Attribute	**Type**	**Access**
	elin	String	RO
	parent	CAMPUS(1), BUILDING(2), FLOOR(3), WIREDSWITCH(4), WIREDSWITCH_PORT(5)	RO
	civicAddress	List of AesCivicAddress	RO

Class	WiredInterface		
	Attribute	**Type**	**Access**
	ipAddress	String	RO
	macAddress	String	RO
	username802Dot1x	String	RO
	type	Int Wired(1) Wireless(2)	RO
	portAssocList	List<WiredPortAssociation>	RO
	vlanId	int	RO
	vlanName	String	RO
	switchIpAddress	String	RO
	portNumber	short	RO

	slotNumber	short	RO
	state	Byte	RO
	moduleNumber	Short	RO
	portType	byte	RO

Class	WiredPortAssociation		
	Attribute	**Type**	**Access**
	portId	long	RO
	state	byte	RO
	transitionTime	long	RO
	switchIpAddress	String	RO
	slotNumber	short	RO
	portNumber	short	RO
	duplicate	boolean	RO
	moduleNumber	short	RO
	portType	byte	RO

Class	WiredSwitch		
	Attribute	**Type**	**Access**
	ipAddress	String	RO
	extendParentCivicData	boolean	RO
	device	List of Device Object	RO
	macAddress	String	RO
	aesUID	long	RO
	portList	Listof WiredSwitchPort	RO

Class	WiredSwitchPort		
	Attribute	**Type**	**Access**
	ipAddress	String	RO
	extendParentCivicData	boolean	RO
	useParentCivicData	boolean	RO
	portNumber	int	RO
	slotNumber	int	RO
	location	List of Location	RO

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CHAPTER 7

7 Location – STATION

The station interface concentrates on the following areas for mobile stations:

- Calculation of real-time location

- Calculation of statistics

- Historical collection of Location and Statistics

7.1 METHOD: GetStationInfoList

Queries a list of mobile stations currently stored in the MSE. The query can be:

- NULL - Return all mobile stations and their contents.

- Count Query - Return the number of mobile stations in the server

- All other queries (sorting, paging, member match and so on) - The list of mobile stations and their content, constrained based on the query content.

- With v7.2 onwards, there is also support for partial IP Address search. If you are performing a partial IP Address search it makes more sense to use a LIKE or NOT_LIKE, however other operators are acceptable input too.

Important note: For existing application(pre-v7.2) if there are both ip v4 and v6 addresses then the ipaddress attribute in the AesMobilestation object will contain the first ipv4 address and the other Ips will be sent in the EndpointIPAddress element. If there is no IP v4 address (there may or may not be IPv6 addresses) the ipAddress attribute will be empty. New Applications should rely only on the EndpointIPAddress element to get the ip address and not use the ipaddress attribute.

Result: See below.

Arguments: AesBusinessSession, AesQueryCriteria

7.1.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
 <SOAP-ENV:Body>
<GetStationInfoList xmlns="http://cisco.com/mse/location"
                             xmlns:typ="http://cisco.com/mse/types">
    <typ:AesBusinessSession id="14659"/>
    <typ:AesQueryCriteria startIndex="2" numOfResults="3"/>
</GetStationInfoList>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.1.2 **SOAP Response**

7.1.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
 <SOAP-ENV:Body>
  <Response xmlns="http://cisco.com/mse/location" xmlns:
           SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
       <AesMobileStation aid="5" anchorAddress="0.0.0.0"
        apMacAddress="00:00:13:01:4c:00" ccxVersion="5" changedOn="1302695804046"
        eapType="6" encryptionCypher="3" essIndex="1" interfaceStr="management"
        ipAddress="142.0.49.18" macAddress="00:00:31:02:12:11" mobilityStatus="1"
        objectId="13763" policyManagerState="RUN" policyType="4" portNumber="13"
        protocol="2" reasonCode="1" ssId="open" status="3" switchRef="av-talwar1"
        type="2" vlanId="142">
           <EndpointInterface macAddress="00:1c:58:cd:48:81" ipAddress="1.2.3.4"
username802Dot1x="Sameer">
             <EndpointIPAddress entity="WIRELESS_CLIENT" ipAaddress="10.10.1.2"
version="IPv4"/>
             <EndpointIPAddress entity="WIRELESS_CLIENT"
ipAddress="fdda:5cc1:23:4::1f" version="IPv6"/>
             <EndpointIPAddress entity="WIRELESS_CLIENT"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
           </EndpointInterface>
           <EndpointIPAddress  entity="ANCHOR_CONTROLLER" ipAddress="10.10.2.4"
version="IPv4"/>
           <EndpointIPAddress entity="ANCHOR_CONTROLLER"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
           <CCXServiceInfo serviceType="VOICE" serviceLevel="LEVEL_1"/>
           <CCXServiceInfo serviceType="LOCATION" serviceLevel="LEVEL 2"
serviceName="LS1:S60,LS2:S69"/>
         </AesMobileStation>

       <AesMobileStation aid="12" anchorAddress="0.0.0.0"
        apMacAddress="00:00:13:01:4b:00" ccxVersion="5" changedOn="1302695804043"
        eapType="6" encryptionCypher="3" essIndex="1" interfaceStr="management"
        ipAddress="142.0.49.11" macAddress="00:00:31:02:12:0a" mobilityStatus="1"
        objectId="13767" policyManagerState="RUN" policyType="4" portNumber="13"
        protocol="2" reasonCode="1" ssId="open" status="3" switchRef="av-talwar1"
        type="2" vlanId="142">
           <EndpointInterface macAddress="00:1c:58:cd:48:81" ipAddress="1.2.3.4"
username802Dot1x="Sameer">
             <EndpointIPAddress entity="WIRELESS_CLIENT" ipAaddress="10.10.1.2"
version="IPv4"/>
             <EndpointIPAddress entity="WIRELESS_CLIENT"
ipAddress="fdda:5cc1:23:4::1f" version="IPv6"/>
             <EndpointIPAddress entity="WIRELESS_CLIENT"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
           </EndpointInterface>
```

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```
                <EndpointIPAddress  entity="ANCHOR_CONTROLLER" ipAddress="10.10.2.4"
version="IPv4"/>
                <EndpointIPAddress entity="ANCHOR CONTROLLER"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
                <CCXServiceInfo serviceType="VOICE" serviceLevel="LEVEL_1"/>
                <CCXServiceInfo serviceType="LOCATION" serviceLevel="LEVEL_2"
serviceName="LS1:S60,LS2:S69"/>
            </AesMobileStation>

        <AesMobileStation aid="13" anchorAddress="0.0.0.0"
          apMacAddress="00:00:13:01:4b:00" ccxVersion="5" changedOn="1302695804043"
          eapType="6" encryptionCypher="3" essIndex="1" interfaceStr="management"
          ipAddress="142.0.49.12" macAddress="00:00:31:02:12:0b" mobilityStatus="1"
          objectId="13768" policyManagerState="RUN" policyType="4" portNumber="13"
          protocol="2" reasonCode="1" ssId="open" status="3" switchRef="av-talwar1"
          type="2" vlanId="142">
                <EndpointInterface macAddress="00:1c:58:cd:48:81" ipAddress="1.2.3.4"
username802Dot1x="Sameer">
                <EndpointIPAddress entity="WIRELESS_CLIENT" ipAaddress="10.10.1.2"
version="IPv4"/>
                <EndpointIPAddress entity="WIRELESS_CLIENT"
ipAddress="fdda:5cc1:23:4::1f" version="IPv6"/>
                <EndpointIPAddress entity="WIRELESS_CLIENT"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
            </EndpointInterface>
                <EndpointIPAddress  entity="ANCHOR_CONTROLLER" ipAddress="10.10.2.4"
version="IPv4"/>
                <EndpointIPAddress entity="ANCHOR_CONTROLLER"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
                <CCXServiceInfo serviceType="VOICE" serviceLevel="LEVEL_1"/>
                <CCXServiceInfo serviceType="LOCATION" serviceLevel="LEVEL_2"
serviceName="LS1:S60,LS2:S69"/>
            </AesMobileStation>

  </Response>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.2 METHOD: GetStationInfo

Returna an AesMobileStation currently stored in the MSE based on various search criteria.

Result: An AesMobileStation object or null if not found.

Arguments: AesBusinessSession, AesMobileStation Key

7.2.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetStationInfo xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesMobileStation macAddress="00:01:02:03:04:05"/>
        </GetStationInfo>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.2.2 SOAP Response

7.2.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
```

```
        <Response xmlns=" http://cisco.com/mse/location">
            <AesMobileStation     ipAddress="12.1.1.1"     macAddress="00:01:02:03:04:05"
username="fred"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.3 METHOD: GetStationStats

Returns an AesMobileStation statistics record currently stored in the MSE based on various search criteria.

Result: An AesBaseStats object or null if not found

Arguments: AesBusinessSession, AesMobileStation Key

7.3.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetStationStats xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesMobileStation macAddress="00:01:02:03:04:05"/>
        </GetStationStats>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.3.2 **SOAP Response**

7.3.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesBaseStats        macAddress="00:01:02:03:04:05"        packetsSent="12"
bytesSent="1221111"     packetsRecv="1111"        bytesRecv="1212204"        policyErrors="0"
changedOn="1220324324"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.4 METHOD: GetStationStatsList

Queries the list of AesBaseStats statistics record currently stored in the MSE. The query can be:

- NULL - Return all mobile station statistics and their contents.

- Count Query - Return the number of mobile station statistics in the server.

- All other queries (sorting, paging, member match and so on) - The list of mobile station statistics and their content, constrained based on the query content.

- With v7.2 onwards, there is also support for partial IP Address search. If you are performing a partial IP Address search it makes more sense to use a LIKE or NOT_LIKE, however other operators are acceptable input too.

Result: See below.

Arguments: AesBusinessSession, AesQueryCriteria

7.4.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
   <GetStationStatsList xmlns="http://cisco.com/mse/location"
                                      xmlns:typ="http://cisco.com/mse/types">
     <typ:AesBusinessSession id="14030"/>
     <typ:AesQueryCriteria startIndex="2" numOfResults="3"/>
   </GetStationStatsList>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.4.2 **SOAP Response**

7.4.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
 <SOAP-ENV:Body>
   <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
                              ENV="http://schemas.xmlsoap.org/soap/envelope/">
<AesBaseStats changedOn="1302696150391" macAddress="00:00:31:02:00:80" objectId="7228"/>
<AesBaseStats changedOn="1302696150391" macAddress="00:00:31:02:00:81" objectId="7229"/>
<AesBaseStats changedOn="1302696150391" macAddress="00:00:31:02:00:82" objectId="7230"/>
   </Response>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.5 METHOD: GetStationLocation

Returns an AesMobileStationLocation location record currently stored in the MSE.

Result: An AesMobileStationLocation object or null if not found.

Arguments: AesBusinessSession, AesMobileStation Key

7.5.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
   <SOAP-ENV:Body>
       <GetStationLocation xmlns=" http://cisco.com/mse/location">
           <AesBusinessSession id="10510"/>
           <AesMobileStation macAddress="00:01:02:03:04:05"/>
       </GetStationLocation>
   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.5.2 **SOAP Response**

7.5.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesMobileStationLocation                   macAddress="00:01:02:03:04:05"
changedOn="122122111" floorId="10" x="12.1" y="34.6" z="2"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.6 METHOD: GetStationLocationList

Queries the list of AesMobileStationLocation records currently stored in the MSE. The query can be:

- NULL - Return all mobile station locations and their contents.

- Count Query - Return the number of mobile station locations in the server.

- All other queries (sorting, paging, member match and so on) - The list of mobile station locations and their content, constrained based on the query content.

- With v7.2 onwards, there is also support for partial IP Address search. If you are performing a partial IP Address search it makes more sense to use a LIKE or NOT_LIKE, however other operators are acceptable input too.

Important note: For existing application(pre-v7.2) if there are both ip v4 and v6 addresses then the ipaddress attribute in the AesMobilestation object will contain the first ipv4 address and the other Ips will be sent in the EndpointIPAddress element. If there is no IP v4 address (there may or may not be IPv6 addresses) the ipAddress attribute will be empty. New Applications should rely only on the EndpointIPAddress element to get the ip address and not use the ipaddress attribute.

Result: See below.

Arguments: AesBusinessSession, AesQueryCriteria

7.6.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<GetStationLocationList xmlns="http://cisco.com/mse/location"
xmlns:typ="http://cisco.com/mse/types">
        <typ:AesBusinessSession id="23108"/>
        <typ:AesQueryCriteria startIndex="2" numOfResults="3"/>
    </GetStationLocationList>
```

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```
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.6.2 **SOAP Response**

7.6.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
      <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <AesMobileStationLocation changedOn="1302695990441" confidenceFactor="168.0"
         detectingControllers="172.19.28.177" firstActiveAt="1302695543699"
         floorAesUId="-6104764736694386565" floorId="4131" floorWeight="37"
         macAddress="00:00:31:02:1b:2e" minLastHeardSecs="14" networkStatus="1"
         objectId="15071" reason="0" sourceTimestamp="1302695990441" x="5304.0"
         y="3008.0">
         <info>
           <AesMobileStation aid="14" anchorAddress="0.0.0.0"
            apMacAddress="00:00:13:01:f2:00" ccxVersion="5" changedOn="1302721432506"
            eapType="6" encryptionCypher="3" essIndex="1" interfaceStr="management"
            ipAddress="142.0.58.47" macAddress="00:00:31:02:1b:2e" mobilityStatus="1"
            objectId="14689" policyManagerState="RUN" policyType="4" portNumber="13"
            protocol="2" reasonCode="1" ssId="open" status="3" switchRef="av-talwar1"
            type="2" vlanId="142">
             <EndpointInterface macAddress="00:1c:58:cd:48:81" ipAddress="1.2.3.4"
username802Dot1x="Sameer">
              <EndpointIPAddress entity="WIRELESS CLIENT" ipAaddress="10.10.1.2"
version="IPv4"/>
              <EndpointIPAddress entity="WIRELESS_CLIENT"
ipAddress="fdda:5cc1:23:4::1f" version="IPv6"/>
              <EndpointIPAddress entity="WIRELESS_CLIENT"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
             </EndpointInterface>
             <EndpointIPAddress  entity="ANCHOR_CONTROLLER" ipAddress="10.10.2.4"
version="IPv4"/>
             <EndpointIPAddress entity="ANCHOR_CONTROLLER"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
             <CCXServiceInfo serviceType="VOICE" serviceLevel="LEVEL_1"/>
             <CCXServiceInfo serviceType="LOCATION" serviceLevel="LEVEL 2"
serviceName="LS1:S60,LS2:S69"/>
           </AesMobileStation>
          </info>
        </AesMobileStationLocation>
        <AesMobileStationLocation changedOn="1302695990341" confidenceFactor="120.0"
          detectingControllers="172.19.28.177" firstActiveAt="1302695543707"
          floorAesUId="-6104764736694386565" floorId="4131" floorWeight="48"
         macAddress="00:00:31:02:1b:30" minLastHeardSecs="14" networkStatus="1"
         objectId="15072" reason="0" sourceTimestamp="1302695990341" x="5304.0"
         y="3008.0">
          <info>
            <AesMobileStation aid="2" anchorAddress="0.0.0.0"
            apMacAddress="00:00:13:01:f3:00" ccxVersion="5" changedOn="1302721432506"
            eapType="6" encryptionCypher="3" essIndex="1" interfaceStr="management"
            ipAddress="142.0.58.49" macAddress="00:00:31:02:1b:30" mobilityStatus="1"
            objectId="14690" policyManagerState="RUN" policyType="4" portNumber="13"
            protocol="2" reasonCode="1" ssId="open" status="3" switchRef="av-talwar1"
            type="2" vlanId="142">
            <EndpointInterface macAddress="00:1c:58:cd:48:81" ipAddress="1.2.3.4"
username802Dot1x="Sameer">
              <EndpointIPAddress entity="WIRELESS_CLIENT" ipAaddress="10.10.1.2"
version="IPv4"/>
              <EndpointIPAddress entity="WIRELESS CLIENT"
ipAddress="fdda:5cc1:23:4::1f" version="IPv6"/>
              <EndpointIPAddress entity="WIRELESS CLIENT"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
            </EndpointInterface>
            <EndpointIPAddress  entity="ANCHOR_CONTROLLER" ipAddress="10.10.2.4"
```

```
version="IPv4"/>
              <EndpointIPAddress entity="ANCHOR CONTROLLER"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
              <CCXServiceInfo serviceType="VOICE" serviceLevel="LEVEL 1"/>
              <CCXServiceInfo serviceType="LOCATION" serviceLevel="LEVEL_2"
serviceName="LS1:S60,LS2:S69"/>
          </AesMobileStation>
        </info>
      </AesMobileStationLocation>
      <AesMobileStationLocation changedOn="1302695991041" confidenceFactor="72.0"
       detectingControllers="172.19.28.177" firstActiveAt="1302695543715"
       floorAesUId="-6104764736694386565" floorId="4131" floorWeight="67"
       macAddress="00:00:31:02:1b:31" minLastHeardSecs="14" networkStatus="1"
       objectId="15073" reason="0" sourceTimestamp="1302695991041" x="5304.0"
       y="3008.0">
        <info>
          <AesMobileStation aid="3" anchorAddress="0.0.0.0"
           apMacAddress="00:00:13:01:f3:00" ccxVersion="5" changedOn="1302721432507"
           eapType="6" encryptionCypher="3" essIndex="1" interfaceStr="management"
           ipAddress="142.0.58.50" macAddress="00:00:31:02:1b:31" mobilityStatus="1"
           objectId="14691" policyManagerState="RUN" policyType="4" portNumber="13"
           protocol="2" reasonCode="1" ssId="open" status="3" switchRef="av-talwar1"
           type="2" vlanId="142">
            <EndpointInterface macAddress="00:1c:58:cd:48:81" ipAddress="1.2.3.4"
username802Dot1x="Sameer">
              <EndpointIPAddress entity="WIRELESS_CLIENT" ipAaddress="10.10.1.2"
version="IPv4"/>
              <EndpointIPAddress entity="WIRELESS_CLIENT"
ipAddress="fdda:5cc1:23:4::1f" version="IPv6"/>
              <EndpointIPAddress entity="WIRELESS_CLIENT"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
            </EndpointInterface>
            <EndpointIPAddress  entity="ANCHOR CONTROLLER" ipAddress="10.10.2.4"
version="IPv4"/>
            <EndpointIPAddress entity="ANCHOR_CONTROLLER"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
            <CCXServiceInfo serviceType="VOICE" serviceLevel="LEVEL_1"/>
            <CCXServiceInfo serviceType="LOCATION" serviceLevel="LEVEL_2"
serviceName="LS1:S60,LS2:S69"/>
          </AesMobileStation>
        </info>
      </AesMobileStationLocation>
    </Response>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.7 METHOD: GetStationLocationListByArgs

Queries the list of AesMobileStationLocation location records currently stored in the MSE. The query can be:

- Count Query—Return the number of mobile station location records in the MSE. The user can either set isCountQuery=true or false. If the isCountQuery=true, the user will only get the total count of MobileStation location records. In such a case, the numOfResults field will not be required. If isCountQuery=false, then the user will have to specify a value for the numOfResults field which should be in the limit of 1 to 100.

- All other queries (floorId, numOfResults, fromTimeMillis, toTimeMillis, startIndex)—The list of mobile station location records and their content, constrained based on the query content. If startIndex field is not set, it will return the first x (numOfResults value) results found in the MSE. The remaining fields are optional.

Result: See below.

Arguments: AesBusinessSession, AesMobileStationQueryArgs.

7.7.1 **SOAP Request**

```
<SOAP-ENV:Envelope  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<GetStationLocationListByArgs xmlns="http://cisco.com/mse/location"
xmlns:typ="http://cisco.com/mse/types">
    <typ:AesBusinessSession id="5760"/>
    <AesMobileStationQueryArgs fromTimeMillis="1086483888360"
toTimeMillis="1286544136425" isCountQuery="false" numOfResults="10">
       <sortCriteriaList>
         <typ: SortColumnCriteria isDescending="true" sortColumn="changedOn"/>
       </sortCriteriaList>
       <floorIdList>
         <floorId>11</floorId>
       </floorIdList>
    </AesMobileStationQueryArgs>
</GetStationLocationListByArgs>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.7.2 **SOAP Response**

7.7.2.1 Success

```
<SOAP-ENV:Envelope  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
 <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <loc:AesMobileStationLocation changedOn="1286541381516" confidenceFactor="144.0"
detectingControllers="1.2.3.72,1.2.3.75," firstActiveAt="1286541317313" floorId="39"
floorWeight="25" macAddress="00:16:44:b1:b4:96" minLastHeardSecs="12" networkStatus="1"
objectId="1584334" parentId="591" reason="0" sourceTimestamp="1286541381516" x="102.79"
y="174.12">
        <loc:info>
          <loc:AesMobileStation anchorAddress="0.0.0.0"
apMacAddress="00:19:a9:78:8f:40" changedOn="1286541381516" eapType="6"
encryptionCypher="3" ipAddress="0.0.0.0" macAddress="00:16:44:b1:b4:96"
objectId="1584334" parentId="591" policyManagerState="START" policyType="4"
portNumber="1" protocol="2" reasonCode="99" securityPolicyStatus="1"
sourceTimestamp="1286130195015" status="7" switchRef="loc-wlc-04" type="2"/>
        </loc:info>
    </loc:AesMobileStationLocation>
    <loc:AesMobileStationLocation changedOn="1286543521865" confidenceFactor="128.0"
detectingControllers="1.2.3.70" firstActiveAt="1286543485765" floorId="43"
floorWeight="46" macAddress="00:21:5c:0c:7c:6f" minLastHeardSecs="14" networkStatus="1"
objectId="1584377" parentId="510" reason="0" sourceTimestamp="1286543521865" x="284.39"
y="112.0">
        <loc:info>
          <loc:AesMobileStation anchorAddress="0.0.0.0"
apMacAddress="00:19:a9:78:8f:40" changedOn="1286543521865" eapType="6"
encryptionCypher="3" ipAddress="0.0.0.0" macAddress="00:21:5c:0c:7c:6f"
objectId="1584377" parentId="510" policyManagerState="START" policyType="4"
portNumber="1" protocol="2" reasonCode="99" securityPolicyStatus="1"
sourceTimestamp="1286510423786" status="7" switchRef="loc-wlc-04" type="2"/>
```

```
        </loc:info>
      </loc:AesMobileStationLocation>
    </Response>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.8 METHOD: GetGuestUserLocationListByMethodArgs

Queries the list of guest user AesMobileStationLocation location records currently stored in the MSE. The query can be:

- Count Query—Return the number of mobile station location records in the MSE. The user can either set isCountQuery=true or false. If the isCountQuery=true, the user will only get the total count of MobileStation location records. In such a case, the numOfResults field will not be required. If isCountQuery=false, then the user will have to specify a value for the numOfResults field which should be in the limit of 1 to 100.

- All other queries (floorId, numOfResults, fromTimeMillis, toTimeMillis, startIndex)—The list of mobile station location records and their content, constrained based on the query content. If startIndex field is not set, it will return the first x (numOfResults value) results found in the MSE. The remaining fields are optional.

Result: See below.

Arguments: AesBusinessSession, AesMobileStationQueryArgs.

7.8.1 SOAP Request

```
    <SOAP-ENV:Envelope  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
    <GetStationLocationListByArgs xmlns="http://cisco.com/mse/location"
xmlns:typ="http://cisco.com/mse/types">
      <typ:AesBusinessSession id="5760"/>
      <AesMobileStationQueryArgs fromTimeMillis="1086483888360"
toTimeMillis="1286544136425" isCountQuery="false" numOfResults="10">
        <sortCriteriaList>
          <typ:SortColumnCriteria isDescending="true" sortColumn="changedOn"/>
        </sortCriteriaList>
        <floorIdList>
          <floorId>11</floorId>
        </floorIdList>
      </AesMobileStationQueryArgs>
    </GetStationLocationListByArgs>
    </SOAP-ENV:Body>
    </SOAP-ENV:Envelope>
```

7.8.2 SOAP Response

7.8.2.1 Success

```
    <SOAP-ENV:Envelope  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
```

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```
        <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <loc:AesMobileStationLocation changedOn="1286541381516" confidenceFactor="144.0"
detectingControllers="1.2.3.72,1.2.3.75," firstActiveAt="1286541317313" floorId="39"
floorWeight="25" macAddress="00:16:44:b1:b4:96" minLastHeardSecs="12" networkStatus="1"
objectId="1584334" parentId="591" reason="0" sourceTimestamp="1286541381516" x="102.79"
y="174.12">
            <loc:info>
              <loc:AesMobileStation anchorAddress="0.0.0.0"
apMacAddress="00:19:a9:78:8f:40" changedOn="1286541381516" eapType="6"
encryptionCypher="3" ipAddress="0.0.0.0" macAddress="00:16:44:b1:b4:96"
objectId="1584334" parentId="591" policyManagerState="START" policyType="4"
portNumber="1" protocol="2" reasonCode="99" securityPolicyStatus="1"
sourceTimestamp="1286130195015" status="7" switchRef="loc-wlc-04" type="2"/>
            </loc:info>
          </loc:AesMobileStationLocation>
        </Response>
        </SOAP-ENV:Body>
        </SOAP-ENV:Envelope>
```

7.9 METHOD: GetStationHistory

Returns an AesMobileStationHistory history record currently stored in the MSE based on various search criteria. With v7.2 onwards, there is also support for partial IP Address search

Important note: For existing application(pre-v7.2) if there are both ip v4 and v6 addresses then the ipaddress attribute in the AesMobilestation object will contain the first ipv4 address and the other Ips will be sent in the EndpointIPAddress element. If there is no IP v4 address (there may or may not be IPv6 addresses) the ipAddress attribute will be empty. New Applications should rely only on the EndpointIPAddress element to get the ip address and not use the ipaddress attribute.

Result: An AesMobileStationHistory object or null if not found.

Arguments: AesBusinessSession, AesQueryCriteria

7.9.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<GetStationHistory xmlns=" http://cisco.com/mse/location">
        <AesBusinessSession id="10510"/>
        <AesQueryCriteria startIndex="2" numOfResults="3"/>
        <AesQueryCriteria isCountQuery="true">
        <and-list>
<AesMatchMbrCriteria matchClass="AesMobileStationHistory" matchMbr="macAddress"
matchValue="00:09:b7:13:aa:96" valueClass="java.lang.String"/>
        </and-list>
        </AesQueryCriteria>
</GetStationHistory>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.9.2 **SOAP Response**

7.9.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<Response xmlns=" http://cisco.com/mse/location">
```

```xml
 <AesMobileStationHistory macAddress="00:01:02:03:04:05" changedOn="122122111"
from="2322323" to="555555555">
        <infoList>
        <AesMobileStation ipAddress="12.1.1.1" macAddress="00:01:02:03:04:05"
username="fred" changedOn="2322323">
            <EndpointInterface macAddress="00:1c:58:cd:48:81" ipAddress="1.2.3.4"
username802Dot1x="Sameer">
                <EndpointIPAddress entity="WIRELESS CLIENT" ipAaddress="10.10.1.2"
version="IPv4"/>
                <EndpointIPAddress entity="WIRELESS CLIENT" ipAddress="fdda:5cc1:23:4::1f"
version="IPv6"/>
                <EndpointIPAddress entity="WIRELESS_CLIENT"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
            </EndpointInterface>
            <EndpointIPAddress  entity="ANCHOR_CONTROLLER" ipAddress="10.10.2.4"
version="IPv4"/>
            <EndpointIPAddress entity="ANCHOR_CONTROLLER"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
            <CCXServiceInfo serviceType="VOICE" serviceLevel="LEVEL_1"/>
            <CCXServiceInfo serviceType="LOCATION" serviceLevel="LEVEL_2"
serviceName="LS1:S60,LS2:S69"/>
        </AesMobileStation>
        <AesMobileStation ipAddress="12.1.1.5" macAddress="00:01:02:03:04:05"
username="fred" changedOn="232232344">
            <EndpointInterface macAddress="00:1c:58:cd:48:81" ipAddress="1.2.3.4"
username802Dot1x="Sameer">
                <EndpointIPAddress entity="WIRELESS CLIENT" ipAaddress="10.10.1.2"
version="IPv4"/>
                <EndpointIPAddress entity="WIRELESS_CLIENT" ipAddress="fdda:5cc1:23:4::1f"
version="IPv6"/>
                <EndpointIPAddress entity="WIRELESS_CLIENT"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
            </EndpointInterface>
            <EndpointIPAddress  entity="ANCHOR_CONTROLLER" ipAddress="10.10.2.4"
version="IPv4"/>
            <EndpointIPAddress entity="ANCHOR_CONTROLLER"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
            <CCXServiceInfo serviceType="VOICE" serviceLevel="LEVEL_1"/>
            <CCXServiceInfo serviceType="LOCATION" serviceLevel="LEVEL 2"
serviceName="LS1:S60,LS2:S69"/>
        </AesMobileStation>
        </infoList>
        <statsList>
        <AesBaseStats macAddress="00:01:02:03:04:05" packetsSent="12" bytesSent="1221111"
packetsRecv="1111" bytesRecv="1212204" policyErrors="0" snr="-12" changedOn="2322323"/>
        <AesBaseStats macAddress="00:01:02:03:04:05" packetsSent="12" bytesSent="1221111"
packetsRecv="1111" bytesRecv="1212204" policyErrors="0" snr="-12" changedOn="232232344"/>
        </statsList>
        <locationList>
        <AesMobileStationLocation macAddress="00:01:02:03:04:05" changedOn="2322323"
floorId="10" x="12.1" y="34.6" z="2"/>
        <AesMobileStationLocation macAddress="00:01:02:03:04:05" changedOn="232232344"
floorId="10" x="12.2" y="34.7" z="2"/>
        </locationList>
        </AesMobileStationHistory>
</Response>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

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7.10 METHOD: AddStationAssetInfo

Adds an Asset info with predefined station macAddress to the MSE. The exisiting Asset information is overwritten.

Result: An AesResult object specifies the success or failure of the operation.

Arguments: AesBusinessSession, asset object containing the information

7.10.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
   <SOAP-ENV:Body>
       <AddStationAssetInfo macAddress="00:40:96:b1:be:e3"
xmlns="http://cisco.com/mse/location" xmlns:typ="http://cisco.com/mse/types">
         <typ:AesBusinessSession id="5760"/>
         <asset assetCategory="Test Clients" assetGroup="Lab" assetName="Cisco T61P"/>
</AddStationAssetInfo>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.10.2 SOAP Response

7.10.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
  <SOAP-ENV:Body>
    <Response xmlns=" http://cisco.com/mse/location">
        <AesResult result="true" resultArg="162" resultArgClass="java.lang.Long"/>
    </Response>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.11 METHOD: GetStationHistoryListByArgs

Queries the list of AesMobileStationHistory history records currently stored in the MSE. The query can be:

- Count Query — Return the number of mobile station history records in the MSE. The user can either set isCountQuery=true or false. If the isCountQuery=true, the user will only get the total count of MobileStationHistory records. In such a case, the numOfResults field will not be required. If isCountQuery=false, then the user will have to specify a value for the numOfResults field which should be in the limit of 1 to 100.

- All other queries (floorId, macAddress, numOfResults, fromTimeMillis, toTimeMillis, startIndex) — The list of mobile station history records and their content, constrained based on the query content. If startIndex field is not set, it will return the first x (numOfResults value) results found in the MSE. The remaining fields are optional.

Result: See below.

Arguments: AesBusinessSession, AesHistoryQueryArgs.

7.11.1 **SOAP Request**

```
        <SOAP-ENV:Envelope  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
            <GetStationHistoryListByArgs>

        <AesBusinessSession clientIPAddress="10.77.144.120" groupId="1" id="30210"
lastAccessTime="1248700729287" mask="-1"
            startTime="1248700728501" userId="1"/>

        <AesHistoryQueryArgs macAddress="00:21:6a:17:2c:a4" floorId="4"
isCountQuery="false" numOfResults="1"/>

            </GetStationHistoryListByArgs>
        </SOAP-ENV:Body>
        </SOAP-ENV:Envelope>
```

7.11.2 **SOAP Response**

7.11.2.1 **Success**

```
        <SOAP-ENV:Envelope  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
         <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
          <AesMobileStationHistory macAddress="00:21:6a:17:2c:a4">
            <infoList>
        <AesMobileStation anchorAddress="" apMacAddress="" changedOn="1250717016736"
interfaceStr="" ipAddress="" macAddress="00:21:6a:17:2c:a4" objectId="930" parentId="90"
policyManagerState="" securityPolicyStatus="1" sourceTimestamp="1250109904290" ssId=""
status="7" username=""/>
            </infoList>

            <locationList>
        <AesMobileStationLocation changedOn="1250719727154" confidenceFactor="1433.6"
detectingControllers=",1.2.3.48,1.2.3.81" floorId="4" floorWeight="-2"
fullHierarchy="AesNetworkDesign:testB|AesGroup:testB_Group|AesBuilding:testB|AesFloor:tes
tF" macAddress="00:21:6a:17:2c:a4" minLastHeardSecs="6" networkStatus="2" objectId="1020"
parentId="90" simpleHierarchy="testB>testB>testF" sourceTimestamp="1250719727155"
x="264.57" y="175.05">
                    <info>
        <AesMobileStation anchorAddress="" apMacAddress="" changedOn="1250717016736"
interfaceStr="" ipAddress="" macAddress="00:21:6a:17:2c:a4" objectId="930" parentId="90"
policyManagerState="" securityPolicyStatus="1" sourceTimestamp="1250109904290" ssId=""
status="7" username=""/>
                    </info>
                </AesMobileStationLocation>
            </locationList>

         </AesMobileStationHistory>
         </Response>
        </SOAP-ENV:Body>
        </SOAP-ENV:Envelope>
```

7.11.3 **SOAP Request**

```
        <SOAP-ENV:Envelope  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
```

```
        <GetStationHistoryListByArgs>

     <AesBusinessSession id="19194"/>

      <AesHistoryQueryArgs isCountQuery="false" startIndex="8"
fromTimeMillis="1251243896940" toTimeMillis="1251331926551" numOfResults="2"/>

            </GetStationHistoryListByArgs>
        </SOAP-ENV:Body>
        </SOAP-ENV:Envelope>
```

7.11.4 **SOAP Response**

7.11.4.1 **Success**

```
        <SOAP-ENV:Envelope  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
         <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
          <AesMobileStationHistory macAddress="00:40:96:b1:be:e3">
           <statsList>
        <AesBaseStats bytesReceived="7393207" bytesSent="145400" changedOn="1251331866540"
macAddress="00:40:96:b1:be:e3" objectId="552" packetsReceived="80810" packetsSent="1398"
parentId="86" sourceTimestamp="1251331734230"/>
           </statsList>
           <infoList>
        <AesMobileStation aid="1" anchorAddress="0.0.0.0" apMacAddress="00:1c:f9:05:6c:50"
ccxVersion="5" changedOn="1251331866540" eapType="6" encryptionCypher="3" essIndex="1"
interfaceStr="management" ipAddress="60.60.1.52" macAddress="00:40:96:b1:be:e3"
mobilityStatus="1" objectId="4361" parentId="86" policyManagerState="RUN" policyType="4"
portNumber="1" protocol="3" reasonCode="99" shortPreambleOptionImplemented="1"
sourceTimestamp="1251330790815" ssId="gps_calib" status="3" switchRef="wlc-81"
username="" vlanId="6"/>
           </infoList>
           <locationList>
        <AesMobileStationLocation changedOn="1251331866540" confidenceFactor="310.4"
detectingControllers=",1.2.3.48,1.2.3.75" floorId="7" floorWeight="279"
fullHierarchy="AesNetworkDesign:testB|AesGroup:testB_Group|AesBuilding:testB|AesFloor:tes
tF" macAddress="00:40:96:b1:be:e3" minLastHeardSecs="4" networkStatus="2" objectId="4361"
parentId="86" simpleHierarchy="testB>testB>testF" sourceTimestamp="1251331866541"
x="190.25" y="152.99">
                <info>
        <AesMobileStation aid="1" anchorAddress="0.0.0.0" apMacAddress="00:1c:f9:04:90:30"
ccxVersion="5" changedOn="1250716286625" eapType="6" encryptionCypher="3" essIndex="1"
interfaceStr="management" ipAddress="40.40.1.154" macAddress="00:40:96:b1:be:e3"
mobilityStatus="1" objectId="904" parentId="86" policyManagerState="RUN" policyType="4"
portNumber="1" protocol="3" reasonCode="99" shortPreambleOptionImplemented="1"
sourceTimestamp="1250716063296" ssId="wlc-48" status="3" switchRef="wlc-48"
username="unknown" vlanId="4"/>
                </info>
             </AesMobileStationLocation>
   </locationList>
         </AesMobileStationHistory>

          <AesMobileStationHistory macAddress="00:22:fa:de:e3:d8">
           <infoList>
        <AesMobileStation anchorAddress="" apMacAddress="" changedOn="1251331926551"
interfaceStr="" ipAddress="" macAddress="00:22:fa:de:e3:d8" objectId="4362"
parentId="133" policyManagerState="" securityPolicyStatus="1"
sourceTimestamp="1251239511821" ssId="" status="7" username=""/>
           </infoList>
           <locationList>
        <AesMobileStationLocation areaSize="1" changedOn="1251331926551"
confidenceFactor="441.6" detectingControllers=",1.2.3.48,1.2.3.75" floorId="7"
floorWeight="54"
fullHierarchy="AesNetworkDesign:testB|AesGroup:testB_Group|AesBuilding:testB|AesFloor:tes
tF" macAddress="00:22:fa:de:e3:d8" minLastHeardSecs="7" networkStatus="2" objectId="4362"
```

```
parentId="133" simpleHierarchy="testB>testB>testF" sourceTimestamp="1251331926551"
x="175.9" y="99.23">
                <areaList area="aa"/>
                <info>
        <AesMobileStation anchorAddress="" apMacAddress="" changedOn="1251243965666"
interfaceStr="" ipAddress="" macAddress="00:22:fa:de:e3:d8" objectId="2354"
parentId="133" policyManagerState="" securityPolicyStatus="1"
sourceTimestamp="1251239511821" ssId="" status="7" username=""/>
                </info>
            </AesMobileStationLocation>
          </locationList>
        </AesMobileStationHistory>
      </Response>
      </SOAP-ENV:Body>
      </SOAP-ENV:Envelope>
```

7.12 METHOD: ModifyStation

Modifies the station information.

Result: An AesResult object specifying the success or failure of the operation.

Arguments: AesBusinessSession, AesMobileStation object containing measurements and so on.

Note: To modify or Add asset information, use the AddStationAssetInfo API.

7.12.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <ModifyStation xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesMobileStation macAddress="00:01:02:03:04:05">
                <asset name="fred23" group="grep1" category="people"/>
            </AesMobileStation>
        </ModifyStation>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.12.2 SOAP Response

7.12.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesResult result="true"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.13   METHOD: GetStationInfoListByArgs

Queries the list of AesMobileStation records from the MSE. The query can be:

- Search for Clients with CCX Location service type

- Search for Clients by IP address

- Search for Clients by Username

Important note: For existing application if there are both ip v4 and v6 addresses then the ipaddress attribute in the AesMobilestation object will contain the first ipv4 address and the other Ips will be sent in the EndpointIPAddress element. If there is no IP v4 address (there may or may not be IPv6 addresses) the ipAddress attribute will be empty. New Applications should rely only on the EndpointIPAddress element to get the ip address and not use the ipaddress attribute.

Result: See below.

Arguments: AesBusinessSession, StationInfoQueryArgs.

7.13.1   **SOAP Request**

```
Search for clients with CCX Location Service Type

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:loc="http://cisco.com/mse/location" xmlns:typ="http://cisco.com/mse/types">
   <soapenv:Header/>
   <soapenv:Body>
      <loc:GetStationInfoListByArgs>
         <loc:StationInfoQueryArgs isCountQuery="false" startIndex="0"
numOfResults="100"><loc:SortColumnCriteria sortColumn="ccxServiceInfos"
isDescending="false"/><loc:CCXServiceInfo serviceType="Location"
serviceLevel="LEVEL_2"/></loc:StationInfoQueryArgs>
         <typ:AesBusinessSession id="21464"/>
      </loc:GetStationInfoListByArgs>
   </soapenv:Body>
</soapenv:Envelope>

Search for client by IP Address

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:loc="http://cisco.com/mse/location" xmlns:typ="http://cisco.com/mse/types">
   <soapenv:Header/>
   <soapenv:Body>
      <loc:GetStationInfoListByArgs>
         <loc:StationInfoQueryArgs options="0"  isCountQuery="false" startIndex="0"
numOfResults="1000" ipAddress="193.1.0.1"><loc:SortColumnCriteria
sortColumn="AesMobileStation.ipAddress" isDescending="true"/></loc:StationInfoQueryArgs>
         <typ:AesBusinessSession id="27413"/>
      </loc:GetStationInfoListByArgs>
   </soapenv:Body>
</soapenv:Envelope>

Search for client by User Name

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:loc="http://cisco.com/mse/location" xmlns:typ="http://cisco.com/mse/types">
   <soapenv:Header/>
   <soapenv:Body>
      <loc:GetStationInfoListByArgs>
         <loc:StationInfoQueryArgs options="0"  isCountQuery="false" startIndex="0"
numOfResults="1000" ipAddress="193.1.0.%" userName="%Client%"><loc:SortColumnCriteria
sortColumn="ipAddress" isDescending="false"/></loc:StationInfoQueryArgs>
```

```
        <typ:AesBusinessSession id="27413"/>
      </loc:GetStationInfoListByArgs>
   </soapenv:Body>
</soapenv:Envelope>
```

7.13.2 **SOAP Response**

7.13.2.1 **Success**

```
      <SOAP-ENV:Envelope  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
      <SOAP-ENV:Body>
       <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
       <AesMobileStation aid="1" anchorAddress="0.0.0.0"
apMacAddress="00:1c:f9:04:90:30" ccxVersion="4" changedOn="1283485641809" eapType="6"
encryptionCypher="3" essIndex="1" interfaceStr="management" ipAddress="1.2.3.4"
macAddress="00:1c:58:cd:48:81" mobilityStatus="1" objectId="60" policyManagerState="RUN"
policyType="4" portNumber="1" protocol="3" reasonCode="1"
shortPreambleOptionImplemented="1" ssId="wlc-48" status="3" switchRef="wlc-48" type="2"
vlanId="4">
           <EndpointInterface macAddress="00:1c:58:cd:48:81" ipAddress="1.2.3.4"
username802Dot1x="Sameer">
             <EndpointIPAddress entity="WIRELESS_CLIENT" ipAaddress="10.10.1.2"
version="IPv4"/>
             <EndpointIPAddress entity="WIRELESS_CLIENT" ipAddress="fdda:5cc1:23:4::1f"
version="IPv6"/>
             <EndpointIPAddress entity="WIRELESS_CLIENT"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
           </EndpointInterface>
           <EndpointIPAddress  entity="ANCHOR_CONTROLLER" ipAddress="10.10.2.4"
version="IPv4"/>
           <EndpointIPAddress entity="ANCHOR_CONTROLLER"
ipAddress="2001:0db8:85a3:08d3:1319:8a2e:0370:7348" version="IPv6"/>
           <CCXServiceInfo serviceType="VOICE" serviceLevel="LEVEL 1"/>
           <CCXServiceInfo serviceType="LOCATION" serviceLevel="LEVEL_2"
serviceName="LS1:S60,LS2:S69"/>
  </AesMobileStation>
 </Response>
      </SOAP-ENV:Body>
      </SOAP-ENV:Envelope>
```

7.14 METHOD: GetStationHistoryListByInfoArgs

Queries the list of AesMobileStationHistory history records currently stored in the MSE. The query can be:

- Count Query — Return the number of mobile station history records in the MSE. The user can either set isCountQuery=true or false. If the isCountQuery=true, the user will only get the total count of MobileStationHistory records. In such a case, the numOfResults field will not be required. If isCountQuery=false, then the user will have to specify a value for the numOfResults field which should be in the limit of 1 to 100.

- All other queries (username, status, macAddress, numOfResults, fromTimeMillis, toTimeMillis, startIndex, CCXServiceInfo) — The list of mobile station history records and their content, constrained based on the query content. If startIndex field is not set, it will return the first x (numOfResults value) results found in the MSE. The remaining fields are optional. numOfResults is mandatory field for these queries.

Result: See below.

Arguments: AesBusinessSession, AesHistoryQueryInfoArgs.

7.14.1 **SOAP Request**

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <GetStationHistoryListByInfoArgs xmlns="http://cisco.com/mse/types">
     <AesBusinessSession id="12156" mask="-1"/>
        <AesHistoryQueryInfoArgs isCountQuery="true"
macAddress="00:24:d7:83:db:40" numOfResults="50" status="3"/>
    </GetStationHistoryListByInfoArgs>
  </SOAP-ENV:Body>
```

7.14.2 **SOAP Response**

7.14.2.1 **Success**

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
  <Response xmlns="http://cisco.com/mse/types">
  <AesMobileStationHistory macAddress="00:24:d7:83:db:40">
       <statsList>
            <AesBaseStats         bytesReceived="13145919"        bytesSent="361250"
changedOn="1329346169954"        macAddress="00:24:d7:83:db:40"        objectId="73"
packetsReceived="301146"              packetsSent="4603"              parentId="64"
sourceTimestamp="1329345938025"/>
            <AesBaseStats         bytesReceived="13145919"        bytesSent="361250"
changedOn="1329346168312"        macAddress="00:24:d7:83:db:40"        objectId="71"
packetsReceived="301146"              packetsSent="4603"              parentId="64"
sourceTimestamp="1329345938025"/>
       </statsList>
       <infoList>
            <AesMobileStation   aid="1"   anchorAddress="0.0.0.0"   apIfSlotId="1"
apMacAddress="00:1c:b1:88:fb:30"  ccxVersion="4"  changedOn="1329349120405"  eapType="6"
encryptionCypher="3"     essIndex="3"     interfaceStr="management"     ipAddress="0.0.0.0"
macAddress="00:24:d7:83:db:40"     mobilityStatus="1"     objectId="6667"     parentId="64"
policyManagerState="DHCP_REQD"  policyType="4"  portNumber="1"  protocol="1"  reasonCode="1"
sourceTimestamp="1329348990000"  ssId="wlan-72-calib"  status="3"  switchRef="loc-wlc-04"
type="2"   vlanId="2"><EndpointIPAddress   entity="WIRELESS_CLIENT"   ipAddress="0.0.0.0"
version="IPv4"/><AnchorAddressList><EndpointIPAddress          entity="ANCHOR_CONTROLLER"
ipAddress="0.0.0.0" version="IPv4"/></AnchorAddressList></AesMobileStation>
            <AesMobileStation   aid="1"   anchorAddress="0.0.0.0"   apIfSlotId="1"
apMacAddress="00:1c:b1:88:fb:30"  ccxVersion="4"  changedOn="1329344839749"  eapType="6"
encryptionCypher="3"     essIndex="3"     interfaceStr="management"     ipAddress="0.0.0.0"
macAddress="00:24:d7:83:db:40"     mobilityStatus="1"     objectId="704"     parentId="64"
policyManagerState="DHCP_REQD" policyType="4" portNumber="1" protocol="1" reasonCode="1"
sourceTimestamp="1329344778217"  ssId="wlan-72-calib"  status="3"  switchRef="loc-wlc-04"
type="2"   vlanId="2"><EndpointIPAddress   entity="WIRELESS CLIENT"   ipAddress="0.0.0.0"
version="IPv4"/><AnchorAddressList><EndpointIPAddress          entity="ANCHOR_CONTROLLER"
ipAddress="0.0.0.0" version="IPv4"/></AnchorAddressList></AesMobileStation>
       </infoList>
       <locationList>
            <AesMobileStationLocation                      changedOn="1329344908750"
confidenceFactor="48.0"            detectingControllers="1.1.1.38,1.1.1.70,1.1.1.72,"
firstActiveAt="1329344202823"      floorAesUID="-6104764483291315796"      floorId="2"
floorWeight="395"                           fullHierarchy="AesNetworkDesign:System
Campus|AesBuilding:bldg|AesFloor:flr1"              macAddress="00:24:d7:83:db:40"
```

```
minLastHeardSecs="4"    networkStatus="2"    objectId="808"    parentId="64"    reason="13"
simpleHierarchy="System    Campus>bldg>flr1"    sourceTimestamp="1329344908754"    x="205.08"
y="137.43">
                        <info>
                            <AesMobileStation                            changedOn="1329344209649"
macAddress="00:24:d7:83:db:40"                objectId="82"                    parentId="64"
sourceTimestamp="1329344202824" status="7" type="2"/>
                        </info>
                    </AesMobileStationLocation>
                    <AesMobileStationLocation                        changedOn="1329344839749"
confidenceFactor="112.0"          detectingControllers="1.1.1.38,1.1.1.70,1.1.1.72,"
firstActiveAt="1329344202823"        floorAesUId="-6104764483291315796"        floorId="2"
floorWeight="603"                           fullHierarchy="AesNetworkDesign:System
Campus|AesBuilding:bldg|AesFloor:flr1"                macAddress="00:24:d7:83:db:40"
minLastHeardSecs="9"    networkStatus="2"    objectId="704"    parentId="64"    reason="1"
simpleHierarchy="System    Campus>bldg>flr1"    sourceTimestamp="1329344839755"    x="276.67"
y="146.06">
                        <info>
                            <AesMobileStation                            changedOn="1329344209649"
macAddress="00:24:d7:83:db:40"                objectId="82"                    parentId="64"
sourceTimestamp="1329344202824" status="7" type="2"/>
                        </info>
                    </AesMobileStationLocation>
                </locationList>
            </AesMobileStationHistory>
            </Response>
        </SOAP-ENV:Body>
```

7.15 METHOD: GetStationLocationByIpAddress

Returns an AesMobileStationLocation location record currently stored in the MSE based on the IP address.

Result: An AesMobileStationLocation object or null if not found.

Arguments: AesBusinessSession, IP Address Key

7.15.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetStationLocationByIpAddress IpAddress="10.10.1.1">
                <AesBusinessSession id="2920"/>
        </GetStationLocationByIpAddress>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.15.2 SOAP Response

7.15.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
```

```
        <Response xmlns=" http://cisco.com/mse/location">
            <AesMobileStationLocation                macAddress="00:01:02:03:04:05"
changedOn="122122111" ipAddress="10.10.1.1" floorId="10" x="12.1" y="34.6" z="2"/>
            </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

CHAPTER 8

8 Location – Tag

The tag interface concentrates on the following areas for 802.11 tags:

- Calculation of real-time location

- Calculation of statistics

- Historical collection of Location and Statistics

8.1 METHOD: GetTagInfoList

Queries the list of tags currently stored in the MSE. The query can be:

- NULL -Return all tags and their contents.

- Count Query -Return the number of tags in the server

- All other queries (sorting, paging, member match and so on) - The list of tags and their content, constrained based on the query content.

Result: See below.

Arguments: AesBusinessSession, AesQueryCriteria

8.1.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<GetTagInfoList xmlns="http://cisco.com/mse/location"
                                xmlns:typ="http://cisco.com/mse/types">
    <typ:AesBusinessSession id="18418"/>
    <typ:AesQueryCriteria startIndex="2" numOfResults="3"/>
```

```
</GetTagInfoList>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.1.2 **SOAP Response**

8.1.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <AesTag batteryStatus="2" changedOn="1302692022316" lastBeaconSeqNum="1473"
         lastBeaconTime="0" macAddress="00:0c:cc:74:04:21" objectId="183">
          <batteryInfo>
            <AesBatteryInfo lastReceivedSeqNum="1473" lastReceivedTime="1302692016836"
            percentRemaining="80" tolerance="20"/>
          </batteryInfo>
          <vendorData>
            <AesVendorData changedOn="1302692022316" data="0,0,0,0,"
            lastReceivedSeqNum="1473" lastReceivedTime="1302692016836"
           objectId="236621" parentId="183" vendorId="3276"/>
          </vendorData>
        </AesTag>
        <AesTag batteryStatus="2" changedOn="1302685916517" lastBeaconSeqNum="4019"
         lastBeaconTime="0" macAddress="00:0c:cc:7a:de:c3" objectId="186">
          <batteryInfo>
            <AesBatteryInfo lastReceivedSeqNum="4019" lastReceivedTime="1302684801262"
            percentRemaining="80" tolerance="20"/>
          </batteryInfo>
          <vendorData>
            <AesVendorData changedOn="1302685916518" data="0,0,0,0,"
             lastReceivedSeqNum="4019" lastReceivedTime="1302684801262"
             objectId="235886" parentId="186" vendorId="3276"/>
          </vendorData>
        </AesTag>
        <AesTag batteryStatus="2" changedOn="1302680997978" lastBeaconSeqNum="2662"
         lastBeaconTime="0" macAddress="00:0c:cc:7a:e3:9f" objectId="187">
          <batteryInfo>
            <AesBatteryInfo lastReceivedSeqNum="2662" lastReceivedTime="1302680993505"
            percentRemaining="80" tolerance="20"/>
          </batteryInfo>
          <vendorData>
            <AesVendorData changedOn="1302680997979" data="0,0,0,0,"
             lastReceivedSeqNum="2662" lastReceivedTime="1302680993505"
             objectId="234758" parentId="187" vendorId="3276"/>
          </vendorData>
        </AesTag>
</Response>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.2 METHOD: GetTagInfo

Returns a tag currently stored in the MSE based on various search criteria.

Result: AesTag object or null if not found.

Arguments: AesBusinessSession, AesTag Key

8.2.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
```

```
    <SOAP-ENV:Body>
        <GetTagInfo xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesTag macAddress="00:01:02:03:04:05"/>
        </GetTagInfo>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.2.2 **SOAP Response**

8.2.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesTag macAddress="00:01:02:03:04:05" objectId="1">
                <asset name="gred"/>
            </AesTag>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.3 METHOD: GetTagStats

Returns an AesTag statistics record currently stored in the MSE based on various search criteria.

Result: AesBaseStats object or null if not found.

Arguments: AesBusinessSession, AesMobileStation Key

8.3.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetTagStats xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesTag macAddress="00:01:02:03:04:05"/>
        </GetTagStats>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.3.2 **SOAP Response**

8.3.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesBaseStats        macAddress="00:01:02:03:04:05"        packetsSent="12"
bytesSent="1221111"  packetsRecv="1111"  bytesRecv="1212204"  policyErrors="0"  snr="-12"
changedOn="1220324324"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.4 METHOD: GetTagStatsList

Queries the list of tag statistics record currently stored in the MSE. The query can be:

- NULL - Return all tag statistics and their contents.

- Count Query - Return the number of tag statistics in the server

- All other queries (sorting, paging, member match and so on) - The list of tag statistics and their content, constrained based on the query content.

Result: See below.

Arguments: AesBusinessSession, AesQueryCriteria

8.4.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
   <GetTagStatsList xmlns="http://cisco.com/mse/location"
                                 xmlns:typ="http://cisco.com/mse/types">
        <typ:AesBusinessSession id="17187"/>
        <typ:AesQueryCriteria startIndex="2" numOfResults="3"/>
   </GetTagStatsList>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.4.2 SOAP Response

8.4.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
        <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
          <AesBaseStats bytesReceived="11813006899937280" changedOn="1302696151650"
macAddress="00:06:66:13:ee:4a" objectId="14061" packetsReceived="231627586273280"
type="1"/>
          <AesBaseStats bytesReceived="256068179275546624" changedOn="1302696151650"
macAddress="00:0c:cc:5c:05:16" objectId="14062" packetsReceived="3673644442058752"
type="1"/>
          <AesBaseStats bytesReceived="28692833963606016" changedOn="1302696151651"
macAddress="00:0c:cc:73:15:45" objectId="14063" packetsReceived="503383051993088"
type="1"/>
        </Response>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.5 METHOD: GetTagLocation

Returns an AesTagLocation location record currently stored in the MSE.

Result: An AesTagLocation object or null if not found.It displays the time when it encounters the chokepoint in "chokepointerEncounterTime" attribute and also the last chokepoint's mac address it encountered in "lastChokepointMac".

Note: If the tag's location is based on chokepoint, then the attribute "locationContributorMask" value =1, if it's based on RSSI then the value =2. If telemetry values are present for a tag, telemetry values are also listed in the AesTelemetry object.

Arguments: AesBusinessSession, AesTag Key

8.5.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetTagLocation xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesTag macAddress="00:0c:cc:5c:87:34"/>
        </GetTagLocation>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.5.2 **SOAP Response**

8.5.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesTagLocation calcFloorId="1" calcX="278.11" calcY="21.02"
            changedOn="1188497681772"
            chokepointEncounterTime="0"confidenceFactor="144.0" floorId="1"
            fullHierarchy="AesNetworkDesign:WNBU|AesGroup:WNBU_Group|AesBuilding:WNBU|
            AesFloor:Lab" locationContributorMask="2" macAddress="00:0c:cc:5c:05:16"
            minLastHeardSecs="13" objectId="6" simpleHierarchy="WNBU&gt;WNBU&gt;Lab"
            sourceTimestamp="1188496693385" x="278.11" y="21.02">

            <info><AesTag batteryStatus="2" changedOn="1188496684347"
            lastBeaconTime="0" macAddress="00:0c:cc:5c:05:16" objectId="6"
            propertiesMask="-2">

                <batteryInfo>
            <AesBatteryInfolastReceivedTime="1188496678535"     percentRemaining="80"
            tolerance="20"/>
            </batteryInfo>
            <vendorData>

             <AesVendorData changedOn="1188496684347" data="110,19,- 93,0,0,"
lastReceivedTime="1188495886545" objectId="46" parentId="6" vendorId="3276"/>
            </vendorData>
      <telemetryList>
            <AesTelemetry changedOn="1188496684347" lastReceivedTi
            me="1188496678535"
measurementClass="com.aes.datamodel.location.ctx.AesDefaultTelemMeasurement"
objectId="57" parentId="6" type="MOTIONPROB">
            <AesDefaultTelemMeasur
            ement/> </AesTelemetry>
      </telemetryList>
      <chokepointEncounterList>
```

```
              <AesChokepointEncounter changedOn="1188496684347"
chokepointMac="00:0c:cc:60:13:a3" index="0" isActive="false" isPerimeter="NON_PERIMETER"
objectId="46" parentId="6" timestamp="1188495886545"/>
        </chokepointEncounterList>
</AesTag>
</info>
</AesTagLocation>


    </Response>
   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.6 METHOD: GetTagLocationListByArgs

Queries the list of AesTagLocation location records currently stored in the MSE. The query can be:

- Count Query—Return the number of mobile station location records in the MSE. The user can either set isCountQuery=true or false. If the isCountQuery=true, the user will only get the total count of MobileStation location records. In such a case, the numOfResults field will not be required. If isCountQuery=false, then the user will have to specify a value for the numOfResults field which should be in the limit of 1 to 100.

- All other queries (floorId, numOfResults, fromTimeMillis, toTimeMillis, startIndex)—The list of mobile station location records and their content, constrained based on the query content. If startIndex field is not set, it will return the first x (numOfResults value) results found in the MSE. The remaining fields are optional.

Result: See below.

Arguments: AesBusinessSession, AesTagQueryArgs.

8.6.1 SOAP Request

```
      <SOAP-ENV:Envelope  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
      <SOAP-ENV:Body>
      <GetTagLocationListByArgs xmlns="http://cisco.com/mse/location"
xmlns:typ="http://cisco.com/mse/types">
         <typ:AesBusinessSession id="5760"/>
         <AesTagQueryArgs fromTimeMillis="1086483888360" toTimeMillis="1286544136425"
isCountQuery="false" numOfResults="10">
          <sortCriteriaList>
            <typ: SortColumnCriteria isDescending="true" sortColumn="changedOn"/>
          </sortCriteriaList>
          <floorIdList>
            <floorId>11</floorId>
          </floorIdList>
         </AesTagQueryArgs>
      </GetTagLocationListByArgs>
      </SOAP-ENV:Body>
      </SOAP-ENV:Envelope>
```

8.6.2 **SOAP Response**

8.6.2.1 Success

```
<SOAP-ENV:Envelope    xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
          <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <loc:AesTagLocation calcFloorAesUId="-6047451310117093357" calcFloorId="39"
calcX="182.87" calcY="213.55" changedOn="1286541381519" chokepointEncounterTime="0"
confidenceFactor="344.0" detectingControllers="1.2.3.70" firstActiveAt="1286540510060"
floorId="39" floorWeight="3" locationContributorMask="2" macAddress="00:04:f1:02:2a:e0"
minLastHeardSecs="12" networkStatus="1" objectId="121197" parentId="6" reason="0"
sourceTimestamp="1286541381519" x="182.87" y="213.55">

    <loc:info>

      <loc:AesTag batteryStatus="2" changedOn="1286541381519" lastBeaconSeqNum="2089"
lastBeaconTime="0" macAddress="00:04:f1:02:2a:e0" objectId="121197" parentId="6"
sourceTimestamp="1286540497896">

        <loc:batteryInfo>

          <loc:AesBatteryInfo batteryAge="106" daysRemaining="1720"
lastReceivedSeqNum="2089" lastReceivedTime="1286540496370" percentRemaining="90"
tolerance="20"/>

        </loc:batteryInfo>

      </loc:AesTag>

    </loc:info>

  </loc:AesTagLocation>

  <loc:AesTagLocation calcFloorAesUId="-6047451310117093357" calcFloorId="39"
calcX="118.29" calcY="154.21" changedOn="1286541381519" chokepointEncounterTime="0"
confidenceFactor="80.0" detectingControllers="1.2.3.70,1.2.3.72,1.2.3.75,"
firstActiveAt="1286540036177" floorId="39" floorWeight="62" locationContributorMask="2"
macAddress="00:0c:cc:5c:05:16" minLastHeardSecs="15" networkStatus="1" objectId="121195"
parentId="1" reason="0" sourceTimestamp="1286541381519" x="118.29" y="154.21">

    <loc:info>

      <loc:AesTag batteryStatus="2" changedOn="1286541381519" lastBeaconSeqNum="3275"
lastBeaconTime="0" macAddress="00:0c:cc:5c:05:16" objectId="121195" parentId="1"
propertiesMask="-2" sourceTimestamp="1286541365013">

        <loc:batteryInfo>

          <loc:AesBatteryInfo lastReceivedSeqNum="3275" lastReceivedTime="1286541358748"
percentRemaining="80" tolerance="20"/>

        </loc:batteryInfo>

      </loc:AesTag>
```

```
        </loc:info>

   </loc:AesTagLocation>

       </Response>
       </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.7 METHOD: GetTagLocationList

Queries the list of AesTagLocation records currently stored in the MSE.

Note: *If the tag's location is based on chokepoint, then the attribute "locationContributorMask" value =1, if it's based on RSSI then the value =2. . If telemetry values are present for a tag, telemetry values are also listed in the AesTelemetry object.*

The query can be:

- NULL - Return all tag locations and their contents.

- Count Query - Return the number of tag locations in the server.

- All other queries (sorting, paging, member match and so on) - The list of tag locations and their content, constrained based on the query content.

Result: See below.

Arguments: AesBusinessSession, AesQueryCriteria

8.7.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<GetTagLocationList xmlns="http://cisco.com/mse/location"
xmlns:typ="http://cisco.com/mse/types">
   <typ:AesBusinessSession id="25481"/>
   <typ:AesQueryCriteria startIndex="2" numOfResults="3"/>
</GetTagLocationList>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.7.2 SOAP Response

8.7.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
  <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
                          ENV="http://schemas.xmlsoap.org/soap/envelope/">
   <AesTagLocation calcFloorAesUId="-6104764736694386568" calcFloorId="4133"
calcX="127.48" calcY="171.05" changedOn="1302695991085" chokepointEncounterTime="0"
confidenceFactor="144.0" detectingControllers="1.2.3.70" firstActiveAt="1302695718781"
floorAesUId="-6104764736694386568" floorId="4133" floorWeight="44"
locationContributorMask="2" macAddress="00:04:f1:02:2a:ea" minLastHeardSecs="13"
networkStatus="1" objectId="160" reason="0" sourceTimestamp="1302695991085" x="127.48"
y="171.05">
            <info>
```

```
                    <AesTag batteryStatus="2" changedOn="1302695947111" lastBeaconSeqNum="3008"
lastBeaconTime="0" macAddress="00:04:f1:02:2a:ea" objectId="163" parentId="160">
                        <batteryInfo>
                            <AesBatteryInfo batteryAge="293" daysRemaining="1533"
lastReceivedSeqNum="3008" lastReceivedTime="1302695943929" percentRemaining="80"
tolerance="20"/>
                        </batteryInfo>
                    </AesTag>
                </info>
            </AesTagLocation>
            <AesTagLocation calcFloorAesUId="-6104764736694386568" calcFloorId="4126"
calcX="134.55" calcY="139.27" changedOn="1302693935341" chokepointEncounterTime="0"
confidenceFactor="208.0" detectingControllers="1.2.3.70" firstActiveAt="1302692235246"
floorAesUId="-6104764736694386568" floorId="4126" floorWeight="38"
fullHierarchy="AesNetworkDesign:System Campus|AesBuilding:sjc-14|AesFloor:lab"
locationContributorMask="2" macAddress="00:0c:cc:7a:f0:fa" minLastHeardSecs="11"
networkStatus="1" objectId="161" reason="0" simpleHierarchy="System Campus>sjc-14>lab"
size="4" sourceTimestamp="1302693935341" x="134.55" y="139.27">
                <floorHierarchy elem="lab"/>
                <floorHierarchy elem="sjc-14"/>
                <floorHierarchy elem="System Campus"/>
                <floorHierarchy elem=""/>
                <info>
                    <AesTag batteryStatus="2" changedOn="1302693418892" lastBeaconSeqNum="3203"
lastBeaconTime="0" macAddress="00:0c:cc:7a:f0:fa" objectId="170">
                        <batteryInfo>
                            <AesBatteryInfo lastReceivedSeqNum="3203"
lastReceivedTime="1302693417737" percentRemaining="80" tolerance="20"/>
                        </batteryInfo>
                        <vendorData>
                            <AesVendorData changedOn="1302693418892" data="0,0,0,0,"
lastReceivedSeqNum="3203" lastReceivedTime="1302693417737" objectId="236756"
parentId="170" vendorId="3276"/>
                        </vendorData>
                    </AesTag>
                </info>
            </AesTagLocation>
            <AesTagLocation calcFloorAesUId="-6104764736694386570" calcFloorId="4135"
calcX="144.0" calcY="64.0" changedOn="1302695989753" chokepointEncounterTime="0"
confidenceFactor="360.0" detectingControllers="1.2.3.72" firstActiveAt="1302695841276"
floorAesUId="-6104764736694386570" floorId="4135" floorWeight="18"
locationContributorMask="2" macAddress="00:06:66:13:ee:4a" minLastHeardSecs="13"
networkStatus="1" objectId="162" reason="0" sourceTimestamp="1302695989753" x="144.0"
y="64.0">
                <info>
                    <AesTag batteryStatus="2" changedOn="1302695916115" lastBeaconSeqNum="1483"
lastBeaconTime="0" macAddress="00:06:66:13:ee:4a" objectId="164">
                        <batteryInfo>
                            <AesBatteryInfo batteryAge="40" daysRemaining="1055"
lastReceivedSeqNum="1483" lastReceivedTime="1302695913732" percentRemaining="90"
tolerance="30"/>
                        </batteryInfo>
                        <telemetryList>
                            <AesTelemetry changedOn="1302695916115" lastReceivedSeqNum="1483"
lastReceivedTime="1302695913732"
measurementClass="com.aes.datamodel.location.ctx.AesDefaultTelemMeasurement"
objectId="239661" parentId="164" type="TEMPERATURE" units="degrees Celsius">
                                <AesDefaultTelemMeasurement measurementClass="java.lang.Float"
measurementObj="25.0"/>
                                <objectId mask="25.0" parentId="java.lang.Float"/>
                            </AesTelemetry>
                        </telemetryList>
                    </AesTag>
                </info>
            </AesTagLocation>
```

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```
      </Response>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.8 METHOD: GetTagHistory

Returns an AesTagHistory history record currently stored in the MSE based on various search criteria.

Result: An AesTagHistory object or null if not found.

Arguments: AesBusinessSession, AesQuerycriteria

8.8.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
        <GetTagHistory xmlns="http://cisco.com/mse/location"
                                        xmlns:typ="http://cisco.com/mse/types">
          <typ:AesBusinessSession id="28597"/>
          <typ:AesQueryCriteria startIndex="2" numOfResults="3">
            <typ:and-list>
              <typ:AesMatchMbrCriteria matchClass="AesTag" matchMbr="macAddress"
matchValue="00:0c:cc:7a:f0:99" valueClass="java.lang.String" _operator="0"/>
            </typ:and-list>
          </typ:AesQueryCriteria>
        </GetTagHistory>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.8.2 SOAP Response

8.8.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
        <Response xmlns="http://cisco.com/mse/location"
           xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
          <AesTagHistory changedOn="1302692900604" from="1299725053944"
           macAddress="00:0c:cc:7a:f0:99" objectId="17" to="1302692900601">
            <statsList>
              <AesBaseStats bytesReceived="734439407616" changedOn="1302439782376"
               macAddress="00:0c:cc:7a:f0:99" objectId="407617"
               packetsReceived="12884901888" parentId="17"
               sourceTimestamp="1302439548802" type="1"/>
              <AesBaseStats bytesReceived="1224065679360" changedOn="1302440992558"
               macAddress="00:0c:cc:7a:f0:99" objectId="407658"
               packetsReceived="21474836480" parentId="17"
               sourceTimestamp="1302440749484" type="1"/>
              <AesBaseStats bytesReceived="244813135872" changedOn="1302442922882"
               macAddress="00:0c:cc:7a:f0:99" objectId="410703"
               packetsReceived="4294967296" parentId="17" sourceTimestamp="1302442852209"
               type="1"/>
            </statsList>
            <infoList>
              <AesTag batteryStatus="2" changedOn="1299753385627" lastBeaconSeqNum="2783"
               lastBeaconTime="0" macAddress="00:0c:cc:7a:f0:99" objectId="3998"
               parentId="17" sourceTimestamp="1299749724634">
                <batteryInfo>
                  <AesBatteryInfo lastReceivedSeqNum="2783"
                   lastReceivedTime="1299749722578" percentRemaining="80" tolerance="20"/>
                </batteryInfo>
                <vendorData>
```

```xml
        <AesVendorData changedOn="1299749724634" data="0,0,0,0,"
          lastReceivedSeqNum="2783" lastReceivedTime="1299749722578"
          objectId="1461" parentId="3998" vendorId="3276"/>
      </vendorData>
    </AesTag>
    <AesTag batteryStatus="2" changedOn="1299749725075" lastBeaconSeqNum="2783"
     lastBeaconTime="0" macAddress="00:0c:cc:7a:f0:99" objectId="3665"
     parentId="17" sourceTimestamp="1299749724634">
      <batteryInfo>
        <AesBatteryInfo lastReceivedSeqNum="2783"
          lastReceivedTime="1299749722578" percentRemaining="80"
          tolerance="20"/>
      </batteryInfo>
      <vendorData>
        <AesVendorData changedOn="1299749724634" data="0,0,0,0,"
          lastReceivedSeqNum="2783" lastReceivedTime="1299749722578"
          objectId="1336" parentId="3665" vendorId="3276"/>
      </vendorData>
    </AesTag>
    <AesTag batteryStatus="2" changedOn="1299770658274" lastBeaconSeqNum="2889"
     lastBeaconTime="0" macAddress="00:0c:cc:7a:f0:99" objectId="5556"
     parentId="17" sourceTimestamp="1299770657362">
      <batteryInfo>
        <AesBatteryInfo lastReceivedSeqNum="2889"
         lastReceivedTime="1299770652891" percentRemaining="80" tolerance="20"/>
      </batteryInfo>
      <vendorData>
        <AesVendorData changedOn="1299770657363" data="0,0,0,0,"
         lastReceivedSeqNum="2889" lastReceivedTime="1299770652891"
         objectId="1988" parentId="5556" vendorId="3276"/>
      </vendorData>
    </AesTag>
  </infoList>
  <locationList>
    <AesTagLocation calcFloorAesUId="-6047451310117093371" calcFloorId="1"
    calcX="110.33" calcY="33.86" changedOn="1299749725075"
    chokepointEncounterTime="0" detectingControllers="172.19.26.216"
    floorAesUId="-6047451310117093371" floorId="1"
    fullHierarchy="AesNetworkDesign:System
    Campus|AesBuilding:wnbu|AesFloor:lab" locationContributorMask="2" |
     macAddress="00:0c:cc:7a:f0:99" networkStatus="2" objectId="3665"
     parentId="17" reason="9" simpleHierarchy="System Campus>wnbu>lab"
     sourceTimestamp="1299749725077" x="110.33" y="33.86">
      <info>
        <AesTag batteryStatus="2" changedOn="1299725061287"
        lastBeaconSeqNum="2658" lastBeaconTime="0" macAddress="00:0c:cc:7a:f0:99"
        objectId="1483" parentId="17" sourceTimestamp="1299725053960">
          <batteryInfo>
            <AesBatteryInfo lastReceivedSeqNum="2658"
        lastReceivedTime="1299725051941" percentRemaining="80" tolerance="20"/>
          </batteryInfo>
          <vendorData>
            <AesVendorData changedOn="1299725053960" data="0,0,0,0,"
        lastReceivedSeqNum="2658" lastReceivedTime="1299725051941"
        objectId="577" parentId="1483" vendorId="3276"/>
          </vendorData>
        </AesTag>
      </info>
    </AesTagLocation>
    <AesTagLocation calcFloorAesUId="-6047451310117093371" calcFloorId="1"
    calcX="110.33" calcY="33.86" changedOn="1299753385627"
    chokepointEncounterTime="0" detectingControllers="172.19.26.216"
    floorAesUId="-6047451310117093371" floorId="1"
     fullHierarchy="AesNetworkDesign:System
     Campus|AesBuilding:wnbu|AesFloor:lab" locationContributorMask="2"
```

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```
                   macAddress="00:0c:cc:7a:f0:99" networkStatus="1" objectId="3998"
                   parentId="17" reason="15" simpleHierarchy="System Campus>wnbu>lab"
                   sourceTimestamp="1299753380725" x="110.33" y="33.86">
                    <info>
                      <AesTag batteryStatus="2" changedOn="1299725061287"
                       lastBeaconSeqNum="2658" lastBeaconTime="0"
                        macAddress="00:0c:cc:7a:f0:99" objectId="1483" parentId="17"
                       sourceTimestamp="1299725053960">
                       <batteryInfo>
                          <AesBatteryInfo lastReceivedSeqNum="2658"
                       lastReceivedTime="1299725051941" percentRemaining="80"
                       tolerance="20"/>
                       </batteryInfo>
                       <vendorData>
                         <AesVendorData changedOn="1299725053960" data="0,0,0,0,"
                        lastReceivedSeqNum="2658" lastReceivedTime="1299725051941"
                         objectId="577" parentId="1483" vendorId="3276"/>
                       </vendorData>
                      </AesTag>
                    </info>
                  </AesTagLocation>
                  <AesTagLocation calcFloorAesUId="-6047451310117093371" calcFloorId="1"
                   calcX="110.33" calcY="33.86" changedOn="1299770658274"
                   chokepointEncounterTime="0" detectingControllers="1.2.3.75"
                   floorAesUId="-6047451310117093371" floorId="1"
                   fullHierarchy="AesNetworkDesign:System
                   Campus|AesBuilding:wnbu|AesFloor:lab" locationContributorMask="2"
                   macAddress="00:0c:cc:7a:f0:99" networkStatus="2" objectId="5556"
                   parentId="17" reason="9" simpleHierarchy="System Campus>wnbu>lab"
                   sourceTimestamp="1299770658277" x="110.33" y="33.86">
                    <info>
                <AesTag batteryStatus="2" changedOn="1299725061287" lastBeaconSeqNum="2658"
                    lastBeaconTime="0" macAddress="00:0c:cc:7a:f0:99" objectId="1483"
                    parentId="17" sourceTimestamp="1299725053960">
                        <batteryInfo>
                          <AesBatteryInfo lastReceivedSeqNum="2658"
lastReceivedTime="1299725051941" percentRemaining="80" tolerance="20"/>
                        </batteryInfo>
                        <vendorData>
                <AesVendorData changedOn="1299725053960" data="0,0,0,0,"
                 lastReceivedSeqNum="2658" lastReceivedTime="1299725051941" objectId="577"
                 parentId="1483" vendorId="3276"/>
                        </vendorData>
                      </AesTag>
                    </info>
                  </AesTagLocation>
                </locationList>
              </AesTagHistory>
            </Response>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.9 METHOD: GetTagHistoryListByArgs

Queries the list of AesTagHistory history records currently stored in the MSE. The query can be:

- Count Query - Return the number of tag history records in the MSE. The user can set either isCountQuery=true or false. If the isCountQuery=true, the user will only get the total count of AesTagHistory records. In such a case, the numOfResults field will not be required. If the isCountQuery=false, then the user will have to specify a value for the numOfResults field which should be in between 1 to 100.

- All other queries (floorId, macAddress, numOfResults, fromTimeMillis, toTimeMillis, startIndex) - The list of tag history records and their content, constrained based on the query content. If startIndex field is not set, it will return the first x (numOfResults value) results found in the MSE. The remaining fields are optional.

Result: See below.

Arguments: AesBusinessSession, AesHistoryQueryArgs

8.9.1 **SOAP Request**

8.9.1.1 Success

```
<SOAP-ENV:Envelope    xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
    <GetTagHistoryListByArgs>

        <AesBusinessSession    clientIPAddress="10.77.144.120"    groupId="1"    id="30210"
lastAccessTime="1248700729287" mask="-1" startTime="1248700728501" userId="1"/>

        <AesHistoryQueryArgs isCountQuery="false" numOfResults="1"/>

    </GetTagHistoryListByArgs>

</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.9.2 **SOAP Response**

8.9.2.1 Success

```
<SOAP-ENV:Envelope    xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <AesTagHistory macAddress="00:0c:cc:7a:4b:98">
        <statsList>
<AesBaseStats bytesReceived="309237645312" changedOn="1251202515689"
macAddress="00:0c:cc:7a:4b:98" objectId="91" packetsReceived="4294967296" parentId="2"
sourceTimestamp="1251202458137"/>
        </statsList>
        <infoList>
<AesTag batteryStatus="2" changedOn="1251202515689" lastBeaconSeqNum="1500"
lastBeaconTime="0" macAddress="00:0c:cc:7a:4b:98" objectId="4" parentId="2"
propertiesMask="-2" sourceTimestamp="1251202515670">

        <batteryInfo>
<AesBatteryInfo lastReceivedSeqNum="1500" lastReceivedTime="1251202514177"
percentRemaining="80" tolerance="20"/>
        </batteryInfo>

        <vendorData>
<AesVendorData changedOn="1251202515671" data="0,0,0,0," lastReceivedSeqNum="1500"
lastReceivedTime="1251202514177" objectId="4" parentId="4" vendorId="3276"/>
```

```
            </vendorData>

        <telemetryList>
<AesTelemetry changedOn="1251202515670" lastReceivedSeqNum="1500"
lastReceivedTime="1251202514177"
measurementClass="com.aes.datamodel.location.ctx.AesDefaultTelemMeasurement"
objectId="6" parentId="4" type="MOTIONPROB">
            <AesDefaultTelemMeasurement/>
        </AesTelemetry>
        </telemetryList>

        <chokepointEncounterList>
<AesChokepointEncounter changedOn="1251202515671" chokepointMac="00:0c:cc:60:00:00"
index="0" isPerimeter="PERIMETER" objectId="2" parentId="4" timestamp="1251202514177"/>
        </chokepointEncounterList>
        </AesTag>
    </infoList>

    <locationList>
<AesTagLocation areaSize="1" calcFloorId="7" calcX="208.6" calcY="122.57"
cangedOn="1251202515689" chokepointEncounterTime="0" detectingControllers="1.2.3.81"
floorId="7"
fullHierarchy="AesNetworkDesign:testB|AesGroup:testB_Group|AesBuilding:testB|AesFloor:tes
tF" locationContributorMask="2" macAddress="00:0c:cc:7a:4b:98" networkStatus="2"
objectId="4" parentId="2" simpleHierarchy="testB>testB>testF"
sourceTimestamp="1251202515690" x="208.6" y="122.57">
        <areaList area="aa"/>
        <info>
<AesTag batteryStatus="2" changedOn="1251197411927" lastBeaconTime="0"
macAddress="00:0c:cc:7a:4b:98" objectId="3" parentId="2" propertiesMask="-2"
sourceTimestamp="1251197411893">
            <batteryInfo>
<AesBatteryInfo lastReceivedTime="1251197410052" percentRemaining="80"    tolerance="20"/>
            </batteryInfo>
            <vendorData>
<AesVendorData changedOn="1251197411893" data="0,0,0,0," lastReceivedTime="1251197410052"
objectId="3" parentId="3" vendorId="3276"/>
</vendorData>
            <telemetryList>
<AesTelemetry changedOn="1251197411893" lastReceivedTime="1251197410052"
measurementClass="com.aes.datamodel.location.ctx.AesDefaultTelemMeasurement"
objectId="5" parentId="3" type="MOTIONPROB">
                <AesDefaultTelemMeasurement/>
            </AesTelemetry>
            </telemetryList>
            <chokepointEncounterList>
 <AesChokepointEncounter hangedOn="1251197411893" chokepointMac="00:0c:cc:60:00:00"
index="0" isPerimeter="PERIMETER" objectId="1" parentId="3" timestamp="1251197410052"/>
            </chokepointEncounterList>
        </AesTag>
        </info>
    </AesTagLocation>
    </locationList>
```

8.9.3 **SOAP Request**

8.9.3.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
    <GetTagHistoryListByArgs>
<AesBusinessSession     clientIPAddress="10.77.144.120"     groupId="1"     id="30210"
lastAccessTime="1248700729287" mask="-1" startTime="1248700728501" userId="1"/>
      <AesHistoryQueryArgs fromTimeMillis="1251222064455" toTimeMillis="1251233111019"
startIndex="2" isCountQuery="false" numOfResults="1"/>

    </GetTagHistoryListByArgs>
```

```
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.9.4 **SOAP Response**

8.9.4.1 Success

```
<SOAP-ENV:Envelope    xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
  <AesTagHistory macAddress="00:0c:cc:7a:4b:98">
    <statsList>
      <AesBaseStats bytesReceived="309237645312" changedOn="1251227755452"
macAddress="00:0c:cc:7a:4b:98" objectId="173" packetsReceived="4294967296" parentId="2"
sourceTimestamp="1251223008683"/>
    </statsList>
    <infoList>
      <AesTag batteryStatus="2" changedOn="1251227755452" lastBeaconTime="0"
macAddress="00:0c:cc:7a:4b:98" objectId="12" parentId="2" propertiesMask="-2"
sourceTimestamp="1251227755433">
        <batteryInfo>
          <AesBatteryInfo lastReceivedTime="1251227754547" percentRemaining="80"
tolerance="20"/>
        </batteryInfo>
        <vendorData>
          <AesVendorData changedOn="1251227755434" data="0,0,0,0,"
lastReceivedTime="1251227754547" objectId="12" parentId="12" vendorId="3276"/>
        </vendorData>
        <telemetryList>
          <AesTelemetry changedOn="1251227755434" lastReceivedTime="1251227754547"
measurementClass="com.aes.datamodel.location.ctx.AesDefaultTelemMeasurement"
objectId="18" parentId="12" type="MOTIONPROB">
            <AesDefaultTelemMeasurement/>
          </AesTelemetry>
        </telemetryList>
        <chokepointEncounterList>
          <AesChokepointEncounter changedOn="1251227755434"
chokepointMac="00:0c:cc:60:00:00" index="0" isPerimeter="PERIMETER" objectId="8"
parentId="12" timestamp="1251227754547"/>
        </chokepointEncounterList>
      </AesTag>
    </infoList>
    <locationList>
      <AesTagLocation calcFloorId="7" calcX="208.4" calcY="162.8"
changedOn="1251227755452" chokepointEncounterTime="0" detectingControllers="1.2.3.81"
floorId="7"
fullHierarchy="AesNetworkDesign:testB|AesGroup:testB_Group|AesBuilding:testB|AesFloor:tes
tF" locationContributorMask="2" macAddress="00:0c:cc:7a:4b:98" networkStatus="2"
objectId="12" parentId="2" simpleHierarchy="testB>testB>testF"
sourceTimestamp="1251227755452" x="208.4" y="162.8">
        <info>
          <AesTag batteryStatus="2" changedOn="1251197411927" lastBeaconTime="0"
macAddress="00:0c:cc:7a:4b:98" objectId="3" parentId="2" propertiesMask="-2"
sourceTimestamp="1251197411893">
            <batteryInfo>
              <AesBatteryInfo lastReceivedTime="1251197410052" percentRemaining="80"
tolerance="20"/>
            </batteryInfo>
            <vendorData>
```

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```
                    <AesVendorData changedOn="1251197411893" data="0,0,0,0,"
lastReceivedTime="1251197410052" objectId="3" parentId="3" vendorId="3276"/>
              </vendorData>
              <telemetryList>
                <AesTelemetry changedOn="1251197411893"
lastReceivedTime="1251197410052"
measurementClass="com.aes.datamodel.location.ctx.AesDefaultTelemMeasurement"
                  <AesDefaultTelemMeasurement/>
                </AesTelemetry>
              </telemetryList>
              <chokepointEncounterList>
                <AesChokepointEncounter changedOn="1251197411893"
chokepointMac="00:0c:cc:60:00:00" index="0" isPerimeter="PERIMETER" objectId="1"
parentId="3" timestamp="1251197410052"/>
              </chokepointEncounterList>
            </AesTag>
          </info>
        </AesTagLocation>
      </locationList>
    </AesTagHistory>
</Response>
        </SOAP-ENV:Body>
        </SOAP-ENV: Envelope>
```

8.10 METHOD: AddTagAssetInfo

Adds an Asset info with predefined Tag macAddress to the MSE. Existing AssetInfo if any is overwritten.

Result: An AesResult object specifies the success or failure of the operation.

Arguments: AesBusinessSession, asset object containing the information

8.10.1   **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
   <SOAP-ENV:Body>
      <AddTagAssetInfo macAddress="00:40:96:b1:be:e3"
xmlns="http://cisco.com/mse/location" xmlns:typ="http://cisco.com/mse/types">
        <typ:AesBusinessSession id="5760"/>
        <asset assetCategory="Test Clients" assetGroup="Lab" assetName="Cisco T61P"/>
</AddTagAssetInfo>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.10.2   **SOAP Response**

8.10.2.1   **Success**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
  <SOAP-ENV:Body>
     <Response xmlns=" http://cisco.com/mse/location">
        <AesResult result="true" resultArg="162" resultArgClass="java.lang.Long"/>
     </Response>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.11 METHOD: ModifyTag

Modifies the tag information.

Result: An AesResult object specifying the success or failure of the operation.

Arguments: AesBusinessSession, AesTag object containing measurements and so on.

Note: To add/modify asset info, use AddTagAssetInfo API

8.11.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <ModifyTag xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesTag macAddress="00:01:02:03:04:05">
                <asset name="tag-name" category="tags"/>
            </AesTag>
        </ModifyTag>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.11.2 **SOAP Response**

8.11.2.1 **Success**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesResult result="true"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.12 METHOD: GetTagInfoListForTelemetry

Queries the list of all tags in the server with telemetry values defined. If the Tags have telemetry information, the telemetry information will be available in the AesTelemetry object. The query can be:

- NULL -Return all tags with telemetry information and their contents.

- Count Query - Return the number of tag with telemetry information in the server

- All other queries (sorting, paging, member match and so on) - The list of tags with telemetry information and their content, constrained based on the query content.

Result: AesTag or AesResult

Arguments: AesBusinessSession.

8.12.1 Count Query:

8.12.1.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
   <SOAP-ENV:Body>
     <GetTagInfoListForTelemetry xmlns=" http://cisco.com/mse/location">
       <AesBusinessSession id="17768" mask="-1"/>
       <AesQueryCriteria isCountQuery="true" options="1">
        <and-list>
           <AesMatchMbrCriteria matchClass="AesTag" matchMbr="changedOn"
matchValue="1169727771043" operator="2" valueClass="java.lang.Long"/>
        </and-list>
       </AesQueryCriteria>
     </GetTagInfoListForTelemetry>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.12.1.2 SOAP Response

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
  <SOAP-ENV:Body>
    <Response xmlns=" http://cisco.com/mse/location">
      <AesResult result="true" resultArg="5" resultArgClass="java.lang.Integer"/>
    </Response>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.12.2 Tag Info Query

8.12.2.1 SOAP Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
   <GetTagInfoListForTelemetry xmlns=" http://cisco.com/mse/location">
      <AesBusinessSession id="31111" mask="-1"/>
      <AesQueryCriteria numOfResults="20" options="1">
       <and-list>
          <AesMatchMbrCriteria matchClass="AesTag" matchMbr="changedOn"
matchValue="1170642751523" operator="2" valueClass="java.lang.Long"/>
       </and-list>
       <sortCriteria>
          <AesSortCriteria isDescending="true" sortColumns="AesTag.macAddress,"/>
       </sortCriteria>
      </AesQueryCriteria>
   </GetTagInfoListForTelemetry>
</SOAP-ENV:Body>
```

8.12.2.2 SOAP Response

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
 <Response xmlns=" http://cisco.com/mse/location">
   <AesTag  changedOn="1170728991416"  lastReported="43"  macAddress="00:12:b8:00:20:52"
objectId="13" switchRef="anto-wlc-lab">
     <batteryInfo>
       <AesBatteryInfo batteryAge="2147483647" daysRemaining="-1" percentRemaining="90"
tolerance="30"/>
     </batteryInfo>
   </AesTag>
```

```
        <AesTag  changedOn="1170728615238"  lastReported="18"  macAddress="00:0c:cc:5c:87:34"
objectId="12" switchRef="anto-wlc-lab">
        <batteryInfo>
          <AesBatteryInfo percentRemaining="80" tolerance="20"/>
        </batteryInfo>
      </AesTag>
      <AesTag  changedOn="1170728247894"  lastReported="139"  macAddress="00:0c:cc:5c:5a:2b"
objectId="7" switchRef="anto-wlc-lab">
        <asset>
          <AesAsset assetCategory="test1" assetGroup="test12" assetName="test123"/>
        </asset>
        <batteryInfo>
          <AesBatteryInfo percentRemaining="80" tolerance="20"/>
        </batteryInfo>
      </AesTag>
      <AesTag  changedOn="1170717956090"  lastReported="101"  macAddress="00:0c:cc:5c:05:12"
objectId="6" switchRef="anto-wlc-lab">
        <asset>
          <AesAsset assetCategory="CCC" assetGroup="CCC" assetName="CCC"/>
        </asset>
        <batteryInfo>
          <AesBatteryInfo percentRemaining="80" tolerance="20"/>
        </batteryInfo>
      </AesTag>
      <AesTag  changedOn="1170728799061"  lastReported="97"  macAddress="00:0c:cc:5c:05:10"
objectId="14" switchRef="anto-wlc-lab">
        <batteryInfo>
          <AesBatteryInfo percentRemaining="80" tolerance="20"/>
        </batteryInfo>
      </AesTag>
  </Response>
</SOAP-ENV:Body>
```

8.13 METHOD: GetTagLocationListForTelemetry

Queries the list of all tag's locations in the server with telemetry values defined. If the Tags have telemetry information, the telemetry information will be available in the AesTelemetry object. The query can be:

- NULL -Return all tag's location with telemetry information and their contents.

- Count Query -Return the number of tag with telemetry information in the server

- All other queries (sorting, paging, member match and so on) - The list of tag's location with telemetry information and their content, constrained based on the query content.

Note: *If the attribute "locationContributorMask" has value =1, then the Tag's location is based on the chokepoint and if its value is 2 then the location is based on RSSI value.*

Result: AesTagLocation object

Arguments: AesBusinessSession, query criteria

8.13.1 **Soap Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<GetTagLocationListForTelemetry xmlns="http://cisco.com/mse/location"
                                      xmlns:typ="http://cisco.com/mse/types">
        <typ:AesBusinessSession id="26703"/>
        <typ:AesQueryCriteria startIndex="2" numOfResults="3"/>
</GetTagLocationListForTelemetry>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

8.13.2 **Soap Response**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">

<SOAP-ENV:Body>
            <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
            ENV="http://schemas.xmlsoap.org/soap/envelope/">

            <AesTagLocation calcFloorAesUId="-6104764736694386570" calcFloorId="4135"
            calcX="144.0" calcY="64.0" changedOn="1302695989753"
            chokepointEncounterTime="0" confidenceFactor="360.0"
            detectingControllers="1.2.3.72" firstActiveAt="1302695841276"
            floorAesUId="-6104764736694386570" floorId="4135" floorWeight="18"
            locationContributorMask="2" macAddress="00:06:66:13:ee:4a"
            minLastHeardSecs="13" networkStatus="1" objectId="162" reason="0"
            sourceTimestamp="1302695989753" x="144.0" y="64.0">

    <info>

      <AesTag batteryStatus="2" changedOn="1302695916115" lastBeaconSeqNum="1483"
            lastBeaconTime="0" macAddress="00:06:66:13:ee:4a" objectId="164">

        <batteryInfo>

          <AesBatteryInfo batteryAge="40" daysRemaining="1055" lastReceivedSeqNum="1483"
            lastReceivedTime="1302695913732" percentRemaining="90" tolerance="30"/>

        </batteryInfo>

        <telemetryList>

          <AesTelemetry changedOn="1302695916115" lastReceivedSeqNum="1483"
            lastReceivedTime="1302695913732"
            measurementClass="com.aes.datamodel.location.ctx.AesDefaultTelemMeasuremen
            t" objectId="239661" parentId="164" type="TEMPERATURE" units="degrees
            Celsius">

            <AesDefaultTelemMeasurement measurementClass="java.lang.Float"
                measurementObj="25.0"/>

            <objectId mask="25.0" parentId="java.lang.Float"/>

          </AesTelemetry>

        </telemetryList>

      </AesTag>

    </info>
```

```
</AesTagLocation>

<AesTagLocation calcFloorAesUId="-6104764736694386568" calcFloorId="4126" calcX="92.8"
           calcY="87.51" changedOn="1302695007211" chokepointEncounterTime="0"
           confidenceFactor="224.0" detectingControllers="1.2.3.70"
           firstActiveAt="1302692214997" floorAesUId="-6104764736694386568"
           floorId="4126" floorWeight="26" fullHierarchy="AesNetworkDesign:System
           Campus|AesBuilding:sjc-14|AesFloor:lab" locationContributorMask="2"
           macAddress="00:06:66:13:ee:56" minLastHeardSecs="13" networkStatus="1"
           objectId="167" reason="0" simpleHierarchy="System Campus>sjc-14>lab"
           size="4" sourceTimestamp="1302695007211" x="92.8" y="87.51">

  <floorHierarchy elem="lab"/>

  <floorHierarchy elem="sjc-14"/>

  <floorHierarchy elem="System Campus"/>

  <floorHierarchy elem=""/>

  <info>

    <AesTag batteryStatus="2" changedOn="1302694996123" lastBeaconSeqNum="2370"
           lastBeaconTime="0" macAddress="00:06:66:13:ee:56" objectId="167"
           parentId="167">

      <batteryInfo>

        <AesBatteryInfo batteryAge="43" daysRemaining="1052" lastReceivedSeqNum="2370"
           lastReceivedTime="1302694993929" percentRemaining="90" tolerance="30"/>

      </batteryInfo>

      <telemetryList>

        <AesTelemetry changedOn="1302694996135" lastReceivedSeqNum="2370"
           lastReceivedTime="1302694993929"
           measurementClass="com.aes.datamodel.location.ctx.AesDefaultTelemMeasuremen
           t" objectId="239623" parentId="167" type="TEMPERATURE" units="degrees
           Celsius">

          <AesDefaultTelemMeasurement measurementClass="java.lang.Float"
           measurementObj="25.0"/>

          <objectId mask="25.0" parentId="java.lang.Float"/>

        </AesTelemetry>

      </telemetryList>

    </AesTag>

  </info>

</AesTagLocation>

<AesTagLocation calcFloorAesUId="-6104764736694386568" calcFloorId="4133" calcX="74.52"
           calcY="151.77" changedOn="1302695989755" chokepointEncounterTime="0"
```

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```xml
                confidenceFactor="88.0" detectingControllers="1.2.3.70,1.2.3.72,1.2.3.75,"
                firstActiveAt="1302695717163" floorAesUID="-6104764736694386568"
                floorId="4133" floorWeight="85" locationContributorMask="2"
                macAddress="00:0c:cc:5c:05:16" minLastHeardSecs="6" networkStatus="1"
                objectId="158" reason="0" sourceTimestamp="1302695989755" x="74.52"
                y="151.77">

      <info>

        <AesTag batteryStatus="2" changedOn="1302695924196" lastBeaconSeqNum="1908"
                lastBeaconTime="0" macAddress="00:0c:cc:5c:05:16" objectId="162"
                parentId="158" propertiesMask="-2">

          <batteryInfo>

            <AesBatteryInfo lastReceivedSeqNum="1908" lastReceivedTime="1302695923815"
                percentRemaining="80" tolerance="20"/>

          </batteryInfo>

          <vendorData>

            <AesVendorData changedOn="1302695924198" data="110,19,-93,0,0,"
                lastReceivedSeqNum="1905" lastReceivedTime="1302695921004"
                objectId="236934" parentId="162" vendorId="3276"/>

          </vendorData>

          <telemetryList>

            <AesTelemetry changedOn="1302695924196" lastReceivedSeqNum="1908"
                lastReceivedTime="1302695923815"
                measurementClass="com.aes.datamodel.location.ctx.AesDefaultTelemMeasu
                rement" objectId="239665" parentId="162" type="MOTIONPROB">

              <AesDefaultTelemMeasurement/>

            </AesTelemetry>

          </telemetryList>

          <chokepointEncounterList>

            <AesChokepointEncounter changedOn="1302695924199"
                chokepointMac="00:0c:cc:60:13:a3" index="0" isActive="false"
                isPerimeter="NON_PERIMETER" objectId="165558" parentId="162"
                timestamp="1302695921004"/>

          </chokepointEncounterList>

        </AesTag>

      </info>

    </AesTagLocation>

</Response>

</SOAP-ENV:Body>

</SOAP-ENV:Envelope>
```

CHAPTER 9

₉ Location – Rogues

The rogue interface concentrates on the following areas for rogue APs and clients:

- Calculation of real-time location

- Historical collection of location

9.1 METHOD: GetRogueClientInfoList

Queries the list of rogue clients currently stored in the MSE. The query can be:

- NULL - Return all rogue clients and their contents.

- Count Query - Return the number of rogue clients in the server

- All other queries (sorting, paging, member match and so on) -The list of rogue clients and their content, constrained based on the query content.

Result: See below.

Arguments: AesBusinessSession, AesQueryCriteria.

9.1.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
        <GetRogueClientInfoList xmlns="http://cisco.com/mse/location"
                                xmlns:typ="http://cisco.com/mse/types">
         <typ:AesBusinessSession id="4595"/>
         <typ:AesQueryCriteria startIndex="2" numOfResults="3"/>
        </GetRogueClientInfoList>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

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9.1.2 **SOAP Response**

9.1.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
        <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
                            ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <AesRogueClient bssid="c4:7d:4f:53:24:c1" changedOn="1302699159688"
          firstReported="Wed Apr 13 02:51:28 HST 2011"
          lastReported="Wed Apr 13 02:52:39 HST 2011"
          macAddress="00:1f:6c:7a:b7:c6" numOfDetectingAPs="5" objectId="4" state="2"
          switchName="loc-wlc-04"/>
        <AesRogueClient bssid="00:22:90:95:fa:d3" changedOn="1302699159854"
          firstReported="Wed Apr 13 02:52:38 HST 2011"
          lastReported="Wed Apr 13 02:52:39 HST 2011" macAddress="00:25:45:b2:56:f1"
          numOfDetectingAPs="4" objectId="9" state="2" switchName="loc-wlc-05"/>
        <AesRogueClient bssid="00:17:df:a8:5a:fe" changedOn="1302695537732"
          firstReported="Wed Apr 13 01:52:16 HST 2011"
          lastReported="Wed Apr 13 01:52:16 HST 2011" macAddress="c4:71:fe:d7:1f:96"
          numOfDetectingAPs="9" objectId="20" state="2" switchName="loc-wlc-05"/>
        </Response>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.2 METHOD: GetRogueClientInfo

Returns a rogue client currently stored in the MSE based on various search criteria.

Result: AesRogueClient object or null if not found.

Arguments: AesBusinessSession, AesRogueClient Key

9.2.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetRogueClientInfo xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesRogueClient macAddress="00:01:02:03:04:05"/>
        </GetRogueClientInfo>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.2.2 **SOAP Response**

9.2.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
<Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
  <AesRogueClient bssid="00:1e:7a:70:c0:b0" changedOn="1280797393211" firstReported="Mon
Aug 02 18:03:12 PDT 2010" lastReported="Mon Aug 02 18:03:12 PDT 2010"
macAddress="00:1a:73:14:2d:7d" numOfDetectingAPs="2" objectId="1137" state="2"
switchName="loc-wlc-04"/>
</Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.3 METHOD: GetRogueClientLocation

Returns an AesRogueClientLocation location record currently stored in the MSE.

Result: An AesRogueClientLocation object or null if not found.

Arguments: AesBusinessSession, AesRogueClient Key

9.3.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetRogueClientLocation xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesRogueClient macAddress="00:01:02:03:04:05"/>
        </GetRogueClientLocation>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.3.2 **SOAP Response**

9.3.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesRogueClientLocation macAddress="00:01:02:03:04:05" changedOn="122122111"
floorId="10" x="12.1" y="34.6" z="2"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.4 METHOD: GetRogueClientLocationList

Queries the list of AesRogueClientLocation records currently stored in the MSE. The query can be:

- NULL - Return all rogue client locations and their contents.

- Count Query - Return the number of rogue client locations in the server.

- All other queries (sorting, paging, member match and so on) - The list of rogue client locations and their content, constrained based on the query content.

Result: See below.

Arguments: AesBusinessSession, AesQueryCriteria

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9.4.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetRogueClientLocationList xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
        </GetRogueClientLocationList>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.4.2 **SOAP Response**

9.4.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesRogueClientLocation macAddress="00:01:02:03:04:05" changedOn="122122111"
floorId="10" x="12.1" y="34.6" z="2"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.5 METHOD: GetRogueClientHistory

Returns an AesRogueClientHistory history record currently stored in the MSE based on various search criteria.

Result: An AesRogueClientHistory object or null if not found.

Arguments: AesBusinessSession, AesQueryCriteria

9.5.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
   <GetRogueClientHistory xmlns=" http://cisco.com/mse/location">
       <AesBusinessSession id="10510"/>
       <AesQueryCriteria numOfResults="3 isCountQuery="true">
       <and-list>
        <AesMatchMbrCriteria   matchClass="AesRougeClientHistory"   matchMbr="macAddress"
        matchValue="00:09:b7:13:aa:96" valueClass="java.lang.String"/>
       </and-list>
       </AesQueryCriteria>
       </GetRogueClientHistory>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.5.2 **SOAP Response**

9.5.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
    <Response xmlns=" http://cisco.com/mse/location">
        </Response>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.6 METHOD: GetRogueClientHistoryListByArgs

Queries the list of AesRogueClientHistory history records currently stored in the MSE. The query can be:

- Count Query — Return the number of rogue client history records in the MSE. The user can set either isCountQuery=true or false. If the isCountQuery=true, the user will only get the total count of AesRogueClientHistory records. In such a case, the numOfResults field will not be required. If the isCountQuery=false, then the user will have to specify a value for the numOfResults field which should be in between 1 to 100.

- All other queries (floorId, macAddress, numOfResults, fromTimeMillis, toTimeMillis, startIndex) — The list of rogue client history records and their content, constrained based on the query content. If startIndex field is not set, it will return the first x (numOfResults value) results found in the MSE. The remaining fields are optional.

Result: See below.

Arguments: AesBusinessSession, AesHistoryQueryArgs

9.6.1 **SOAP Request**

```
<SOAP-ENV:Envelope
    xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetRogueClientHistoryListByArgs>
<AesBusinessSession    clientIPAddress="10.77.144.120"    groupId="1"    id="30210"
lastAccessTime="1248700729287" mask="-1" startTime="1248700728501" userId="1"/>
            <AesHistoryQueryArgs floorId="3"
                fromTimeMillis="1239234294172" isCountQuery="false"
                macAddress="00:21:00:6a:2a:81" numOfResults="1"
                toTimeMillis="1240362796524" />
        </GetRogueClientHistoryListByArgs>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.6.2 **SOAP Response**

9.6.2.1 Success

```
<SOAP-ENV:Envelope
    xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response>
<AesRogueClientHistory macAddress="00:21:00:6a:2a:81">
            <infoList>
            <AesRogueClient bssid="00:14:1b:62:5b:61"
            changedOn="1240362796522"
            firstReported="Tue Apr 21 18:00:44 PDT 2009"
```

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```
            lastReported="Tue Apr 21 18:00:55 PDT 2009"
            macAddress="00:21:00:6a:2a:81" numOfDetectingAPs="2" objectId="11"
            parentId="1" sourceTimestamp="1240362055216" state="2"
            switchName="loc-wlc-03" />

            <AesRogueClient bssid="00:14:1b:62:5b:61"
            changedOn="1240355640644"
            firstReported="Tue Apr 21 16:12:39 PDT 2009"
            lastReported="Tue Apr 21 16:12:44 PDT 2009"
            macAddress="00:21:00:6a:2a:81" numOfDetectingAPs="1" objectId="1"
            parentId="1" sourceTimestamp="1240355564288" state="2"
            switchName="loc-wlc-03" />
            </infoList>

        <locationList>

        <AesRogueClientLocation changedOn="1240362796522" confidenceFactor="239.2"
detectingControllers=",1.2.3.48,1.2.3.50" floorId="3" floorWeight="203"
                fullHierarchy="AesNetworkDesign:testB|AesGrou|…….
            </AesRogueClientLocation>
        </locationList>

            </AesRogueClientHistory>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.7 METHOD: GetRogueAPInfoList

Queries the list of rogue APs currently stored in the MSE. The query can be:

- NULL - Return all rogue APs and their contents.

- Count Query - Return the number of rogue APs in the server

- All other queries (sorting, paging, member match and so on) - The list of rogue APs and their content, constrained based on the query content.

Result: See below.

Arguments: AesBusinessSession, AesQueryCriteria.

9.7.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
 <GetRogueAPInfoList xmlns="http://cisco.com/mse/location"
                                    xmlns:typ="http://cisco.com/mse/types">
        <typ:AesBusinessSession id="15492"/>
        <typ:AesQueryCriteria startIndex="2" numOfResults="3"/>
 </GetRogueAPInfoList>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.7.2 **SOAP Response**

9.7.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
            <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
                                    ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <AesRogueAP changedOn="1302695537779" containmentLevel="0"
         detectingAPRadioType="0" firstReported="Wed Apr 13 01:49:49 HST 2011"
         lastReported="Wed Apr 13 01:52:17 HST 2011" macAddress="00:19:a9:55:cc:03"
         maxDetectedRssi="0" maxDetectingAPMacAddress="" maxRssiRadioType="0"
         numOfDetectingAPs="2" objectId="7" onNetwork="0" ssid="" state="2"
         switchName="loc-wlc-05" totalClients="0" type="0"/>
        <AesRogueAP changedOn="1302695537780" containmentLevel="0"
         detectingAPRadioType="0" firstReported="Wed Apr 13 01:49:50 HST 2011"
         lastReported="Wed Apr 13 01:52:17 HST 2011" macAddress="00:19:a9:55:cc:04"
         maxDetectedRssi="0" maxDetectingAPMacAddress="" maxRssiRadioType="0"
         numOfDetectingAPs="3" objectId="8" onNetwork="0" ssid="" state="2"
         switchName="loc-wlc-05" totalClients="0" type="0"/>
        <AesRogueAP changedOn="1302689860368" containmentLevel="0"
         detectingAPRadioType="0" firstReported="Wed Apr 13 00:17:40 HST 2011"
         lastReported="Wed Apr 13 00:17:40 HST 2011" macAddress="00:1a:30:c1:f6:23"
         maxDetectedRssi="0" maxDetectingAPMacAddress="" maxRssiRadioType="0"
         numOfDetectingAPs="1" objectId="11" onNetwork="0" ssid="" state="3"
         switchName="loc-wlc-05" totalClients="0" type="0"/>

        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.8 METHOD: GetRogueAPInfo

Returns a rogue AP currently stored in the MSE based on various search criteria.

Result: An AesRogueAP object or null if not found.

Arguments: AesBusinessSession, AesRogueAP Key

9.8.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetRogueAPInfo xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesRogueAP macAddress="00:01:02:03:04:05"/>
        </GetRogueAPInfo>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.8.2 SOAP Response

9.8.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesRogueAP macAddress="00:01:02:03:04:05"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.9 METHOD: GetRogueAPLocationListByArgs

Queries the list of AesRogueAPLocation location records currently stored in the MSE. The query can be:

- Count Query—Return the number of mobile station location records in the MSE. The user can either set isCountQuery=true or false. If the isCountQuery=true, the user will only get the total count of MobileStation location records. In such a case, the numOfResults field will not be required. If isCountQuery=false, then the user will have to specify a value for the numOfResults field which should be in the limit of 1 to 100.

- All other queries (floorId, numOfResults, fromTimeMillis, toTimeMillis, startIndex)—The list of mobile station location records and their content, constrained based on the query content. If startIndex field is not set, it will return the first x (numOfResults value) results found in the MSE. The remaining fields are optional.

Result: See below.

Arguments: AesBusinessSession, AesRogueAPQueryArgs.

9.9.1 SOAP Request

```
    <SOAP-ENV:Envelope  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
    <GetRogueAPLocationListByArgs xmlns="http://cisco.com/mse/location"
xmlns:typ="http://cisco.com/mse/types">
      <typ:AesBusinessSession id="8698"/>
      <AesRogueAPQueryArgs fromTimeMillis="127648582300" toTimeMillis="1286542348034"
isCountQuery="false" numOfResults="10">
         <sortCriteriaList>
           <typ:SortColumnCriteria isDescending="true" sortColumn="changedOn"/>
         </sortCriteriaList>
         <floorIdList>
           <floorId>11</floorId>
         </floorIdList>
      </AesRogueAPQueryArgs>
    </GetRogueAPLocationListByArgs>
    </SOAP-ENV:Body>
    </SOAP-ENV:Envelope>
```

9.9.2 **SOAP Response**

9.9.2.1 Success

```
        <SOAP-ENV:Envelope  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
         <Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <loc:AesRogueClientLocation changedOn="1286499928533" confidenceFactor="256.0"
detectingControllers="1.2.3.70,1.2.3.72," firstActiveAt="1286499884183" floorAesUId="-
6047451310117093366" floorId="10" floorWeight="6" fullHierarchy="AesNetworkDesign:System
Campus|AesBuilding:b2|AesFloor:f-72" macAddress="00:21:6a:1e:df:36" minLastHeardSecs="12"
networkStatus="1" objectId="4" reason="0" simpleHierarchy="System Campus>b2>f-72"
sourceTimestamp="1286499928533" x="147.68" y="73.41">
            <loc:info>
             <loc:AesRogueClient bssid="58:bc:27:92:4d:49" changedOn="1286499729873"
firstReported="Fri Oct 08 01:01:59 UTC 2010" lastReported="Fri Oct 08 01:02:09 UTC 2010"
macAddress="00:21:6a:1e:df:36" numOfDetectingAPs="8" objectId="6" state="2"
switchName="wlc-76"/>
            </loc:info>
        </loc:AesRogueClientLocation>
        <loc:AesRogueClientLocation changedOn="1286495702432" confidenceFactor="272.0"
detectingControllers="1.2.3.72" firstActiveAt="1286495660196" floorAesUId="-
6047451310117093366" floorId="10" floorWeight="5" fullHierarchy="AesNetworkDesign:System
Campus|AesBuilding:b2|AesFloor:f-72" macAddress="00:1d:e0:99:76:65" minLastHeardSecs="12"
networkStatus="1" objectId="144" reason="0" simpleHierarchy="System Campus>b2>f-72"
sourceTimestamp="1286495702432" x="386.64" y="77.04">
            <loc:info>
             <loc:AesRogueClient bssid="58:bc:27:92:6e:89" changedOn="1286495717687"
firstReported="Thu Oct 07 23:55:17 UTC 2010" lastReported="Thu Oct 07 23:55:17 UTC 2010"
macAddress="00:1d:e0:99:76:65" numOfDetectingAPs="4" objectId="172" state="2"
switchName="wlc-76"/>
            </loc:info>
        </loc:AesRogueClientLocation>
     </Response>
     </SOAP-ENV:Body>
     </SOAP-ENV:Envelope>
```

9.10 METHOD: GetRogueAPLocation

Returns an AesRogueAPLocation location record currently stored in the MSE.

Result: An AesRogueAPLocation object or null if not found.

Arguments: AesBusinessSession, AesRogueAP Key

9.10.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetRogueAPLocation xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="2554"/>
            <AesRogueAP macAddress="00:01:02:03:04:05"/>
        </GetRogueAPLocation>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

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9.10.2 **SOAP Response**

9.10.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesRogueAPLocation   macAddress="00:01:02:03:04:05"   changedOn="122122111"
floorId="10" x="12.1" y="34.6" z="2"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.11 METHOD: GetRogueAPLocationList

Queries the list of AesRogueAPLocation records currently stored in the MSE. The query can be:

- NULL - Return all rogue AP locations and their contents.

- Count Query - Return the number of rogue AP locations in the server.

- All other queries (sorting, paging, member match and so on) - The list of rogue AP locations and their content, constrained based on the query content.

Result: See below.

Arguments: AesBusinessSession, AesQueryCriteria

9.11.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<GetRogueAPLocationList xmlns="http://cisco.com/mse/location"
                                    xmlns:typ="http://cisco.com/mse/types">
        <typ:AesBusinessSession id="2436"/>
        <typ:AesQueryCriteria startIndex="2" numOfResults="3"/>
</GetRogueAPLocationList>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.11.2 **SOAP Response**

9.11.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <AesRogueAPLocation changedOn="1302698867573" confidenceFactor="112.0"
detectingControllers="1.2.3.75" floorAesUId="-6047451202742910766" floorId="21"
floorWeight="32" fullHierarchy="AesNetworkDesign:Site4|AesBuilding:SJC-14|AesFloor:Floor-
2" macAddress="00:1a:30:c3:43:c0" minLastHeardSecs="264" networkStatus="2" objectId="6"
reason="0" simpleHierarchy="Site4>SJC-14>Floor-2" size="4"
sourceTimestamp="1302698805956" x="375.99" y="327.96">
            <floorHierarchy elem="Floor-2"/>
            <floorHierarchy elem="SJC-14"/>
            <floorHierarchy elem="Site4"/>
```

```
            <floorHierarchy elem=""/>
            <info>
               <AesRogueAP changedOn="1302698867227" containmentLevel="0"
detectingAPRadioType="0" firstReported="Wed Apr 13 02:17:47 HST 2011" lastReported="Wed
Apr 13 02:47:47 HST 2011" macAddress="00:1a:30:c3:43:c0" maxDetectedRssi="0"
maxDetectingAPMacAddress="" maxRssiRadioType="0" numOfDetectingAPs="2" objectId="13"
onNetwork="0" ssid="" state="4" switchName="loc-wlc-04" totalClients="0" type="0"/>
            </info>
         </AesRogueAPLocation>
         <AesRogueAPLocation changedOn="1302663691374" confidenceFactor="1016.0"
detectingControllers="1.2.3.75" floorAesUId="-6047451202742910766" floorId="21"
floorWeight="17" fullHierarchy="AesNetworkDesign:Site4|AesBuilding:SJC-14|AesFloor:Floor-
2" macAddress="00:1a:30:c3:43:c1" minLastHeardSecs="12" networkStatus="1" objectId="8"
reason="0" simpleHierarchy="Site4>SJC-14>Floor-2" size="4"
sourceTimestamp="1302663691374" x="344.5" y="223.09">
            <floorHierarchy elem="Floor-2"/>
            <floorHierarchy elem="SJC-14"/>
            <floorHierarchy elem="Site4"/>
            <floorHierarchy elem=""/>
            <info>
               <AesRogueAP changedOn="1302698867227" containmentLevel="0"
detectingAPRadioType="0" firstReported="Wed Apr 13 02:38:17 HST 2011" lastReported="Wed
Apr 13 02:47:47 HST 2011" macAddress="00:1a:30:c3:43:c1" maxDetectedRssi="0"
maxDetectingAPMacAddress="" maxRssiRadioType="0" numOfDetectingAPs="2" objectId="14"
onNetwork="0" ssid="" state="2" switchName="loc-wlc-04" totalClients="0" type="0"/>
            </info>
         </AesRogueAPLocation>
         <AesRogueAPLocation changedOn="1302698867576" confidenceFactor="1008.0"
detectingControllers="1.2.3.75" floorAesUId="-6047451202742910766" floorId="21"
floorWeight="52" fullHierarchy="AesNetworkDesign:Site4|AesBuilding:SJC-14|AesFloor:Floor-
2" macAddress="00:19:a9:55:cc:03" minLastHeardSecs="18" networkStatus="2" objectId="12"
reason="0" simpleHierarchy="Site4>SJC-14>Floor-2" size="4"
sourceTimestamp="1302698685111" x="306.12" y="228.84">
            <floorHierarchy elem="Floor-2"/>
            <floorHierarchy elem="SJC-14"/>
            <floorHierarchy elem="Site4"/>
            <floorHierarchy elem=""/>
            <info>
               <AesRogueAP changedOn="1302698867227" containmentLevel="0"
detectingAPRadioType="0" firstReported="Wed Apr 13 02:29:19 HST 2011" lastReported="Wed
Apr 13 02:47:47 HST 2011" macAddress="00:19:a9:55:cc:03" maxDetectedRssi="0"
maxDetectingAPMacAddress="" maxRssiRadioType="0" numOfDetectingAPs="2" objectId="7"
onNetwork="0" ssid="" state="2" switchName="loc-wlc-04" totalClients="0" type="0"/>
            </info>
         </AesRogueAPLocation>
 </Response>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.12 METHOD: GetRogueAPHistory

Returns an AesRogueAPHistory history record currently stored in the MSE based on various search criteria.

Result: An AesRogueAPHistory object or null if not found.

Arguments: AesBusinessSession, AesQueryCriteria.

9.12.1 **SOAP Request**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
      <GetRogueAPHistory xmlns=" http://cisco.com/mse/location">
      <AesBusinessSession id="10510"/>
      <AesQueryCriteria numOfResults="3" isCountQuery="true">
      <and-list>
      <AesMatchMbrCriteria matchClass="AesRougeAPHistory" matchMbr="macAddress"
                matchValue="00:09:b7:13:aa:96" valueClass="java.lang.String"/>
      </and-list>
      </AesQueryCriteria>
      </GetRogueAPHistory>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.12.2 **SOAP Response**

9.12.2.1 **Success**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
      <Response xmlns=" http://cisco.com/mse/location">
      </Response>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.13 METHOD: GetRogueAPHistoryListByArgs

Queries the list of AesRogueAPHistory history records currently stored in the MSE. The query can be:

- Count Query — Return the number of rogue AP history records in the MSE. The user can set either isCountQuery=true or false. If the isCountQuery=true, the user will only get the total count of AesTagHistory records. In such a case, the numOfResults field will not be required. If the isCountQuery=false, then the user will have to specify a value for the numOfResults field which should be in between 1 to 100.

- All other queries (floorId, macAddress, numOfResults, fromTimeMillis, toTimeMillis, startIndex) — The list of rogue AP history records and their content, constrained based on the query content. If startIndex field is not set, it will return the first x (numOfResults value) results found in the MSE. The remaining fields are optional.

Result: See below.

Arguments: AesBusinessSession, AesHistoryQueryArgs

9.13.1 **SOAP Request**

```
<SOAP-ENV:Envelope
   xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
   <SOAP-ENV:Body>
```

```
<AesBusinessSession          clientIPAddress="10.77.144.120"          groupId="1"          id="30210"
lastAccessTime="1248700729287" mask="-1" startTime="1248700728501" userId="1"/>


        <GetRogueAPHistoryListByArgs>
            <AesHistoryQueryArgs floorId="3"
            fromTimeMillis="1239234294172" isCountQuery="true"
            macAddress="00:1d:e6:24:76:2f" numOfResults="1"
            toTimeMillis="1239923737099" />
        </GetRogueAPHistoryListByArgs>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

9.13.2 **SOAP Response**

9.13.2.1 Success

```
<SOAP-ENV:Envelope
    xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response>
            <AesResult result="true" resultArg="0"
            resultArgClass="java.lang.Integer" />
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

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CHAPTER 10

10 **Location Presence**

10.1 AesCapability:

This class represents the location format, resolution and response encoding details used in the MSE.

Class	AesCapability		
	Attribute	**Type**	**Access**
	serviceTypeMask	Int NONE(0x00), ON_DEMAND(0x01), UPDATE(0x02);	RW
	locFormatMask	Int NONE(0x00), CIVIC(0x01), GEO(0x02), CISCO(0x04);	RW
	LocationResolution	LocationResolution NONE(0), BUILDING(1), AP(2), XY(3);	RO

	responseEncodingMask	Int NONE(0x00), ASCII(0x01), FAST_SCHEMA(0x02), FAST_INFOSET(0x04);	RO
	updateIntervalMask	Int NONE(0x00), BACKGROUND(0x01), REGULAR(0x02), EXPEDITED(0x04);	RO
	retransmitRule	boolean	RW
	retentionExpirationMins	long	RO

10.2 METHOD: Get capability

Gets the Presence Parameters currently stored in the server.

Result: AesCapability Object

Arguments: AesBusinessSession, AesQueryCriteria

10.2.1 **SOAP Response**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
        <GetCapability xmlns=" http://cisco.com/mse/location">
                <AesBusinessSession id="10510"/>
            </GetCapability>
        </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

10.2.2 **SOAP Response**

10.2.2.1 **Success**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
                <AesCapability retransmitRule="true"/>
            </Response>
        </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

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10.3 METHOD: Set capabIlity

Sets the Presence Parameters, location format- CISCO, CIVIC, GEO, location resolution – whether it should be based on AP/Building/XY and the responseEncoding to be used in the MSE

Result: AesResult specifying true or false

Arguments: AesBusinessSession, AesCapability Object

10.3.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
        <SetCapability xmlns=" http://cisco.com/mse/location">
                <AesBusinessSession id="387" mask="-1"/>
                <AesCapability locationFormatMask="5" retransmitRule="true"/>
            </SetCapability>
        </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

10.3.2 SOAP Response

10.3.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
                <AesResult result=true"/>
            </Response>
        </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

AesLocationRquest:

This class contains the client details which will be sent as an input to the GetLocation API call.

Class	AesLocationRequest		
	Attribute	**Type**	**Access**
	locFormat	LocationFormat NONE(0x00), CIVIC(0x01), GEO(0x02), CISCO(0x04);	**RW**
	locResolution	LocationResolution	RW

		NONE(0), BUILDING(1), AP(2), XY(3);	
	responseEncoding	ResponseEncoding NONE(0x00), ASCII(0x01), FAST_SCHEMA(0x02), FAST_INFOSET(0x04);	RW
	macList	List<String>	RW
	Requestor	Requestor NorthBound (0) SouthBound(1)	RO

AesLocationResponse:

Elements of this class will be returned as part of GetLocation API call

Class	AesLocationResponse		
	Attribute	**Type**	**Access**
	macResponseList	macResponseList	RO

Class	macResponseList		
	Attribute	**Type**	**Access**
	locFormat	int Enum	RO

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		NONE(0x00), CIVIC(0x01), GEO(0x02), CISCO(0x04);	
	locResolution	int Enum NONE(0), BUILDING(1), AP(2), XY(3);	RO
	responseEncoding	Int enum NONE(0x00), ASCII(0x01), FAST_SCHEMA(0x02), FAST_INFOSET(0x04);	RO
	responseBytes	String (byte[] values)	RO

10.4 METHOD: Get Location

Returns a client location in encoded form.

Result: An AesLocationResponse object which contains client locations in ASCII encoded form or null if not found.

Arguments: AesBusinessSession, AesLocationRequest Object

10.4.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
        <GetLocation xmlns=" http://cisco.com/mse/location">
                <AesBusinessSession id="10261" mask="-1"/>
<AesLocationRequest locFormat="4" locResolution="3" macList="00:1d:e0:09:02:8d,"
responseEncoding="1"/>
            </GetLocation>
```

```
        </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

10.4.2 **SOAP Response**

10.4.2.1 **Success**

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
          <AesLocationResponse>
<macResponseList locationAccuracy="195" macAddress="00:1d:e0:09:02:8d"
responseBytes="60,63,120,109,108,32,118,101,114,115,105,111,110,61,34,49,46,48,34,32,101,
110,99,111,100,105,110,103,61,34,85,84,70,45,56,34,63,62,10,60,65,101,115,77,111,98,105,1
08,101,83,116,97,116,105,111,110,76,111,99,97,116,105,111,110,32,99,104,97,110,103,101,10
0,79,110,61,34,49,50,48,55,55,50,48,55,55,52,49,54,55,34,32,99,111,110,102,105,100,101,11
0,99,101,70,97,99,116,111,114,61,34,54,52,46,48,34,32,100,101,116,101,99,116,105,110,103,
67,111,110,116,114,111,108,108,101,114,115,61,34,49,55,50,46,50,48,46,50,50,54,46,49,51,4
9,34,32,102,108,111,111,114,73,100,61,34,49,34,32,102,108,111,111,114,87,101,105,103,104,
116,61,34,54,55,34,32,102,117,108,108,72,105,101,114,97,114,99,104,121,61,34,65,101,115,7
8,101,116,119,111,114,107,68,101,115,105,103,110,58,83,111,117,116,104,32,67,105,115,99,1
11,32,87,97,121,124,65,101,115,71,114,111,117,112,58,83,111,117,116,104,32,67,105,115,99,
111,32,87,97,121,95,71,114,111,117,112,124,65,101,115,70,108,111,111,114,58,49,115,116,32
,102,108,111,111,114,34,32,109,97,99,65,100,100,114,101,115,115,61,34,48,48,58,49,100,58,
101,48,58,48,57,58,48,50,58,56,100,34,32,109,105,110,76,97,115,116,72,101,97,114,100,83,1
01,99,115,61,34,49,48,34,32,110,101,116,119,111,114,107,83,116,97,116,117,115,61,34,50,34
,32,111,98,106,101,99,116,73,100,61,34,51,50,34,32,115,105,109,112,108,101,72,105,101,114
,97,114,99,104,121,61,34,83,111,117,116,104,32,67,105,115,99,111,32,87,97,121,62,66,117,1
05,108,100,105,110,103,32,49,52,52,62,49,115,116,32,102,108,111,111,114,34,32,115,116,122,10
1,61,34,52,34,32,115,111,117,114,99,101,84,105,109,101,115,116,97,109,112,61,34,49,50,48,
55,55,50,48,55,51,51,53,57,50,34,32,120,61,34,54,52,46,57,55,34,32,121,61,34,52,54,46,49,
49,34,62,60,102,108,111,111,114,72,105,101,114,97,114,99,104,121,32,101,108,101,109,61,34
,49,115,116,32,102,108,111,111,114,34,47,62,60,102,108,111,111,114,72,105,101,114,97,114,
99,104,121,32,101,108,101,109,61,34,66,117,105,108,100,105,110,103,32,49,52,34,47,62,60,1
02,108,111,111,114,72,105,101,114,97,114,99,104,121,32,101,108,101,109,61,34,83,111,117,1
16,104,32,67,105,115,99,111,32,87,97,121,95,71,114,111,117,112,34,47,62,60,102,108,111,111,11
1,114,72,105,101,114,97,114,99,104,121,32,101,108,101,109,61,34,83,111,117,116,104,32,67,
105,115,99,111,32,87,97,121,34,47,62,60,105,110,102,111,62,60,65,101,115,77,111,98,105,108,10
8,101,83,116,97,116,105,111,110,32,97,105,100,61,34,49,34,32,97,110,99,104,111,114,65,100
,100,114,101,115,115,61,34,48,46,48,46,48,46,48,34,32,97,112,73,102,83,108,111,116,73,100
,61,34,49,34,32,97,112,77,97,99,65,100,100,114,101,115,115,61,34,48,48,58,49,52,58,49,98,
58,53,57,58,48,52,58,49,48,34,32,99,99,120,86,101,114,115,105,111,110,61,34,52,34,32,99,1
04,97,110,103,101,100,79,110,61,34,49,50,48,55,55,50,48,55,52,52,52,51,53,54,34,32,101,50,10
1,86,101,114,115,105,111,110,61,34,49,34,32,101,97,112,84,121,112,101,61,34,54,52,34,32,101,
110,99,114,121,112,116,105,111,110,67,121,112,104,101,114,61,34,51,34,32,101,115,115,73,1
10,100,101,120,61,34,49,34,32,105,110,116,101,114,102,97,99,101,83,116,114,61,34,34,32,10
5,112,65,100,100,114,101,115,115,61,34,49,55,50,46,50,48,46,50,50,54,46,49,55,53,34,32,10
9,97,99,65,100,100,114,101,115,115,61,34,48,48,58,49,100,58,101,48,58,48,57,58,48,50,58,5
6,100,34,32,109,111,98,105,108,105,116,121,83,116,97,116,117,115,61,34,49,34,32,111,98,10
6,101,99,116,73,100,61,34,49,34,32,112,111,108,105,99,121,77,97,110,97,103,101,114,83,116
,97,116,101,61,34,82,85,78,34,32,112,111,108,105,99,121,84,121,112,101,61,34,52,32,34,32,112
,114,111,116,111,99,111,108,61,34,49,34,32,114,101,97,115,111,110,67,111,100,101,61,34,57
,55,34,32,115,115,73,100,61,34,108,111,99,45,108,97,98,45,100,101,109,111,34,32,115,116,9
7,116,117,115,61,34,51,34,32,115,119,105,116,99,104,82,101,102,61,34,67,105,115,99,111,95
,53,53,58,99,55,58,52,51,34,32,117,115,101,114,110,97,109,101,61,34,34,47,62,60,47,105,11
0,102,111,62,60,47,65,101,115,77,111,98,105,108,101,83,116,97,116,105,111,110,76,111,99,9
7,116,105,111,110,62,"
/>
</AesLocationResponse>
          </Response>
        </SOAP-ENV:Body>
```

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CHAPTER 11

11 **Wired Module**

MSE functionality is extended to support Wired Clients. With these extensions any client connected to wired or wireless infrastructure could be located and tracked by Location Service. The ability to locate and track the wired client is highly desirable for servers in Data Centers where each server is a wired client associated with a wired Switch port.

11.1 METHOD: GetDeviceList

Returns the list of Wired Clients currently in the MSE.

Result: Response containing multiple device object.

Arguments: AesBusinessSession, AesQueryCriteria Object

11.1.1 **SOAP Request**

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetDeviceList xmlns="http://cisco.com/mse/location">
<AesBusinessSession id="25072" mask="-1"/>
</GetDeviceList>
</SOAP-ENV:Body>
```

11.1.2 **SOAP Response**

11.1.2.1   Success

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"><Response xmlns="
http://cisco.com/mse/types"><Device changedOn="1232346273483" identity="CISCODEVICE002"
objectId="1" parentId="2" serialNumber="CISCO12345678" type="5" udi="UniqueDI2"><location>
<Location changedOn="1232346273487" objectId="1" parent="4" parentId="1"><civicAddress>
<AesCivicAddressField changedOn="1232346273491" field="11" objectId="1" parentId="1"
value="8000"/><AesCivicAddressField changedOn="1232346273491" field="4" objectId="2" parentId="1"
value="Roseville"/><AesCivicAddressField changedOn="1232346273491" field="7" objectId="3"
parentId="1" value="Foothills"/><AesCivicAddressField changedOn="1232346273491" field="19"
objectId="4" parentId="1" value="R3L"/><AesCivicAddressField changedOn="1232346273491" field="1"
objectId="5" parentId="1" value="usa"/><AesCivicAddressField changedOn="1232346273491" field="2"
objectId="6" parentId="1" value="CA"/></civicAddress></Location></location><epInterfaceList>
<WiredInterface changedOn="1232346273484" ipAddress="2.3.4.5" macAddress="00:11:22:33:44:77"
objectId="1" parentId="1" type="1" username802Dot1x="admin"/><WiredInterface
changedOn="1232346273484" ipAddress="2.3.4.6" macAddress="00:11:22:33:44:99" objectId="2"
parentId="1" type="1" username802Dot1x="admin2"/></epInterfaceList></Device></Response></SOAP-
ENV:Body>
```

11.2 METHOD: GetDeviceByIpAddress

Gets the details of specific Wired Client by specifying IPAddress.

Result: Response containing Device object

Arguments: IPAddress as an attribute and AesBusinessSession as an element

11.2.1 **SOAP Request**

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetDeviceByIpAddress IpAddress="2.3.4.5" xmlns="http://cisco.com/mse/location">
<AesBusinessSession id="29320" mask="-1"/>
</GetDeviceByIpAddress>
</SOAP-ENV:Body>
```

11.2.2 **SOAP Response**

11.2.2.1   Success

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<Response xmlns="http://cisco.com/mse/location">
<Device changedOn="1232346273483" identity="CISCODEVICE002" objectId="1" parentId="2"
serialNumber="CISCO12345678" type="5" udi="UniqueDI2">
<location>
<Location/></location>
<epInterfaceList>
<WiredInterface changedOn="1232346273484" ipAddress="2.3.4.5"
macAddress="00:11:22:33:44:77" objectId="1" parentId="1" type="1"
```

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```
username802Dot1x="admin"/>
<WiredInterface changedOn="1232346273484" ipAddress="2.3.4.6"
macAddress="00:11:22:33:44:99" objectId="2" parentId="1" type="1"
username802Dot1x="admin2"/>
</epInterfaceList>
</Device>
</Response>
</SOAP-ENV:Body>
```

11.3 METHOD: GetDeviceByUserName

Gets the details of specific Wired Client by passing username.

Result: Response containing Device object.

Arguments: UserName as an attribute and AesBusinessSession as an element.

11.3.1 SOAP Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetDeviceByUserName userName="admin" xmlns="http://cisco.com/mse/location">
<AesBusinessSession id="8256" mask="-1"/>
</GetDeviceByUserName>
</SOAP-ENV:Body>
```

11.3.2 SOAP Response

11.3.2.1   Success

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<Response xmlns="http://cisco.com/mse/location">
<Device changedOn="1232346273483" identity="CISCODEVICE002" objectId="1" parentId="2"
serialNumber="CISCO12345678" type="5" udi="UniqueDI2">
<location>
<Location/>
</location>
<epInterfaceList><WiredInterface changedOn="1232346273484" ipAddress="2.3.4.5"
macAddress="00:11:22:33:44:77" objectId="1" parentId="1" type="1"
username802Dot1x="admin"/>
<WiredInterface changedOn="1232346273484" ipAddress="2.3.4.6"
macAddress="00:11:22:33:44:99" objectId="2" parentId="1" type="1"
username802Dot1x="admin2"/>
</epInterfaceList>
</Device>
</Response>
</SOAP-ENV:Body>
```

11.4 METHOD: GetDeviceByMac

Gets the details of specific Wired Client by passing macAddess.

Result: Response containing Device object.

Arguments: MacAddress as an attribute and AesBusinessSession as an element.

11.4.1 **SOAP Request**

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetDeviceByMac MacAddress="00:11:22:33:44:77" xmlns="http://cisco.com/mse/location">
<AesBusinessSession id="14766" mask="-1"/>
</GetDeviceByMac>
</SOAP-ENV:Body>
```

11.4.2 **SOAP Response**

11.4.2.1 **Success**

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<Response xmlns="http://cisco.com/mse/location">
<Device changedOn="1232346273483" identity="CISCODEVICE002" objectId="1" parentId="2"
serialNumber="CISCO12345678" type="5" udi="UniqueDI2">
<location>
<Location/>
</location>
<epInterfaceList>
<WiredInterface changedOn="1232346273484" ipAddress="2.3.4.5"
macAddress="00:11:22:33:44:77" objectId="1" parentId="1" type="1"
username802Dot1x="admin"/>
<WiredInterface changedOn="1232346273484" ipAddress="2.3.4.6"
macAddress="00:11:22:33:44:99" objectId="2" parentId="1" type="1"
username802Dot1x="admin2"/>
</epInterfaceList>
</Device>
</Response>
</SOAP-ENV:Body>
```

11.5 METHOD: GetDeviceBySerialNumber

Gets the details of specific Wired Client by passing SerialNumber.

Result: Response containing Device object.

Arguments: SerialNumber as an attribute and AesBusinessSession as an element .

11.5.1 **SOAP Request**

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetDeviceBySerialNumber SerialNumber=" CISCO12345678"
xmlns="http://cisco.com/mse/location">
<AesBusinessSession id="14766" mask="-1"/>
</GetDeviceBySerialNumber></SOAP-ENV:Body>
```

11.5.2 **SOAP Response**

11.5.2.1   Success

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<Response xmlns="http://cisco.com/mse/location">
<Device changedOn="1232346273483" identity="CISCODEVICE002" objectId="1" parentId="2"
serialNumber="CISCO12345678" type="5" udi="UniqueDI2">
<location>
<Location/>
</location>
<epInterfaceList>
<WiredInterface changedOn="1232346273484" ipAddress="2.3.4.5"
macAddress="00:11:22:33:44:77" objectId="1" parentId="1" type="1"
username802Dot1x="admin"/>
<WiredInterface changedOn="1232346273484" ipAddress="2.3.4.6"
macAddress="00:11:22:33:44:99" objectId="2" parentId="1" type="1"
username802Dot1x="admin2"/>
</epInterfaceList>
</Device>
</Response>
</SOAP-ENV:Body>
```

11.6 METHOD: GetDeviceLocationByIpAddress

Gets the location details of specific Wired Client by passing IPAddress.

Result: Response containing Location object.

Arguments: IPAddress as an attribute and AesBusinessSession as an element.

11.6.1 **SOAP Request**

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetDeviceLocationByIpAddress IpAddress="171.71.136.117"
xmlns="http://cisco.com/mse/location">
<AesBusinessSession id="26451" mask="-1"/>
</GetDeviceLocationByIpAddress></SOAP-ENV:Body>
```

11.6.2 **SOAP Response**

11.6.2.1   Success

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<Response xmlns="http://cisco.com/mse/location">
<Location changedOn="1232427886045" elin="00191991919191" objectId="71" parent="5"
parentId="69">
<civicAddress>
<AesCivicAddressField changedOn="1232427886045" field="11" objectId="25563" parentId="71"
value="560"/>
<AesCivicAddressField changedOn="1232427886045" field="15" objectId="25565" parentId="71"
value="1"/>
<AesCivicAddressField changedOn="1232427886045" field="4" objectId="25564" parentId="71"
value="San Jose"/>
<AesCivicAddressField changedOn="1232427886045" field="7" objectId="25566" parentId="71"
```

```
value="Cisco Way"/>
<AesCivicAddressField changedOn="1232427886045" field="25" objectId="25568" parentId="71"
value="A3-4"/>
<AesCivicAddressField changedOn="1232427886045" field="17" objectId="25567" parentId="71"
value="95134"/>
<AesCivicAddressField changedOn="1232427886045" field="18" objectId="25569" parentId="71"
value="SJ-19"/>
<AesCivicAddressField changedOn="1232427886045" field="21" objectId="25570" parentId="71"
value="Office"/>
<AesCivicAddressField changedOn="1232427886045" field="16" objectId="25571" parentId="71"
value="htamvada"/>
<AesCivicAddressField changedOn="1232427886045" field="22" objectId="25572" parentId="71"
value="Cisco Systems, Inc."/>
<AesCivicAddressField changedOn="1232427886045" field="1" objectId="25573" parentId="71"
value="US"/>
<AesCivicAddressField changedOn="1232427886045" field="2" objectId="25574" parentId="71"
value="CA"/>

</civicAddress>
</Location>
</Response>
</SOAP-ENV:Body>
```

11.7 METHOD: GetDeviceLocationByUserName

Gets the location details of specific Wired Client by passing userName.

Result: Response containing Location object.

Arguments: UserName as an attribute and AesBusinessSession as an element.

11.7.1 SOAP Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetDeviceLocationByUserName userName="admin" xmlns="http://cisco.com/mse/location">
<AesBusinessSession id="8256" mask="-1"/>
</GetDeviceLocationByUserName>
</SOAP-ENV:Body>
```

11.7.2 SOAP Response

11.7.2.1   Success

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<Response xmlns="http://cisco.com/mse/location">
<Location changedOn="1232427886045" elin="00191991919191" objectId="71" parent="5"
parentId="69">
<civicAddress>
<AesCivicAddressField changedOn="1232427886045" field="11" objectId="25563" parentId="71"
value="560"/>
<AesCivicAddressField changedOn="1232427886045" field="15" objectId="25565" parentId="71"
value="1"/>
```

```
<AesCivicAddressField changedOn="1232427886045" field="4" objectId="25564" parentId="71"
value="San Jose"/>
<AesCivicAddressField changedOn="1232427886045" field="7" objectId="25566" parentId="71"
value="Cisco Way"/>
<AesCivicAddressField changedOn="1232427886045" field="25" objectId="25568" parentId="71"
value="A3-4"/>
<AesCivicAddressField changedOn="1232427886045" field="17" objectId="25567" parentId="71"
value="95134"/>
<AesCivicAddressField changedOn="1232427886045" field="18" objectId="25569" parentId="71"
value="SJ-19"/>
<AesCivicAddressField changedOn="1232427886045" field="21" objectId="25570" parentId="71"
value="Office"/>
<AesCivicAddressField changedOn="1232427886045" field="16" objectId="25571" parentId="71"
value="htamvada"/>
<AesCivicAddressField changedOn="1232427886045" field="22" objectId="25572" parentId="71"
value="Cisco Systems, Inc."/>
<AesCivicAddressField changedOn="1232427886045" field="1" objectId="25573" parentId="71"
value="US"/>
<AesCivicAddressField changedOn="1232427886045" field="2" objectId="25574" parentId="71"
value="CA"/>
</civicAddress>
</Location>
</Response>
</SOAP-ENV:Body>
```

11.8 METHOD: GetDeviceLocationByMac

Gets the location details of specific Wired Client by passing macAddess.

Result: Response containing Location object.

Arguments: MacAddress as an attribute and AesBusinessSession as an element.

11.8.1 SOAP Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetDeviceLocationByMac MacAddress="00:11:22:33:44:77"
xmlns="http://cisco.com/mse/location">
<AesBusinessSession id="14766" mask="-1"/>
</GetDeviceLocationByMac>
</SOAP-ENV:Body>
```

11.8.2 SOAP Response

11.8.2.1 Success

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<Response xmlns="http://cisco.com/mse/location"><Location changedOn="1232427886045"
elin="00191991919191" objectId="71" parent="5" parentId="69">
<civicAddress>
<AesCivicAddressField changedOn="1232427886045" field="11" objectId="25563" parentId="71"
value="560"/>
<AesCivicAddressField changedOn="1232427886045" field="15" objectId="25565" parentId="71"
value="1"/>
<AesCivicAddressField changedOn="1232427886045" field="4" objectId="25564" parentId="71"
value="San Jose"/>
<AesCivicAddressField changedOn="1232427886045" field="7" objectId="25566" parentId="71"
```

```
value="Cisco Way"/>
<AesCivicAddressField changedOn="1232427886045" field="25" objectId="25568" parentId="71"
value="A3-4"/>
<AesCivicAddressField changedOn="1232427886045" field="17" objectId="25567" parentId="71"
value="95134"/>
<AesCivicAddressField changedOn="1232427886045" field="18" objectId="25569" parentId="71"
value="SJ-19"/>
<AesCivicAddressField changedOn="1232427886045" field="21" objectId="25570" parentId="71"
value="Office"/>
<AesCivicAddressField changedOn="1232427886045" field="16" objectId="25571" parentId="71"
value="htamvada"/>
<AesCivicAddressField changedOn="1232427886045" field="22" objectId="25572" parentId="71"
value="Cisco Systems, Inc."/>
<AesCivicAddressField changedOn="1232427886045" field="1" objectId="25573" parentId="71"
value="US"/>
<AesCivicAddressField changedOn="1232427886045" field="2" objectId="25574" parentId="71"
value="CA"/>
</civicAddress>
</Location>
</Response>
</SOAP-ENV:Body>
```

11.9 METHOD: GetDeviceLocationBySerialNumber

Gets the location details of specific Wired Client by passing SerialNumber.

Result: Response containing Location object.

Arguments: SerialNumber as an attribute and AesBusinessSession as an element.

11.9.1 SOAP Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetDeviceLocationBySerialNumber SerialNumber=" CISCO12345678"
xmlns="http://cisco.com/mse/location">
<AesBusinessSession id="14766" mask="-1"/>
</GetDeviceLocationBySerialNumber>
</SOAP-ENV:Body>
```

11.9.2 SOAP Response

11.9.2.1 Success

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<Response xmlns="http://cisco.com/mse/location">
<Location changedOn="1232427886045" elin="00191991919191" objectId="71" parent="5"
parentId="69">
<civicAddress>
<AesCivicAddressField changedOn="1232427886045" field="11" objectId="25563" parentId="71"
```

```
value="560"/>
<AesCivicAddressField changedOn="1232427886045" field="15" objectId="25565" parentId="71"
value="1"/>
<AesCivicAddressField changedOn="1232427886045" field="4" objectId="25564" parentId="71"
value="San Jose"/>
<AesCivicAddressField changedOn="1232427886045" field="7" objectId="25566" parentId="71"
value="Cisco Way"/>
<AesCivicAddressField changedOn="1232427886045" field="25" objectId="25568" parentId="71"
value="A3-4"/>
<AesCivicAddressField changedOn="1232427886045" field="17" objectId="25567" parentId="71"
value="95134"/>
<AesCivicAddressField changedOn="1232427886045" field="18" objectId="25569" parentId="71"
value="SJ-19"/>
<AesCivicAddressField changedOn="1232427886045" field="21" objectId="25570" parentId="71"
value="Office"/>
<AesCivicAddressField changedOn="1232427886045" field="16" objectId="25571" parentId="71"
value="htamvada"/>
<AesCivicAddressField changedOn="1232427886045" field="22" objectId="25572" parentId="71"
value="Cisco Systems, Inc."/>
<AesCivicAddressField changedOn="1232427886045" field="1" objectId="25573" parentId="71"
value="US"/>
<AesCivicAddressField changedOn="1232427886045" field="2" objectId="25574" parentId="71"
value="CA"/>
</civicAddress>
</Location>
</Response>
</SOAP-ENV:Body>
```

11.10   METHOD: GetDeviceHistoryByMac

Gets the History details of specific Wired Client by passing MacAddress.

Result: Response containing Location object.

Arguments: MacAddress as an attribute and AesBusinessSession as an element.

11.10.1 SOAP Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetDeviceHistoryByMac MacAddress="00:19:56:85:c9:c1"
xmlns="http://cisco.com/mse/location">
<AesBusinessSession id="14766" mask="-1"/>
</GetDeviceHistoryByMac>
</SOAP-ENV:Body>
```

11.10.2 SOAP Response

11.10.2.1 Success

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<Responsexmlns="http://cisco.com/mse/types"><DeviceHistory changedOn="1235525861281"
from="1234921184833" macAddress="00:19:56:85:c9:c1" objectId="1" to="1235525861257">
<infoList>
<Device changedOn="1234921184844" identity="00:19:56:85:c9:c1" modelNum="cisco WS-C3560-
24PS" objectId="1" parentId="1" softwareVer="Cisco IOS Software, C3560 Software (C3560-
```

```
IPBASE-M), Version 12.2(25)SEE2, RELEASE SOFTWARE (fc1)&#xa;Copyright (c) 1986-2006 by
Cisco Systems, Inc.&#xa;Compiled Fri 28-Jul-06 07:19 by yenanh" type="1">
<epInterfaceList>
<WiredInterface changedOn="1234921184779" ipAddress="10.10.1.1"
macAddress="00:19:56:85:c9:c1" objectId="1" parentId="1" portNumber="3" portType="3"
slotNumber="1" state="1" switchIpAddress="-1408031902" type="1" username802Dot1x=""
vlanId="2">
<portAssocList><WiredPortAssociation moduleNumber="0" portId="0" portNumber="0"
portType="0" slotNumber="0" state="0" transitionTime="345224"/>
</portAssocList>
</WiredInterface>
</epInterfaceList>
</Device>

<Device changedOn="1235525861280" identity="00:19:56:85:c9:c1" modelNum="cisco WS-C3560-
24PS" objectId="57" parentId="1" softwareVer="Cisco IOS Software, C3560 Software (C3560-
IPBASE-M), Version 12.2(25)SEE2, RELEASE SOFTWARE (fc1)&#xa;Copyright (c) 1986-2006 by
Cisco Systems, Inc.&#xa;Compiled Fri 28-Jul-06 07:19 by yenanh" type="1">
<epInterfaceList>
<WiredInterface changedOn="1235525861245" ipAddress="10.10.1.1"
macAddress="00:19:56:85:c9:c1" objectId="57" parentId="57" portNumber="3" portType="3"
slotNumber="1" state="1" switchIpAddress="-1408031902" type="1" username802Dot1x=""
vlanId="2">
<portAssocList>
<WiredPortAssociation moduleNumber="0" portId="0" portNumber="0" portType="0"
slotNumber="0" state="0" transitionTime="605019661"/>
</portAssocList>
</WiredInterface>
</epInterfaceList>
</Device>
</infoList>
<locationList>
<Location changedOn="1234921184844" macAddress="00:19:56:85:c9:c1" objectId="1"
parentId="1"/>
<Location changedOn="1234924995590" macAddress="00:19:56:85:c9:c1" objectId="2"
parentId="1"/>
<Location changedOn="1234933457355" macAddress="00:19:56:85:c9:c1" objectId="3"
parentId="1"/><Location changedOn="1234935677818" macAddress="00:19:56:85:c9:c1"
objectId="4" parentId="1"/><Location changedOn="1234969723233"
macAddress="00:19:56:85:c9:c1" objectId="5" parentId="1"/><Location
changedOn="1234981112648" macAddress="00:19:56:85:c9:c1" objectId="6"
parentId="1"/><civicAddress><AesCivicAddressField field="18" value="SJ-
19"/><AesCivicAddressField field="16" value="Test User"/><AesCivicAddressField field="2"
value="California"/><AesCivicAddressField field="25" value="G3-4"/><AesCivicAddressField
field="15" value="3"/><AesCivicAddressField field="11"
value="2567"/><AesCivicAddressField field="7" value="Cisco Way"/><AesCivicAddressField
field="4" value="San Jose"/><AesCivicAddressField field="1"
value="US"/></civicAddress></Location><Location changedOn="1235525861280"
macAddress="00:19:56:85:c9:c1" objectId="57"
parentId="1"/></locationList></DeviceHistory></Response></SOAP-ENV:Body>
```

11.11   METHOD: GetWiredSwitchList

Gets the details of all wired switchs currently in the Service Engine.

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Result: Response containing WiredSwitch object.

Arguments: AesBusinessSession as an element.

11.11.1 SOAP Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetWiredSwitchList xmlns="http://cisco.com/mse/types">
<AesBusinessSession id="25072" mask="-1"/>
</GetWiredSwitchList>
</SOAP-ENV:Body>
```

11.11.2 SOAP Response

11.11.2.1 Success

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"><Response xmlns="
http://cisco.com/mse/types"><WiredSwitch changedOn="1232340883019" extendParentCivicData="true"
ipAddress="172.19.35.98" objectId="1"><device><Device type="5"><location><Location parent="4"/>
</location><epInterfaceList/></Device></device></WiredSwitch><WiredSwitch aesUId="2"
changedOn="1232346273482" extendParentCivicData="true" ipAddress="5.6.7.8"
macAddress="00:11:22:33:44:66" objectId="2"><portList><WiredSwitchPort
changedOn="1232346273501" extendParentCivicData="true" ipAddress="2.3.4.7" objectId="1"
parentId="2" portNumber="1500" slotNumber="3" useParentCivicData="false"><location><Location
changedOn="1232346273501" objectId="2" parent="5" parentId="1"><civicAddress>
<AesCivicAddressField changedOn="1232346273501" field="11" objectId="7" parentId="2"
value="8000"/><AesCivicAddressField changedOn="1232346273501" field="4" objectId="8"
parentId="2" value="Roseville"/><AesCivicAddressField changedOn="1232346273501" field="7"
objectId="9" parentId="2" value="Foothills"/><AesCivicAddressField changedOn="1232346273501"
field="19" objectId="10" parentId="2" value="R3L"/><AesCivicAddressField
changedOn="1232346273501" field="1" objectId="11" parentId="2" value="usa"/>
<AesCivicAddressField changedOn="1232346273502" field="2" objectId="12" parentId="2"
value="CA"/></civicAddress></Location></location></WiredSwitchPort><WiredSwitchPort
changedOn="1232346273516" extendParentCivicData="true" ipAddress="2.3.4.7" objectId="2"
parentId="2" portNumber="1501" slotNumber="4" useParentCivicData="false"><location><Location
changedOn="1232346273516" objectId="3" parent="5" parentId="2"><civicAddress>
<AesCivicAddressField changedOn="1232346273516" field="11" objectId="13" parentId="3"
value="8000"/><AesCivicAddressField changedOn="1232346273517" field="4" objectId="14"
parentId="3" value="Roseville"/><AesCivicAddressField changedOn="1232346273517" field="7"
objectId="15" parentId="3" value="Foothills"/><AesCivicAddressField changedOn="1232346273517"
field="19" objectId="16" parentId="3" value="R3L"/><AesCivicAddressField
changedOn="1232346273517" field="1" objectId="17" parentId="3" value="usa"/>
<AesCivicAddressField changedOn="1232346273517" field="2" objectId="18" parentId="3"
value="CA"/></civicAddress></Location></location></WiredSwitchPort></portList><device><Device
changedOn="1232346273483" identity="CISCODEVICE002" objectId="1" parentId="2"
serialNumber="CISCO12345678" type="5" udi="UniqueDI2"><location><Location
changedOn="1232346273487" objectId="1" parent="4" parentId="1"><civicAddress>
<AesCivicAddressField changedOn="1232346273491" field="11" objectId="1" parentId="1"
value="8000"/><AesCivicAddressField changedOn="1232346273491" field="4" objectId="2"
parentId="1" value="Roseville"/><AesCivicAddressField changedOn="1232346273491" field="7"
objectId="3" parentId="1" value="Foothills"/></civicAddress></Location></location>
<epInterfaceList><WiredInterface changedOn="1232346273484" ipAddress="2.3.4.5"
macAddress="00:11:22:33:44:77" objectId="1" parentId="1" type="1" username802Dot1x="admin"/>
<WiredInterface changedOn="1232346273484" ipAddress="2.3.4.6" macAddress="00:11:22:33:44:99"
objectId="2" parentId="1" type="1" username802Dot1x="admin2"/></epInterfaceList></Device>
</device></WiredSwitch></Response></SOAP-ENV:Body>
```

11.12   METHOD: GetWiredSwitch

Gets the details of particular wired switch currently in the Service Engine.

Result: Response containing WiredSwitch object.

Arguments: AesBusinessSession, IPAddress of the WiredSwitch.

11.12.1 SOAP Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetWiredSwitch xmlns="http://cisco.com/mse/types">
<AesBusinessSession id="25072" mask="-1"/>
<WiredSwitch extendParentCivicData="true" ipAddress="1.2.3.98"/>
</GetWiredSwitch>
</SOAP-ENV:Body>
```

11.12.2 SOAP Response

11.12.2.1 Success

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<Response xmlns="http://cisco.com/mse/types">
<WiredSwitch changedOn="1232340883019" extendParentCivicData="true" ipAddress="1.2.3.98"
objectId="1">
<device>
<Device type="5">
<location>
<Location parent="4"/>
</location>
<epInterfaceList/>
</Device>
</device>
</WiredSwitch>
</Response>
</SOAP-ENV:Body>
```

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CHAPTER 12

12 Asynchronous Notifications

MSE provides the capability of generating notifications based on a set of triggers that are matched against the tracked elements in the network. Events can be triggered for the following situations:

- Containment — In or out of a particular container such as a floor, building, coverage area or network design

- Movement — Movement greater than or less than a certain defined distance from a defined point.

- Absence — Absence beyond a certain time

- Battery Life (Applies only to Tags) — Low or normal battery life triggers

- Update — Whenever a location record is updated so long as the update is beyond a tolerance distance value since the last update

- Chokepoint — Each time a Tag encounters a ChokePoint

- Emergency —Each time a tag notifies the lbs of an emergency

Notifications can be sent using:

- SMTP Email

- SNMP Trap

- SOAP/XML

- Syslog

Triggers can be combined using logical AND/OR combinations to define complex triggers.

Each trigger defines a parameter that is matched on. The parameter can be as specific or general as required.

For example, a parameter can define a specific or wild-card version of:

- MAC address

- Asset Name

- Asset Group

- Asset Category

You should have a soap listener tool/program running on the client machine and should listen to localhost and the port number you have configured while registering these events through AddTrackGroup API call.

12.1 Definitions

12.1.1 Track Info

It defines the configuration and monitoring parameters for the tracking system.

- trackQueueLimit — Defines the event queue maintained in the server for pending events to be fired. Once the queue limit is reached, events will be dropped by the MSE. The number of dropped events is counted and is monitorable by reading trackEventsDropped.

- trackRateLimitInMsecs — Defines the time gap in milliseconds between events that should be kept for firing events out of the MSE. By default, 0, indicates fire the events as fast as they occur.

- refreshTimeInMins — The time period that must pass before events that have recurring triggers are fired. For example, if this parameter is set to 5 mins, but an event trigger would cause an event to fire every 30 secs then the event will be fired X times every 5 mins where X is retryCount + 1.

- retryCount — Defines the number of retries an event should be fired during a refresh period. Default is 1.

Class	AesTrackInfo

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Attribute	Type	Access
Name	String	RW
trackEventsDropped	long	RO
trackRateLimitInMsecs	int	RW
retryCount	int	RW
refreshTimeInMins	int	RW

12.1.2 **Track Group**

It defines a group of track definitions that can be added, updated or deleted from the MSE.

Class	AesTrackGroup		
	Attribute	**Type**	**Access**
	Name	**String**	**RW**
	defnList	List of AesTrackDefn	RW

12.1.3 **Track Definition**

It is the primary construct that defines what is tracked, what triggers an event and where that event is sent to.

- Each track definition has a priority (0 – being the highest priority) and is compared for triggers by the server in that priority order.

- Each track definition can be administratively disabled using the enabled attribute.

- Each track definition can be configured for hours of operations by defining the start and end times.

- Each track definition can send events to multiple destinations at the same time.

Class	AesTrackDefn		
	Attribute	**Type**	**Access**
	Name	String	RW

	Priority	int	RW
	dayMask	Int	RW
		0 = Mon	
		1 = Tues	
		2 = Weds	
		3 = Thu	
		4 = Fri	
		5 = Sat	
		6 = Sun	
	adminStatus	boolean	RW
	startHour	int	RW
	endHour	int	RW
	startMinute	int	RW
	endMinute	int	RW
	Trigger	AesTrigger	RW
	destDefnList	List of AesDestDefn	RW

12.1.4 **Destination Definition**

The definition of where an event can be sent and the transport mechanism to use. Each destination can be defined as PLAIN or XML text format for the messages sent to that destination.

Class	AesDestDefn		
	Attribute	**Type**	**Access**

destIPList	List of String	RW
msgFormat	Int MSG_FORMAT_XML = 0; MSG_FORMAT_PLAIN = 1;	RW
Transport	AesTransport	RW

12.1.5 **SMTP Transport**

The definition of SMTP parameters used when transporting an event over SMTP to a destination.

Class	AesTransportSMTP		
	Attribute	**Type**	**Access**
	Type	int	RW
	useAuth	boolean	RW
	authName	String	RW
	authPassword	String	RW
	Sender	String	RW
	Recipient	String	RW
	subjectPrefix	String	RW

12.1.6 **SNMP Transport**

The definition of SNMP parameters used when transporting an event over SNMP to a destination.

Class	AesTransportSNMP		
	Attribute	**Type**	**Access**
	portNumber	int	RW

	Community	String	RW

12.1.7 **SOAP Transport**

The definition of SOAP parameters used when transporting an event over SOAP to a destination.

Class	AesTransportSOAP		
	Attribute	**Type**	**Access**
	portNumber	int	RW
	useHTTPS	boolean	RW

12.1.8 **SysLog Transport**

The definition of Syslog parameters used when transporting an event over Syslog to a destination.

Class	AesTransportSysLog		
	Attribute	**Type**	**Access**
	portNumber	int	RW
	Priority	int	RW
	Facility	int	RW

12.1.9 **Trigger Movement**

A trigger that may fire an event based on movement from one of the following types:

- Marker — A named marker defined on a floor must be created before referring to it as part of the trigger. The reference is calculated based on the position of the marker itself.

- MAC Address — A mobile station or tag MAC address. The reference is calculated based on the position of the station or tag at the time of calculation.

- Reference Point — A user-defined point on a floor that is used as the reference point. As part of this type, the floor hierarchy must be defined that specifies the fully qualified name of the floor the point is defined on.

Distance is specified in "feet". Any conversion between meters and feet must be done by the application using the API.

Class	AesTriggerMovement		
	Attribute	**Type**	**Access**
	subTrigger	boolean	RW
	andTerm	boolean	RW
	andList	List of AesTrigger	RW
	orList	List of AesTrigger	RW
	Param	String	RW
	Operator	int	RW
	triggerType	int	RW
	triggerClass	int	RW
	Distance	float	RW
	Type	int	RW
	refX	float	RW
	refY	float	RW
	refFloorId	long	RW
	refParam	String	RW
	fireOn	int	RW
	refFloor	Object[]	RW

12.1.10 **Trigger Absence**

A trigger that may fire an event based on absence.

Class	AesTriggerAbsence		
	Attribute	**Type**	**Access**
	subTrigger	boolean	RW
	andTerm	boolean	RW
	andList	List of AesTrigger	RW
	orList	List of AesTrigger	RW
	Param	String	RW
	Operator	int	RW
	triggerType	int	RW
	triggerClass	int	RW
	timeInMins	int	RW

12.1.11 **Trigger Containment**

A trigger that may fire an event based on containment.

Class	AesTriggerContainment		
	Attribute	**Type**	**Access**
	subTrigger	boolean	RW
	andTerm	boolean	RW
	andList	List of AesTrigger	RW
	orList	List of AesTrigger	RW
	Param	String	RW

	Operator	int	RW
	triggerType	int	RW
	triggerClass	int	RW
	Container	Object[]	RW
	containerId	long	RW
	containerType	int	RW
	isIn	boolean	RW

12.1.12 **Trigger Battery Life**

A trigger that may fire an event based on a tag's battery life.

Class	AesTriggerBatteryLife		
	Attribute	**Type**	**Access**
	batteryStatusMask	Int MASK_LOW = 0x01; MASK_MEDIUM = 0x02; MASK_NORMAL = 0x04; MASK_ALL = MASK_LOW | MASK_MEDIUM | MASK_NORMAL;	RW
	subTrigger	boolean	RW
	andTerm	boolean	RW
	andList	List of AesTrigger	RW
	orList	List of AesTrigger	RW
	Param	String	RW
	Operator	int	RW
	triggerType	int	RW
	triggerClass	int	RW
	batteryStatus	Int MASK_LOW = 0x01; MASK_MEDIUM = 0x02; MASK_NORMAL = 0x04;	RW

		MASK_ALL = MASK_LOW | MASK_MEDIUM | MASK_NORMAL;	

12.1.13 **Trigger Update**

A trigger that may fire an event based on an updated location record so long as the update is beyond a certain distance tolerance.

Class	AesTriggerUpdate		
	Attribute	**Type**	**Access**
	subTrigger	boolean	RW
	andTerm	boolean	RW
	andList	List of AesTrigger	RW
	orList	List of AesTrigger	RW
	Param	String	RW
	Operator	int	RW
	triggerType	int	RW
	triggerClass	int	RW
	Distance	float	RW

12.1.14 **Trigger ChokePoint**

A trigger may fire an event when a Tag encounters a ChokePoint each time.

This trigger will be setup at any time a tag matching a given mac address pattern encounters a chokepoint with a mac from the chokepointMacList, an event will be fired by the LBS to that effect.

Alternatively, the chokepointMatchOperator and chokepointMacPattern can be populated and an event will be fired when a tag encounters a chokepoint whose macaddress matches the set up criteria.

Class	AesTriggerChokePoint		
	Attribute	**Type**	**Access**
	subTrigger	boolean	RW
	andTerm	boolean	RW
	andList	List of AesTrigger	RW
	orList	List of AesTrigger	RW
	Param	String	RW
	Operator	int	RW
	triggerType	int	RW
	triggerClass	int	RW
	chokepointMacList	List of String	RW
	chokepointMatchOperator	Int OP_EQ = 0; OP_LIKE = 1; OP_NOT_LIKE=2	RW
	chokepointMacPattern	String	RW

12.1.15 **Trigger Emergency**

A trigger that may fire an event based on each time a tag notifies the lbs of an emergency condition.

Class	AesTriggerEmergency		
	Attribute	**Type**	**Access**

	subTrigger	boolean	RW
	andTerm	boolean	RW
	andList	List of AesTrigger	RW
	orList	List of AesTrigger	RW
	Param	String	RW
	Operator	int	RW
	triggerType	int	RW
	triggerClass	int	RW
	conditionMask	int Options CONDITION_NONE=0x00 CONDITION_PANIC_BUTTON=0x01 CONDITION_DETACHED=0x02 CONDITION_TAMPERING=0x04 CONDITION_UNKNOWN=0x08 CONDITION_ALL = 0xff	RW
	emergencyMask	int Options CONDITION_NONE=0x00 CONDITION_PANIC_BUTTON=0x01 CONDITION_DETACHED=0x02 CONDITION_TAMPERING=0x04 CONDITION_UNKNOWN=0x08 CONDITION_ALL = 0xff	RW

12.1.16 **Generic Notification**

The user can turn this on for tags and it will be fired each time we hear a fresh tag beacon.

- entityEnabledMask — The entityEnabledMask can have the a bitmask consisting of any of the following values, as defined in the AesGenericNotificationDefs class :

ENTITY_NONE, ENTITY_TAG, ENTITY_ROGUE, ENTITY_CLIENT, ENTITY_ALL

- includeInfoMask — The infoIncludedMask is a bitmask consisting of one or more of :

INFO_NONE, INFO_LOCATION, INFO_BATTERY, INFO_EMERGENCY,
INFO_TELEMETRY, INFO_VENDOR, INFO_CHOKEPOINT, INFO_ALL

Class	AesGenericNotification		
	Attribute	**Type**	**Access**
	Enabled	boolean	RW
	entityEnabledMask	Integer ENTITY_NONE = 0; ENTITY_TAG = 1; Following two are currently not supported ENTITY_ROGUE = 2; ENTITY_CLIENT = 4;	RW
	includeInfoMask	Integer INFO_LOCATION = 1; INFO_BATTERY = 2; INFO_EMERGENCY = 4; INFO_TELEMETRY = 8; INFO_VENDOR = 16; INFO_CHOKEPOINT =32;	RW
	destDefnList	List of AesDestDefn	RW

12.2 Notifications

Notifications can be transmitted in plain or XML text as defined by the destination definition. This section describes only the XML schema for those notifications.

12.2.1 Containment Notification

12.2.1.1 Set

Element Name: ContainmentTrackEvent

Attribute	Description	Conditional Include

Attribute	Description	Conditional Include
state	Constant "set"	No
trackDefn	Name of the track definition	No
entityType	An enumeration of: • Mobile Station • Tag • Rogue AP • Rogue Client	No
entityID	MAC Address	No
in	If the entity is in or out of the container	No
containerType	An enumeration of: • Floor • Area • Network Design • Building	No
containerID	The container hierarchy	No

Example:

```
<ContainmentTrackEvent state="set" in="true" trackDefn="update2" floor="wcsArea,4th
Floor,Bldg-14,WNBU_Group,WNBU," entityType="Mobile Station"
entityID="00:0c:41:15:99:92"/>
```

12.2.1.2 Clear

Element Name: ContainmentTrackEvent

Attribute	Description	Conditional Include
state	Constant "clear"	No
trackDefn	Name of the track definition	No

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Attribute	Description	Conditional Include
entityType	An enumeration of: • Mobile Station • Tag • Rogue AP • Rogue Client	No
entityID	MAC Address	No

Example:

```
<ContainmentTrackEvent state="clear" trackDefn="update2" entityType="Mobile Station"
entityID="00:0c:41:15:99:92"/>
```

12.2.2 **Movement Notification**

12.2.2.1 Set

Element Name: MovementTrackEvent

Attribute	Description	Conditional Include
state	Constant "set"	No
trackDefn	Name of the track definition	No
entityType	An enumeration of: • Mobile Station • Tag • Rogue AP • Rogue Client	No
entityID	MAC Address	No
distance	The distance moved in feet	No
triggerDistance	The distance the trigger is set up for	No
reference	The reference parameter used for measuring distance from	Yes. If specified in the trigger.

Example:

```
<MovementTrackEvent state"set" distance="12.44" triggerDistance="4.0" trackDefn="update2"
reference="marker1" entityType="Mobile Station" entityID="00:0c:41:15:99:92"/>
```

12.2.2.2 Clear

Element Name: MovementTrackEvent

Attribute	Description	Conditional Include
state	Constant "clear"	No
trackDefn	Name of the track definition	No
entityType	An enumeration of: • Mobile Station • Tag • Rogue AP • Rogue Client	No
entityID	MAC Address	No

Example:

```
<MovementTrackEvent state="clear" trackDefn="update2" entityType="Mobile Station"
entityID="00:0c:41:15:99:92"/>
```

12.2.3 **Absence Notification**

12.2.3.1 Set

Element Name: AbsenceTrackEvent

Attribute	Description	Conditional Include
state	Constant "set"	No
trackDefn	Name of the track definition	No
entityType	An enumeration of: • Mobile Station	No

	• Tag	
	• Rogue AP	
	• Rogue Client	
entityID	MAC Address	No
missingFor	The time in seconds the entity has been missing	No
lastSeen	The time the entity was last seen	No

Example:

```
<AbsenceTrackEvent state="set" missingFor="34" lastSeen="15:00:20 28 Oct 2005"
trackDefn="absenceDef1" entityType="Mobile Station" entityID="00:0c:f1:53:9e:c0"/>
```

12.2.3.2 Clear

Element Name: AbsenceTrackEvent

Attribute	Description	Conditional Include
state	Constant "clear"	No
trackDefn	Name of the track definition	No
entityType	An enumeration of: • Mobile Station • Tag • Rogue AP • Rogue Client	No
entityID	MAC Address	No

Example:

```
<AbsenceTrackEvent state="clear" trackDefn="update2" entityType="Mobile Station"
entityID="00:0c:41:15:99:92"/>
```

12.2.4 **Battery Life Notification**

12.2.4.1 Set

Element Name: BatteryLifeTrackEvent

Attribute	Description	Conditional Include
state	Constant "set"	No
trackDefn	Name of the track definition	No
entityType	An enumeration of: • Tag	No
entityID	MAC Address	No
batteryStatus	Battery Status either: • High • Low	No
lastSeen	The time the entity was last seen	No

Example:

```
<BatteryLifeTrackEvent state="set" batteryStatus="low" lastSeen="15:00:20 28 Oct 2005"
trackDefn="absenceDef1" entityType="Tag" entityID="00:0c:f1:53:9e:c0"/>
```

12.2.4.2 Clear

Element Name: BatteryLifeTrackEvent

Attribute	Description	Conditional Include
state	Constant "clear"	No
trackDefn	Name of the track definition	No
entityType	An enumeration of: • Tag	No
entityID	MAC Address	No

Example:

```
<BatteryLifeTrackEvent state="clear" trackDefn="update2" entityType="Tag"
entityID="00:0c:41:15:99:92"/>
```

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12.2.5 **Update Notification**

12.2.5.1 Set

Element Name: UpdateTrackEvent

Attribute	Description	Conditional Include
state	Constant "set"	No
trackDefn	Name of the track definition	No
entityType	An enumeration of: • Mobile Station • Tag • Rogue AP • Rogue Client	No
entityID	MAC Address	No
X	X position on floor	No
Y	Y position on floor	No
Floor	The floor hierarchy	No
distance	Distance moved since last update	Yes. Only when the floor is the same as the last update.

Example:

```
<UpdateTrackEvent distance="115.73819627990147" x="60.0" y="120.0" trackDefn="update2"
floor="4th Floor,Bldg-14,WNBU_Group,WNBU," entityType="Mobile Station"
entityID="00:0c:41:15:99:92"/>
```

12.2.5.2 Clear

Element Name: UpdateTrackEvent

Attribute	Description	Conditional Include
state	Constant "clear"	No
trackDefn	Name of the track definition	No

Attribute	Description	Conditional Include
entityType	An enumeration of: • Mobile Station • Tag • Rogue AP • Rogue Client	No
entityID	MAC Address	No

Example:

```
<UpdateTrackEvent state="clear" trackDefn="update2" entityType="Mobile Station"
entityID="00:0c:41:15:99:92"/>
```

12.2.6 Emergency Notification

12.2.6.1 Set

Element Name: EmergencyTrackEvent

Attribute	Description	Conditional Include
state	Constant "set"	No
trackDefn	Name of the track definition	No
entityType	An enumeration of: • Tag	No
entityID	MAC Address	No
emergencyReason	Emergency Reason either: • panic button pressed • detached • tampering	No
lastSeen	The time the entity was last seen	No

Example:

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```
<EmergencyTrackEvent lastSeen="11:36:46 PST 18 Jan 2007" emergencyReason="detached"
trackDefn="emer" entityType="Tag" entityID="00:12:b8:00:20:50"/>
```
Note: *Emergency Events are never cleared by the LBS.*

12.2.7 **Chokepoint Notification**

12.2.7.1 Set

Element Name: ChokepointTrackEvent

Attribute	Description	Conditional Include
state	Constant "set"	No
trackDefn	Name of the track definition	No
entityType	An enumeration of: • Tag	No
entityID	MAC Address	No
chokepointName	Encountered chokepoint name	No
chokepointMac	Encountered chokepoint MacAddress	No
lastSeen	The time the entity was last seen	No

Example:

```
<ChokepointTrackEvent lastSeen="11:10:08 PST 18 Jan 2007" chokepointMac="00:0c:cc:
60:13:a3" chokepointName="chokeA3" trackDefn="choke" entityType="Tag"
entityID="00:12:b8:00:20:4f"/>
```

12.2.7.2 Clear

Element Name: ChokepointTrackEvent

Attribute	Description	Conditional Include
state	Constant "clear"	No
trackDefn	Name of the track definition	No
entityType	An enumeration of: • Tag	No
entityID	MAC Address	No

Example:

```
<ChokepointTrackEvent state="clear" entityType="Tag" trackDefn="choke"
entityID="00:12:b8:00:20:4f"/>
```

12.2.8   NorthboundNotification

The user can turn this on for tags and it will be fired each time we hear a fresh tag beacon.

Example:

```
<NorthboundNotificationEvent>
<AesTagLocation calcFloorId="1" calcX="-19.92" calcY="5.72" changedOn="1184023531457"
chokepointEncounterTime="0" confidenceFactor=" 656.0" floorId="1"
fullHierarchy="AesNetworkDesign:test|AesGroup:test_Group|AesBuilding:test|AesFloor:test-
floor" locationContributorMask="2" macAddress="00:0c:cc:5d:4c:67" minLastHeardSecs="-
2046493" objectId="88" simpleHierarchy="test>test>test-floor" size="4"
sourceTimestamp="1184023485089" x="- 19.92" y="5.72">
<floorHierarchy elem="test-floor"/>
<floorHierarchy elem="test"/>
<floorHierarchy elem="test_Group"/>
<floorHierarchy elem="test"/>
<info>
<AesTag changedOn="1184023483005" lastBeaconTime="0" macAddress="00:0c:cc:5d:4c:67"
objectId="123">
<batteryInfo>
<AesBatteryInfo lastReceivedTime="1184023531038" percentRemaining="80" tolerance="20"/>
</batteryInfo>
<telemetryList>
<AesTelemetry lastReceivedTime="1184023531038" measurementClass="
com.aes.datamodel.location.ctx.AesDefaultTelemMeasurement" type="MOTIONPROB">
<AesDefaultTelemMeasurement/>
</AesTelemetry>
</telemetryList>
</AesTag>
</info>
</AesTagLocation>
</NorthboundNotificationEvent>
```

12.2.8.1 Analysis of Northbound Notifications:

Northbound Notification Tag	Attributes	Value Example	Additional Information
AesTagLocation	calcFloorId	1	These are used in relation to chokepoint data. From 3.0.x.x we have been placing a tag on a chokepoint in a map if the tag sent us a chokepoint

	calcX	6.28	group (saying that it saw this chokepoint.) and we WOULD NOT CALCULATE location for it without RSSI at all.
	calcY	1.28	From 3.1.x.x onwards, whenever we get measurements from the controller we do two things, we calculate location for it and put it into calcX/calcY/calcZ/calcFloorId. Secondly, *if* with the measurements we also got a chokepoint group, we behave as in 3.0.x.x ie place the tag on the chokepoint (x=cp_x, y=cp_y etc) *if* there is NO chokepoint grp without these measurements and the location is calculated by rssi, we place the tag by rssi, if x=calc_x, y=calc_y etc.
	changedOn	1184023535493	changedOn attribute represents how recent the returned location is - do not take this in terms of when the db is updated etc., if the returned location is current then this will be the current time.
	chokepointEncounterTime		last chokepoint encounter

			time - Datatype : date
	confidenceFactor	264	Internal use : not to be used
	floorId	1	Mapped to Building Id of Network Design
	fullHierarchy	AesNetworkDesign:test|AesGroup:test_Group|AesBuilding:test|AesFloor:test-floor	It is of the format Design:name|Group:name|Building:name|Floor:name
	locationContributorMask	2	locationContributorMask can have values 1 or 2 value 1 – if the location was calculated based on a chokepoint value is 2 - then the location is based on RSSI
	macAddress	00:12:b8:00:20:4f	Tag Identifier
	minLastHeardSecs	0	Deprecated , Not to be used
	Objected	11	This id identifies the AesTagLocation Object uniquely
	simpleHierarchy	test>test>test-floor	Concatenation of the Campus name, Building name and the map name, separated by '>' sign.

	Size	4	Size represents the count of floorHierarchy . For the below elements size will be 4
			
			    \<floorHierarchy elem="floor1"/>
			
			    \<floorHierarchy elem="building1"/>
			
			    \<floorHierarchy elem="campus1_Group"/>
			
			    \<floorHierarchy elem="campus1" />
			
			Attribute FullHierarchy can also be used in alternate

	sourceTimestamp	1184023535493	The sourceTimestamp indicates when the location was last calculated
	X	6.28	The x-location always in float
	Y	1.28	The y-location always in float
AesTelemetry	lastReceivedTime	1184023535493	specifies the time of the Telemetry event
	measurementClass	com.aes.datamodel.location.ctx.AesDefaultTelemMeasurement	
	Type	TEMPERATURE	Valid values for the 'type' attribute are: GPS, TEMPERATURE, MOTION, DISTANCE, FUEL, QUANTITY, PRESSURE, HUMIDITY, STATUS, EPC, MOTIONPROB

	units	degrees Celsius	if(type="TEMPERATURE")
			
			   units="degrees Celsius"
			
			if(type="PRESSURE")
			
			   units="Pascal"
			
			if(type="MOTION")
			
			   units="meters/sec"
			
			if(type="DISTANCE")
			
			 units="meters"
			
			if(type="FUEL")
			
			 units="liters"
			
			if(type="HUMIDITY")
			
			 units="%"

	Mask	50	The corresponding telemetry type value is assigned to the mask attribute.
	Parented	java.lang.Float	The parentId determines the corresponding data type of the mask value.
AesEmergency	lastReceivedTime	1184023535493	time of the Emergency event
	Reason	2	Valid values are: REASON_PANIC_BUTTON = 0, REASON_DETACHED = 1, REASON_TAMPERING = 2, REASON_UNKNOWN = 3, REASON_PANIC_DETACHED = 4, REASON_PANIC_TAMPERING

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			= 5, REASON_TAMPERING_DETAC HED = 6
	tamperOpenedCount	3	the number of times the tag has been opened
	tamperState	1	Valid values are: TAMPER_STATE_INACTIVE = 0, TAMPER_STATE_ACTIVE = 1
	More Information on Emergency • Emergency list replaces the single AesEmergency object from concannon(3.0.x.x). We now store the last 5 distinct emergencies the tag encountered.The list is sorted from latest first to oldest last. • The emergencies received by the MSE in the last tag packet are marked "isActive = true".Older emergencies which are not currently reported by the tag but we store for history having isActive=false. • We always send emergency even if its location change.		

Note: *All track related requests are processed at **https://mse/location/** endpoint where mse represents the IP address of the MSE engine.*

12.3 Methods

12.3.1 **METHOD: GetTrackInfo**

Queries the track setup parameters currently stored in the MSE.

Result: AesTrackInfo.

Arguments: AesBusinessSession, AesQueryCriteria

12.3.1.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetTrackInfo xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
        </GetTrackInfo>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.1.2 SOAP Response

12.3.1.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
    <Response xmlns=" http://cisco.com/mse/location">
        <AesTrackInfo changedOn="1123801225125" objectId="1" trackEventsDropped="12"
trackQueueLimit="500" trackRateLimitInMsecs="2" retryCount="1" refreshTimeInMins="5">
        </AesTrackInfo>
    </Response>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.2   METHOD: SetTrackInfo

Sets the track setup parameters stored in the MSE.

Result: AesResult.

Arguments: AesBusinessSession, AesTrackInfo

12.3.2.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <SetTrackInfo xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesTrackInfo trackQueueLimit="500" trackRateLimitInMsecs="2" retryCount="1"
refreshTimeInMins="5">
            </AesTrackInfo>
        </SetTrackInfo>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.2.2 SOAP Response

12.3.2.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
    <Response xmlns=" http://cisco.com/mse/location">
        <AesResult result="true">
    </Response>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

The track groups are configured and monitored on the MSE using the following methods.

12.3.3 METHOD: GetTrackGroupInfoList

Queries a list of track groups currently stored in the MSE. The query can be:

- NULL - Return all track groups and their contents.

- Count Query - Return the number of track groups in the server

- All other queries (sorting, paging, member match and so on) - The list of track groups and their content, constrained based on the query content.

Result: See below.

Arguments: AesBusinessSession, AesQueryCriteria

12.3.3.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetTrackGroupInfoList xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
        </GetTrackGroupInfoList>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.3.2 SOAP Response

12.3.3.2.1 Success
```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
    <Response xmlns=" http://cisco.com/mse/location">
        <AesTrackGroup changedOn="1123801225125" name="group2" objectId="1">
            <defnList>
                <AesTrackDefn changedOn="1123801225125" enabled="true" name="defn3"
objectId="1" parentId="1">
                    <destDefnList>
                        <AesDestDefn changedOn="1123801225140" destIPList="127.0.0.1,"
objectId="1" parentId="1">
                            <transport>
                                <AesTransportSysLog changedOn="1123801225140"
facility="128" objectId="1" parentId="1" portNumber="514" priority="5"/>
                            </transport>
                        </AesDestDefn>
                    </destDefnList>
                    <trigger containerId="1">
                        <AesTriggerContainment changedOn="1123801225125" isIn="true"
objectId="1" param="00:05%" parentId="1"/>
                    </trigger>
                </AesTrackDefn>
            </defnList>
        </AesTrackGroup>
    </Response></SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.4 **METHOD: GetTrackGroupInfo**

Returns an AesTrackGroup currently stored in the MSE based on various search criteria.

Result: An AesTrackGroup object or null if not found.

Arguments: AesBusinessSession, AesTrackGroup Key

12.3.4.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <GetTrackGroupInfo xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesTrackGroup name="trackGrp1"/>
        </GetTrackGroupInfo>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.4.2 SOAP Response

12.3.4.2.1 Success

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
    <Response xmlns=" http://cisco.com/mse/location">
        <AesTrackGroup changedOn="1123801225125" name="group2" objectId="1">
            <defnList>
                <AesTrackDefn changedOn="1123801225125" enabled="true" name="defn3"
objectId="1" parentId="1">
                    <destDefnList>
                        <AesDestDefn changedOn="1123801225140" destIPList="127.0.0.1,"
objectId="1" parentId="1">
                            <transport>
                                <AesTransportSysLog changedOn="1123801225140"
facility="128" objectId="1" parentId="1" portNumber="514" priority="5"/>
                            </transport>
                        </AesDestDefn>
                    </destDefnList>
                    <trigger containerId="1">
                        <AesTriggerContainment changedOn="1123801225125" isIn="true"
objectId="1" param="00:05%" parentId="1"/>
                    </trigger>
                </AesTrackDefn>
            </defnList>
        </AesTrackGroup>
    </Response>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.5 METHOD: AddTrackGroup

Adds a track group to the MSE.

Result: An AesResult object specify the success or failure of the operation

Arguments: AesBusinessSession, AesTrackGroup object containing the information

12.3.5.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <AddTrackGroup xmlns=" http://cisco.com/mse/location">
```

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```
                    <AesBusinessSession id="10510"/>
                    <AesTrackGroup name="group2">
                    <defnList>
                        <AesTrackDefn enabled="true" name="defn3">
                            <destDefnList>
                                <AesDestDefn destIPList="127.0.0.1,">
                                    <transport>
                        <AesTransportSysLog facility="128" portNumber="514" priority="5"/>
                                    </transport>
                                </AesDestDefn>
                            </destDefnList>
                            <trigger containerId="1">
                                <AesTriggerContainment isIn="true" param="00:05%"/>
                            </trigger>
                        </AesTrackDefn>
                    </defnList>
                    </AesTrackGroup>
                </AddTrackGroup>
        </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.5.2 SOAP Response

12.3.5.2.1 Success
```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesResult result="true"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.6 **METHOD: ModifyTrackGroup**

Modifies the track group information. This will completely replace all content on the MSE for this track group. Any objects requiring deletion will automatically take place.

Result: An AesResult object specifying the success or failure of the operation.

Arguments: AesBusinessSession, AesTrackGroup object containing measurements and so on.

12.3.6.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <ModifyTrackGroup xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesTrackGroup name="group2">
            <defnList>
                <AesTrackDefn enabled="true" name="defn3">
                    <destDefnList>
                        <AesDestDefn destIPList="127.0.0.1,">
                            <transport>
                <AesTransportSysLog facility="128" portNumber="514" priority="5"/>
                            </transport>
                        </AesDestDefn>
                    </destDefnList>
                    <trigger containerId="1">
                        <AesTriggerContainment isIn="true" param="00:05%"/>
                    </trigger>
                </AesTrackDefn>
```

```
            </defnList>
          </AesTrackGroup>
        </ModifyTrackGroup>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.6.2 SOAP Response

12.3.6.2.1 Success
```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesResult result="true"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.7 METHOD: DeleteTrackGroup

Deletes all track group information including all other related information for that track group.

Result: An AesResult object specifying the success or failure of the operation.

Arguments: AesBusinessSession, AesTrackGroup Key

12.3.7.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <DeleteTrackGroup xmlns=" http://cisco.com/mse/location">
            <AesBusinessSession id="10510"/>
            <AesTrackGroup name="trackGrp1"/>
        </DeleteTrackGroup>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.7.2 SOAP Response

12.3.7.2.1 Success
```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Body>
        <Response xmlns=" http://cisco.com/mse/location">
            <AesResult result="true"/>
        </Response>
    </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.8 **METHOD: GetGenericNotification**

Gets the Generic Notification information from the Location Server.

Result: An AesGenericNotification object or null if not found.

Arguments: AesBusinessSession.

12.3.8.1 Soap Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
 <SOAP-ENV:Body>
        <GetGenericNotification xmlns=" http://cisco.com/mse/location">
             <AesBusinessSession id="19382"/>
      </GetGenericNotification>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.8.2 Soap Response

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope"/>

<SOAP-ENV:Body>

  <Response xmlns=" http://cisco.com/mse/location">
<AesGenericNotification changedOn="1184023526619" enabled="true"  entityEnabledMask="1"
includeInfoMask="63" objectId="1">
<destDefnList>
<AesDestDefn changedOn="1184064878075" destIPList="171.71.132.138,"  objectId="9"
parentId="1">
<transport>
<AesTransportSNMP changedOn="1184064878076" community="public" objectId="9" parentId="9"
portNumber="162"/>

                </transport>

             </AesDestDefn>

         </destDefnList>

     </AesGenericNotification>

  </Response>

</SOAP-ENV:Body>

</SOAP-ENV:Envelope>
```

12.3.9 **METHOD: SetGenericNotification**

Deprecated and replaced by AddGenericNotification API

Sets the Generic Notification information to the Location Server.

Result: An AesResult object or null if not found.

Arguments: AesBusinessSession, AesGenericNotification.

12.3.9.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">

<SOAP-ENV:Body>

   <SetGenericNotification xmlns=" http://cisco.com/mse/location">

        <AesBusinessSession id="19382"/>

        <AesGenericNotification changedOn="1184023526619" enabled="true"
entityEnabledMask="1"                     includeInfoMask="63" objectId="1">

           <destDefnList>

             <AesDestDefn changedOn="1184064878075" destIPList="171.71.132.138,"
objectId="9"  parentId="1">

                 <transport>

                    <AesTransportSNMP changedOn="1184064878076" community="public"
objectId="9" parentId="9" portNumber="162"/>

                 </transport>

              </AesDestDefn>

           </destDefnList>

        </AesGenericNotification>

    </SetGenericNotification>

</SOAP-ENV:Body>

</SOAP-ENV:Envelope>
```

12.3.9.2 SOAP Response

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">

<SOAP-ENV:Body>

  <Response xmlns=" http://cisco.com/mse/location">

    <AesResult result="true"/>

  </Response>

</SOAP-ENV:Body>

</SOAP-ENV:Envelope>
```

12.3.10 **METHOD: GetGenericNotificationList**

Gets the list of generic northbound notifications from the MSE.

Result: A collection of generic northbound notifications

Arguments: AesBusinessSession

12.3.10.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
 <SOAP-ENV:Body>
        <GetGenericNotificationList xmlns=" http://cisco.com/mse/location">
             <AesBusinessSession id="19382"/>
      </GetGenericNotificationList>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.10.2 SOAP Response

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope"/>

<SOAP-ENV:Body>

  <Response xmlns=" http://cisco.com/mse/location">
       <AesGenericNotification changedOn="1329519787860" enabled="true"
entityEnabledMask="1" includeInfoMask="14" notificationName="tag-notification"
objectId="3" triggerConditionMask="63">

       <destDefnList>

       <AesDestDefn adminStatus="1" changedOn="1329519787860" destIPList="10.35.70.253,"
objectId="9790" parentId="3">

       <transport>

       <AesTransportSOAP changedOn="1329519787860" objectId="3" parentId="9790"
portNumber="8003" useHTTPS="true"/>

       </transport>

       </AesDestDefn>

       </destDefnList>
```

```
          </AesGenericNotification>

          <AesGenericNotification changedOn="1329519432306" enabled="true"
entityEnabledMask="4" includeInfoMask="65"   notificationName="client-notification"
objectId="2" triggerConditionMask="257">

          <destDefnList>

          <AesDestDefn adminStatus="1" changedOn="1329519432306" destIPList="172.19.28.207,"
objectId="9786" parentId="2">

          <transport>

          <AesTransportSOAP changedOn="1329519432306" objectId="2" parentId="9786"
portNumber="8003" useHTTPS="true"/>

          </transport>

          </AesDestDefn>

          </destDefnList>

          </AesGenericNotification>

    </Response>

</SOAP-ENV:Body>

</SOAP-ENV:Envelope>
```

12.3.11 METHOD: AddGenericNotification

Add a Generic Northbound Notification to the Location Server. This API replaces existing setGenericNotification API.

Result: An AesResult object or null if not found.

Arguments: AesBusinessSession, AesGenericNotification.

12.3.11.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
 <SOAP-ENV:Body>
   <AddGenericNotification xmlns="http://cisco.com/mse/types">

          <AesBusinessSession id="23827" mask="-1"/>

          <AesGenericNotification enabled="true" entityEnabledMask="1" includeInfoMask="14"
notificationName="tag-notification-1" triggerConditionMask="63">

          <destDefnList>
```

```
             <AesDestDefn adminStatus="1" destIPList="10.35.70.253,">

             <transport>

             <AesTransportSOAP portNumber="8003" useHTTPS="true"/>

             </transport>

             </AesDestDefn>

             </destDefnList>

             </AesGenericNotification>

    </AddGenericNotification>
 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.11.2 SOAP Response

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope"/>

<SOAP-ENV:Body>

  <Response xmlns=" http://cisco.com/mse/location">
       <AesResult result="true"/>

  </Response>

</SOAP-ENV:Body>

</SOAP-ENV:Envelope>
```

12.3.12 **METHOD: GetGenericNotificationByName**

Gets the details of specific Generic Northbound Notification by passing its name.

Result: Response containing AesGenericNotification.

Arguments: Name as a String attribute and AesBusinessSession as an element.

12.3.12.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
 <SOAP-ENV:Body>

       <GetGenericNotificationByName NotificationName="tag-notification"
xmlns="http://cisco.com/mse/types">
```

```
            <AesBusinessSession id="23827" mask="-1"/>

        </GetGenericNotificationByName>

 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.12.2 SOAP Response

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope"/>

<SOAP-ENV:Body>

  <Response xmlns=" http://cisco.com/mse/location">
        <AesGenericNotification changedOn="1329519787860" enabled="true"
entityEnabledMask="1" includeInfoMask="14" notificationName="tag-notification"
objectId="3" triggerConditionMask="63">

        <destDefnList>

        <AesDestDefn adminStatus="1" changedOn="1329519787860" destIPList="10.35.70.253,"
objectId="9790" parentId="3">

        <transport>

        <AesTransportSOAP changedOn="1329519787860" objectId="3" parentId="9790"
portNumber="8003" useHTTPS="true"/>

        </transport>

        </AesDestDefn>

        </destDefnList>

        </AesGenericNotification>

  </Response>

</SOAP-ENV:Body>

</SOAP-ENV:Envelope>
```

12.3.13 **METHOD: DeleteGenericNotification**

Deletes a specific Generic Northbound Notification.

Result: An AesResult object or null if not found.

Arguments: AesGenericNotification with mandatory name and AesBusinessSession as an element.

12.3.13.1 SOAP Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
 <SOAP-ENV:Body>

        <DeleteGenericNotification xmlns="http://cisco.com/mse/types">

        <AesBusinessSession id="23827" mask="-1"/>

        <AesGenericNotification notificationName="tag-notification-1"
triggerConditionMask="0"/>

        </DeleteGenericNotification>

 </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.3.13.2 SOAP Response

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope"/>

<SOAP-ENV:Body>

  <Response xmlns=" http://cisco.com/mse/location">
        <AesResult result="true" resultArg="4" resultArgClass="java.lang.Long"/>

  </Response>

</SOAP-ENV:Body>

</SOAP-ENV:Envelope>
```

CHAPTER 13

₁₃ Examples

The following are some examples of queries using different criteria's, they are represented in pseudo-code.

13.1 Query Samples

A) Query to get the full list of mobile station locations updated in last 5 minutes.

AesMatchMbrCriteria.operator = OP_LT_EQ

AesMatchMbrCriteria.matchMbr = AesObject.CHANGED_ON_DELTA

AesMatchMbrCriteria.matchClass = AesMobileStationLocation.CLASSNAME

AesMatchMbrCriteria.matchValue = new Integer(5)

AesQueryCriteria.and(AesMatchMbrCriteria)

AesQueryCriteria.numOfResults(ALL_RESULTS)

AesQueryCriteria.options(OPT_FULL)

Xml Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <GetStationLocationList xmlns=" http://cisco.com/mse/location">
        <AesBusinessSession id="18740" mask="-1"/>
 <AesQueryCriteria numOfResults="-1">
  <and-list>
 <AesMatchMbrCriteria matchClass="AesMobileStationLocation" matchMbr="changedOn"
matchValue="300000" operator="1" valueClass="java.lang.Long"/>
</and-list>
        </AesQueryCriteria>
```

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```
        </ GetStationLocationList>
</SOAP-ENV:Body>
```

B) Query to get a list of mobile station locations updated in last 5 minutes only returning the first 20 as a page

AesMatchMbrCriteria.operator = OP_LT_EQ

AesMatchMbrCriteria.matchMbr = AesObject.CHANGED_ON_DELTA

AesMatchMbrCriteria.matchClass = AesMobileStationLocation.CLASSNAME

AesMatchMbrCriteria.matchValue = new Integer(5)

AesQueryCriteria.and(AesMatchMbrCriteria)

AesQueryCriteria.numOfResults(20)

AesQueryCriteria.startIndex(0)

AesQueryCriteria.options(OPT_FULL)

Xml Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
     <GetStationLocationList xmlns=" http://cisco.com/mse/location">
         <AesBusinessSession id="18740" mask="-1"/>
 <AesQueryCriteria numOfResults="20">
  <and-list>
 <AesMatchMbrCriteria matchClass="AesMobileStationLocation" matchMbr="changedOn"
matchValue="300000" operator="1" valueClass="java.lang.Long"/>
</and-list>
         </AesQueryCriteria>
    </ GetStationLocationList>
</SOAP-ENV:Body>
```

And query for the next 20…

AesQueryCriteria.and(AesMatchMbrCriteria)

AesQueryCriteria.numOfResults(20)

AesQueryCriteria.startIndex(20)

AesQueryCriteria.options(OPT_FULL)

Xml Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
     <GetStationLocationList xmlns=" http://cisco.com/mse/location">
         <AesBusinessSession id="18740" mask="-1"/>
 <AesQueryCriteria numOfResults="20" startIndex="20">
  <and-list>
 <AesMatchMbrCriteria matchClass="AesMobileStationLocation" matchMbr="changedOn"
matchValue="300000" operator="1" valueClass="java.lang.Long"/>
</and-list>
         </AesQueryCriteria>
    </ GetStationLocationList>
```

```
</SOAP-ENV:Body>
```

C) Query to get a list of mobile station locations updated in last 5 minutes only returning the first 20 as a page, with only location data, not the full information object.

AesMatchMbrCriteria.operator = OP_LT_EQ

AesMatchMbrCriteria.matchMbr = AesObject.CHANGED_ON_DELTA

AesMatchMbrCriteria.matchClass = AesMobileStationLocation.CLASSNAME

AesMatchMbrCriteria.matchValue = new Integer(5)

AesQueryCriteria.and(AesMatchMbrCriteria)

AesQueryCriteria.numOfResults(20)

AesQueryCriteria.startIndex(0)

AesQueryCriteria.options(**OPT_MIN**)

Xml Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <GetStationLocationList xmlns=" http://cisco.com/mse/location">
        <AesBusinessSession id="18740" mask="-1"/>
 <AesQueryCriteria numOfResults="20" options="2">
  <and-list>
 <AesMatchMbrCriteria matchClass="AesMobileStationLocation" matchMbr="changedOn"
matchValue="300000" valueClass="java.lang.Long"/>
</and-list>
        </AesQueryCriteria>
   </ GetStationLocationList>
</SOAP-ENV:Body>
```

D) Get a specific mobile station with MAC Address "00:01:02:03:04:05"

AesMatchMbrCriteria.operator = OP_EQ

AesMatchMbrCriteria.matchMbr = AesMobileStation.MAC_ADDRESS

AesMatchMbrCriteria.matchClass = AesMobileStation.CLASSNAME

AesMatchMbrCriteria.matchValue = "00:01:02:03:04:05"

AesQueryCriteria.and(AesMatchMbrCriteria)

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AesQueryCriteria.numOfResults(ALL_RESULTS)

AesQueryCriteria.options(OPT_MIN)

Xml Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
     <GetStationLocationList xmlns=" http://cisco.com/mse/location">
        <AesBusinessSession id="18740" mask="-1"/>
 <AesQueryCriteria numOfResults="20" options="2">
  <and-list>
<AesMatchMbrCriteria matchClass="AesMobileStationLocation" matchMbr="macAddress"
matchValue="00:01:02:03:04:05" valueClass="java.lang.String"/>
</and-list>
        </AesQueryCriteria>
   </ GetStationLocationList>
</SOAP-ENV:Body>
```

E) Get the full list of mobile stations with MAC Address prefix "00:01"

AesMatchMbrCriteria.operator = OP_LIKE

AesMatchMbrCriteria.matchMbr = AesMobileStation.MAC_ADDRESS

AesMatchMbrCriteria.matchClass = AesMobileStation.CLASSNAME

AesMatchMbrCriteria.matchValue = "00:01"

AesQueryCriteria.and(AesMatchMbrCriteria)

AesQueryCriteria.numOfResults(ALL_RESULTS)

AesQueryCriteria.options(OPT_MIN)

Xml Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
     <GetStationLocationList xmlns=" http://cisco.com/mse/location">
        <AesBusinessSession id="18740" mask="-1"/>
 <AesQueryCriteria numOfResults="20" options="2">
  <and-list>
<AesMatchMbrCriteria matchClass="AesMobileStationLocation" matchMbr="macAddress"
matchValue="00:01" operator="5"    valueClass="java.lang.String"/>
</and-list>
        </AesQueryCriteria>
   </ GetStationLocationList>
</SOAP-ENV:Body>
```

F) Get the full list of mobile stations with asset category prefix "eng-"

AesMatchMbrCriteria.operator = OP_LIKE

AesMatchMbrCriteria.matchMbr = AesMobileStation.ASSET_CATEGORY

AesMatchMbrCriteria.matchClass = AesMobileStation.CLASSNAME

AesMatchMbrCriteria.matchValue = "eng-"

AesQueryCriteria.and(AesMatchMbrCriteria)

AesQueryCriteria.numOfResults(ALL_RESULTS)

AesQueryCriteria.options(OPT_MIN)

Xml Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <GetStationLocationList xmlns=" http://cisco.com/mse/location">
        <AesBusinessSession id="18740" mask="-1"/>
 <AesQueryCriteria numOfResults="20" options="2">
  <and-list>
<AesMatchMbrCriteria matchClass="AesMobileStationS" matchMbr="asset" matchValue="eng-"
operator="5"    valueClass="java.lang.String"/>
</and-list>
        </AesQueryCriteria>
   </ GetStationLocationList>
</SOAP-ENV:Body>
```

G) Get the full list of mobile station locations updated in last 5 minutes WITHIN A PARTICULAR COVERAGE AREA

AesMatchMbrCriteria.operator = OP_LT_EQ

AesMatchMbrCriteria.matchMbr = AesObject.CHANGED_ON_DELTA

AesMatchMbrCriteria.matchClass = AesMobileStationLocation.CLASSNAME

AesMatchMbrCriteria.matchValue = new Integer(5)

Object[] area1Hierarchy = new Object[] { "area1", "floor1", "building1", "campus1" };

AesQueryCriteria.addContainer(AesCoverageArea.CLASS_NAME, area1Hierarchy);

AesQueryCriteria.and(AesMatchMbrCriteria)

AesQueryCriteria.numOfResults(ALL_RESULTS)

AesQueryCriteria.options(OPT_FULL)

Xml Request

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```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">

<GetStationLocationList xmlns=" http://cisco.com/mse/location">
  <AesBusinessSession id="18740" mask="-1"/>

  <AesQueryCriteria numOfResults="-1" options="2">
      <and-list>
<AesMatchMbrCriteria matchClass="AesMobileStationLocation" matchMbr="changedOn"
matchValue="5" operator="4" valueClass="java.lang.Integer"/>
    </and-list>
   <containList>
    <containEl containCl="AesCoverageArea" size="4">
       <hierEl val="area1"/><hierEl val="floor1"/>
       <hierEl val="building1"/><hierEl val="campus1"/>
    </containEl>
   </containList>
</AesQueryCriteria>
 </ GetStationLocationList>
</SOAP-ENV:Body>
```

H) Get the full list of mobile station locations updated in last 5 minutes WITHIN a Set of Floors

AesMatchMbrCriteria.operator = OP_LT_EQ

AesMatchMbrCriteria.matchMbr = AesObject.CHANGED_ON_DELTA

AesMatchMbrCriteria.matchClass = AesMobileStationLocation.CLASSNAME

AesMatchMbrCriteria.matchValue = new Integer(5)

Object[] floor1Hierarchy = new Object[] {   "floor1", "building1", "campus1" };

Object[] floor2Hierarchy = new Object[] {   "floor2", "building1", "campus1" };

AesQueryCriteria.addContainer(AesFloor.CLASS_NAME, floor1Hierarchy);

AesQueryCriteria.addContainer(AesFloor.CLASS_NAME, floor2Hierarchy);

AesQueryCriteria.and(AesMatchMbrCriteria)

AesQueryCriteria.numOfResults(ALL_RESULTS)

AesQueryCriteria.options(OPT_FULL)

XML Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetStationLocationList xmlns=" http://cisco.com/mse/location">
  <AesBusinessSession id="18740" mask="-1"/>
  <AesQueryCriteria numOfResults="-1" options="2">
      <and-list>
<AesMatchMbrCriteria matchClass="AesMobileStationLocation" matchMbr="changedOn"
matchValue="5" operator="4" valueClass="java.lang.Integer"/>
      </and-list>
      <containList>
```

```
            <containEl containCl="AesFloor" size="3">
<hierEl val="floor1"/>
<hierEl val="building1"/>
<hierEl val="campus1"/>
            </containEl>
            <containEl containCl="AesFloor" size="3">
<hierEl val="floor2"/>
<hierEl val="building1"/>
<hierEl val="campus1"/>
            </containEl>
        </containList>
    </AesQueryCriteria>
 </ GetStationLocationList>
</SOAP-ENV:Body>
```

I) Get the full list of mobile station locations updated in last 5 minutes WITHIN a PARTICULAR Building.

AesMatchMbrCriteria.operator = OP_LT_EQ

AesMatchMbrCriteria.matchMbr = AesObject.CHANGED_ON_DELTA

AesMatchMbrCriteria.matchClass = AesMobileStationLocation.CLASSNAME

AesMatchMbrCriteria.matchValue = new Integer(5)

Object[] buildingHierarchy = new Object[] {   "building1", "campus1" };

AesQueryCriteria.addContainer(AesBuilding.CLASS_NAME, buildingHierarchy);

AesQueryCriteria.and(AesMatchMbrCriteria)

AesQueryCriteria.numOfResults(ALL_RESULTS)

AesQueryCriteria.options(OPT_FULL)

Xml Request

```
<SOAP-ENV:Body xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<GetStationLocationList xmlns=" http://cisco.com/mse/location">
  <AesBusinessSession id="18740" mask="-1"/>
  <AesQueryCriteria numOfResults="-1" options="2">
     <and-list>
<AesMatchMbrCriteria matchClass="AesMobileStationLocation" matchMbr="changedOn"
matchValue="5" operator="4" valueClass="java.lang.Integer"/>
      </and-list>
      <containList>
<containEl containCl="AesBuilding" size="2">
  <hierEl val="building1"/>
  <hierEl val="campus1"/>
</containEl>
      </containList>
```

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```
        </AesQueryCriteria>
 </ GetStationLocationList>
</SOAP-ENV:Body>
```

J)   Get the full list of Tags which has the Telemetry field of GPS Latitude less than 90.

AesTelemetryCriteria.operator = AesTelemetryCriteria.TelemField.GPS_LAT

AesTelemetryCriteria.telemField = AesTelemetryCriteria.Operator.LESS_THAN

AesTelemetryCriteria.telemValue= new Double(90)

AesQueryCriteria.and(AesTelemetryCriteria)

AesQueryCriteria.numOfResults(ALL_RESULTS)

AesQueryCriteria.options(OPT_FULL)

Xml Request

```
<SOAP-ENV:Body >
        <GetTagLocationList xmlns=" http://cisco.com/mse/location">
<AesBusinessSession id="3834" mask="-1"/>
<AesQueryCriteria numOfResults="-1">
            <and-list>
<AesTelemetryCriteria operator="&lt;" telemField="GPS_LAT" telemValue="90.0"
valueClass="java.lang.Double"/>
            </and-list>
</AesQueryCriteria>
        </GetTagLocationList>
</SOAP-ENV:Body>
```

K)   Get the full list of mobile station Locations with IP Address

AesQueryCriteria qc = new AesQueryCriteria();

AesMatchColumnCriteria mc = new AesMatchColumnCriteria();
mc.setTableName1(AesMobileStationLocation.CLASSNAME);
mc.setFieldName1(AesMobileStationLocation.MAC_ADDRESS);
mc.setTableName2(AesMobileStation.CLASSNAME);
mc.setFieldName2(AesMobileStation.MAC_ADDRESS);

AesMatchMbrCriteria m1 = new AesMatchMbrCriteria();
m1.setMatchMbr(AesMobileStation.IP_ADDR);
m1.setMatchClass(AesMobileStation.CLASSNAME);
m1.setMatchValue("40.40.1.25"); // specify the ip address to match on
m1.setOperator(AesMatchMbrCriteria.OP_EQ);
m1.setOptions(AesObject.OPT_FULL);
qc.and(mc);qc.and(m1);

Xml Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
  <GetStationLocationList xmlns=" http://cisco.com/mse/location">
   <AesBusinessSession id="21854" mask="-1"/>
   <AesQueryCriteria>
     <and-list>
<AesMatchColumnCriteria fieldName1="macAddress" fieldName2="macAddress"
tableName1="AesMobileStationLocation" tableName2="AesMobileStation"/>
<AesMatchMbrCriteria matchClass="AesMobileStation" matchMbr="ipAddress"
matchValue="172.20.226.175" valueClass="java.lang.String"/>
      </and-list>
   </AesQueryCriteria>
  </GetStationLocationList>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

13.2 Asynchronous Notification Samples

You should have a soap listener tool/program running on the client machine and should listen to localhost and the port number you have configured while registering these events through AddTrackGroup API call.

13.2.1 Containment Notification

Notification if available in a particular container such as a floor, building, coverage area or network design.

Xml Request

```
<SOAP-ENV:Body>
<AddTrackGroup>
     <AesBusinessSession id="2397" mask="-1"/>
     <AesTrackGroup name="SEETHATEST">
        <defnList>
<AesTrackDefn name="SEETHA">
   <destDefnList>
       <AesDestDefn destIPList="10.77.152.14,">
         <transport>
<AesTransportSNMP community="public" portNumber="162"/>
        </transport>
     </AesDestDefn>
                 </destDefnList>
     <trigger>
        <AesTriggerContainment containerSize="4" isIn="true" operator="1" param="00:">
<container element="HCL-2"/>
<container element="HCL-2_Group"/>
<container element="hclbuild1"/>
<container element="floor1"/>
       </AesTriggerContainment>
              </trigger>
 </AesTrackDefn>
       </defnList>
    </AesTrackGroup>
```

```
    </AddTrackGroup>
</SOAP-ENV:Body>
```

13.2.2 **Movement Notification**

Movement greater than or less than a certain defined distance from a predefined marker point within a floor.

Xml Request

```
<SOAP-ENV:Body>
<AddTrackGroup>
    <AesBusinessSession id="2397" mask="-1"/>
    <AesTrackGroup name="AbsenceTest">
        <defnList>
    <AesTrackDefn name="absenceTest">
     <destDefnList>
        <AesDestDefn destIPList="10.77.152.14,">
<transport>
    <AesTransportSNMP community="public" portNumber="162"/>
  </transport>
</AesDestDefn>
        </destDefnList>
      <trigger>
<AesTriggerMovement distance="20.0" param="00:05:4e:4b:ae:7a"   refParam="marker-name1"/>
</trigger>
</AesTrackDefn>
        </defnList>
        </AesTrackGroup>
</AddTrackGroup>
</SOAP-ENV:Body>
```

13.2.3 **Absence Notification**

Absence beyond a certain time.

Xml Request

```
<SOAP-ENV:Body>
<AddTrackGroup>
    <AesBusinessSession id="2397" mask="-1"/>
    <AesTrackGroup name="AbsenceTest">
        <defnList>
    <AesTrackDefn name="absenceTest">
     <destDefnList>
        <AesDestDefn destIPList="10.77.152.14,">
<transport>
    <AesTransportSNMP community="public" portNumber="162"/>
  </transport>
</AesDestDefn>
        </destDefnList>
        <trigger>
<AesTriggerAbsence param="00:00:00:00:00:eb" timeInMins="60"/>
        </trigger>
</AesTrackDefn>
        </defnList>
        </AesTrackGroup>
</AddTrackGroup>
</SOAP-ENV:Body>
```

13.2.4 **Battery life Notification**

Low or normal battery life triggers

Xml Request

```
<SOAP-ENV:Body>
<AddTrackGroup>
     <AesBusinessSession id="2397" mask="-1"/>
     <AesTrackGroup name="BateryLifeTest">
        <defnList>
           <AesTrackDefn name="bateryTest">
     <destDefnList>
          <AesDestDefn destIPList="10.77.152.14,">
<transport>
    <AesTransportSNMP community="public" portNumber="162"/>
  </transport>
</AesDestDefn>
        </destDefnList>
       <trigger>
<AesTriggerBatteryLife batteryStatus="2" param="00:00:00:00:00:00" triggerClass="2"/>
       </trigger>
</AesTrackDefn>
          </defnList>
        </AesTrackGroup>
</AddTrackGroup>
</SOAP-ENV:Body>
```

13.2.5 **Update Notification**

Whenever a location record is updated so long as the update is beyond a tolerance distance value since the last update.

Xml Request

```
<SOAP-ENV:Body>
<AddTrackGroup>
     <AesBusinessSession id="2397" mask="-1"/>
     <AesTrackGroup name="UpdateTest">
        <defnList>
           <AesTrackDefn name="updateTest">
     <destDefnList>
          <AesDestDefn destIPList="10.77.152.14,">
<transport>
    <AesTransportSNMP community="public" portNumber="162"/>
  </transport>
</AesDestDefn>
        </destDefnList>
       <trigger>
<AesTriggerUpdate param="00:00:00:00:00:ef" triggerClass="2"/>
       </trigger>
</AesTrackDefn>
          </defnList>
        </AesTrackGroup>
</AddTrackGroup>
</SOAP-ENV:Body>
```

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13.2.6 **Chokepoint Notification**

Each time a Tag encounters a ChokePoint.

Xml Request

```
<SOAP-ENV:Body>
 <AddTrackGroup>
   <AesBusinessSession id="2397" mask="-1"/>
     <AesTrackGroup name="ChokepointTest">
         <defnList>
             <AesTrackDefn name="chokepointTest">
      <destDefnList>
          <AesDestDefn destIPList="10.77.152.14,">
    <transport>
     <AesTransportSNMP community="public" portNumber="162"/>
    </transport>
                  </AesDestDefn>
       </destDefnList>
       <trigger>
<AesTriggerChokepoint chokepointMacList="00:0b:85:01:02:03,00:0b:85:01:02:04,"
operator="1" param="00"/>
   </trigger>
</AesTrackDefn>
           </defnList>
         </AesTrackGroup>
</AddTrackGroup>
</SOAP-ENV:Body>
```

13.2.7 **Emergency Notification**

Each time a tag notifies the lbs of an emergency

Xml Request

```
<SOAP-ENV:Body>
<AddTrackGroup>
     <AesBusinessSession id="2397" mask="-1"/>
     <AesTrackGroup name="EmergencyTest">
        <defnList>
            <AesTrackDefn name="emergencyTest">
      <destDefnList>
         <AesDestDefn destIPList="10.77.152.14,">
<transport>
    <AesTransportSNMP community="public" portNumber="162"/>
  </transport>
</AesDestDefn>
         </destDefnList>
        <trigger>
<AesTriggerEmergency emergencyMask="4" param="00:00:00:00:00:ef" triggerClass="2"/>
   </trigger>
</AesTrackDefn>
           </defnList>
         </AesTrackGroup>
</AddTrackGroup>
</SOAP-ENV:Body>
```

13.3 Java and c# Samples

13.3.1 WSDL to Java

WSDL can be converted to Java using WSDL2Java axis tool. Download the Axis2 at http://ws.apache.org/axis2/download.cgi

13.3.2 WSDL to java using Command Line

- Set Classpath to all the libraries of Axis2.

- Use the following command on the prompt.

```
java -classpath %AXIS2% org.apache.axis2.wsdl.WSDL2Java    -o c:\output -l java -d
xmlbeans -uri c:/wsdl/mse-location.wsdl
```

Note: xmlbeans option is must. Other databinding may fail.

Also Check the WSDL uri and xsd uri are in right path.

This will generate stub and skeleton code in addition to the normal methods in the WSDL. We can use this stub code to connect to the server and get the server response.

Note: *There will be two wsdl's mse-aaa.wsdl contains Login/Logout calls and mse-location.wsdl contains all location calls. So you need to convert both these wsdls to java class and then call the API. Please refer the sample java client for the usage*.

13.3.3 Axis2 Java Client

Steps for writing the client Program to test the web service.

1) Create an object for the Stub Class generated passing the URL of the service as argument.

2) We need to get the SSL certificate from the server and save it in local machine and then need to set this certificate in the properties while making web service call. This step is necessary. Use the InstalCert program, get the Certification, store it in local machine and give the path in the System.SetProperties statement in the sample after each stub call.

3) Use the method you want to operate on. The stub file generated contains all method names and parameters to pass in and the return element output.

4) Call the method using the object of the stub class.

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5) Stub file will in turn use the Apache Axis2 jars to connect to the server and gets the response.

6) Response contains full soap response so you can even get the individual values by parsing the xmlnodes.

InstallCert Program:

```
package com.cisco.mse;
import java.io.*;
import java.net.URL;
import java.security.*;
import java.security.cert.*;
import javax.net.ssl.*;
public class InstallCert {
    public static void main(String[] args) throws Exception {
        String host;
        int port;
        char[] passphrase;
        if ((args.length == 1) || (args.length == 2))
          {

            String[] c = args[0].split(":");
            host = c[0];
            port = (c.length == 1) ? 443 : Integer.parseInt(c[1]);
            String p = (args.length == 1) ? "changeit" : args[1];
            passphrase = p.toCharArray();
            } else
            {
            System.out.println("Usage: java InstallCert <host>[:port] [passphrase]");
            return;
            }

            File file = new File("jssecacerts");
            if (file.isFile() == false)
             {
            char SEP = File.separatorChar;
            File dir = new File(System.getProperty("java.home") + SEP + "lib" + SEP +
             "security");
            file = new File(dir, "jssecacerts");
            if (file.isFile() == false)
                {
                file = new File(dir, "cacerts");
                }
             }

            System.out.println("Loading KeyStore " + file + "...");
            InputStream in = new FileInputStream(file);
             KeyStore ks = KeyStore.getInstance(KeyStore.getDefaultType());
            ks.load(in, passphrase);
            in.close();
            SSLContext context = SSLContext.getInstance("TLS");
            TrustManagerFactory tmf =
             TrustManagerFactory.getInstance(TrustManagerFactory.getDefaultAlgorithm());
            tmf.init(ks);

        X509TrustManager defaultTrustManager = X509TrustManager)tmf.getTrustManagers()[0];
```

```
        SavingTrustManager tm = new SavingTrustManager(defaultTrustManager);
        context.init(null, new TrustManager[] {tm}, null);
        SSLSocketFactory factory = context.getSocketFactory();

        System.out.println("Opening connection to " + host + ":" + port + "...");
        SSLSocket socket = (SSLSocket)factory.createSocket(host, port);
        socket.setSoTimeout(10000);

        try {
            System.out.println("Starting SSL handshake...");
            socket.startHandshake();
            socket.close();
            System.out.println();
            System.out.println("No errors, certificate is already trusted");
        } catch (SSLException e) {
            System.out.println();
            e.printStackTrace(System.out);
        }

        X509Certificate[] chain = tm.chain;
        if (chain == null) {
            System.out.println("Could not obtain server certificate chain");
            return;
        }

        BufferedReader reader =

                new BufferedReader(new InputStreamReader(System.in));

        System.out.println();
        System.out.println("Server sent " + chain.length + " certificate(s):");
        System.out.println();
        MessageDigest sha1 = MessageDigest.getInstance("SHA1");
        MessageDigest md5 = MessageDigest.getInstance("MD5");
        for (int i = 0; i < chain.length; i++)
         {
            X509Certificate cert = chain[i];
            System.out.println (" " + (i + 1) + " Subject " + cert.getSubjectDN());
            System.out.println("   Issuer  " + cert.getIssuerDN());
            sha1.update(cert.getEncoded());
            System.out.println("   sha1    " + toHexString(sha1.digest()));
            md5.update(cert.getEncoded());
            System.out.println("   md5     " + toHexString(md5.digest()));
            System.out.println();
        }

     System.out.println("Enter certificate to add to trusted keystore or 'q' to quit:
[1]");

        String line = reader.readLine().trim();
        int k;
        try {
            k = (line.length() == 0) ? 0 : Integer.parseInt(line) - 1;
        } catch (NumberFormatException e) {
            System.out.println("KeyStore not changed");
```

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```java
            return;
        }

    X509Certificate cert = chain[k];
    String alias = host + "-" + (k + 1);
    ks.setCertificateEntry(alias, cert);

    OutputStream out = new FileOutputStream("jssecacerts");
    ks.store(out, passphrase);
    out.close();

    System.out.println();
    System.out.println(cert);
    System.out.println();
    System.out.println("Added certificate to keystore 'jssecacerts' using alias '"
            + alias + "'");
}

private static final char[] HEXDIGITS = "0123456789abcdef".toCharArray();

private static String toHexString(byte[] bytes)
{

    StringBuilder sb = new StringBuilder(bytes.length * 3);
    for (int b : bytes) {
        b &= 0xff;
        sb.append(HEXDIGITS[b >> 4]);
        sb.append(HEXDIGITS[b & 15]);
        sb.append(' ');
    }

    return sb.toString();

}



private static class SavingTrustManager implements X509TrustManager
{   private final X509TrustManager tm;
    private X509Certificate[] chain;
    SavingTrustManager(X509TrustManager tm) {
        this.tm = tm;
    }

    public X509Certificate[] getAcceptedIssuers() {
        throw new UnsupportedOperationException();
    }

    public void checkClientTrusted(X509Certificate[] chain, String authType)
    throws CertificateException {
        throw new UnsupportedOperationException();
    }

    public void checkServerTrusted(X509Certificate[] chain, String authType)
    throws CertificateException {
        this.chain = chain;
        tm.checkServerTrusted(chain, authType);
    }

}
```

```
}
```

Run:

Where MSEIP-IP Address of the MSE Engine. It will return all certificates in the server.

Enter 1 0r 2, index of the certificate to be used.

Jssecacerts file will be created in the current root folder were this program is exeuted.

Then use this file in the SetProperty of the sample program.

Sample client Program which uses the generated java files to connect to the server.

```java
package com.cisco.mse;

import java.rmi.RemoteException;

import com.cisco.mse.location.GetServerInfoDocument;

import com.cisco.mse.location.LocationServiceStub;

import com.cisco.mse.location.ResponseDocument;

import com.cisco.mse.types.AesBusinessSession;

import com.cisco.mse.types.AesLogin;

import com.cisco.mse.types.AesLogout;

import com.cisco.mse.types.LoginDocument;

import com.cisco.mse.types.LoginMethodArgs;

import com.cisco.mse.types.LogoutDocument;

import com.cisco.mse.types.LogoutMethodArgs;

import com.cisco.mse.types.SessionDocument;


public class TestSample {

        public static void properties() {

                System.setProperty("javax.net.ssl.trustStore",

                                "D:\\namespace\\src\\jssecacerts");
```

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```java
            System.setProperty("java.protocol.handler.pkgs",

                        "com.sun.net.ssl.internal.www.protocol");

    }



    public static void main(String[] args) throws RemoteException {



            AaaServiceStub stub = new AaaServiceStub("https://1.2.3.105/aaa/");

            properties();

            LoginDocument param4 = LoginDocument.Factory.newInstance();

            LoginMethodArgs login = LoginMethodArgs.Factory.newInstance();

            AesLogin aesLogin = AesLogin.Factory.newInstance();

            aesLogin.setUserName("admin");

            aesLogin.setPassword("admin");

            login.setAesLogin(aesLogin);

            param4.setLogin(login);

            SessionDocument response = stub.Login(param4);

            System.out.println("Login Response\n"+response);

            LocationServiceStub lstub = new LocationServiceStub(

                        "https://1.2.3.105/location/");

            properties();

            GetServerInfoDocument infoDoc = GetServerInfoDocument.Factory

                        .newInstance();

            infoDoc.addNewGetServerInfo().addNewAesBusinessSession().setId(

                        response.getSession().getAesBusinessSession().getId());

            ResponseDocument resp = lstub.GetServerInfo(infoDoc);

            System.out.println("GetServerInfo Response\n"+resp);



            LogoutDocument param5 = LogoutDocument.Factory.newInstance();

            LogoutMethodArgs logout = LogoutMethodArgs.Factory.newInstance();

            AesLogout aesLogout = AesLogout.Factory.newInstance();

            AesBusinessSession AB = response.getSession().getAesBusinessSession();
```

```
            logout.setAesBusinessSession(AB);

            logout.setAesLogout(aesLogout);

            param5.setLogout(logout);

            com.cisco.mse.types.ResponseDocument logoutresponse = stub

                        .Logout(param5);

            System.out.println("Logout Response\n"+logoutresponse);



        }

}
```

Compile:

```
Javac –classpath %AXIS2% TestSample.java
```

Run:

```
Java –classpath %AXIS2% TestSample
```

Note: *All Axis2 jars should be in the classpath. Axis2 jars will be on the /lib directory of AXIS. If you extracted your Axis2 distribution to C:\ then set the following in the environment variable under AXIS2.*

```
      C:\axis2-1.1\lib\activation-1.1.jar;C:\axis2-1.1\lib\annogen-
0.1.0.jar;C:\axis2-1.1\lib\axiom-api-1.2.jar;C:\axis2-1.1\lib\axiom-dom-
1.2.jar;C:\axis2-1.1\lib\axiom-impl-1.2.jar;C:\axis2-1.1\lib\axis2-1.1.jar;C:\axis2-
1.1\lib\axis2-adb-1.1.jar;C:\axis2-1.1\lib\axis2-adb-codegen-1.1.jar;C:\axis2-
1.1\lib\axis2-codegen-1.1.jar;C:\axis2-1.1\lib\axis2-java2wsdl-1.1.jar;C:\axis2-
1.1\lib\axis2-jibx-1.1.jar;C:\axis2-1.1\lib\axis2-kernel-1.1.jar;C:\axis2-
1.1\lib\axis2-saaj-1.1.jar;C:\axis2-1.1\lib\axis2-soapmonitor-1.1.jar;C:\axis2-
1.1\lib\axis2-spring-1.1.jar;C:\axis2-1.1\lib\axis2-tools-1.1.jar;C:\axis2-
1.1\lib\axis2-xmlbeans-1.1.jar;C:\axis2-1.1\lib\backport-util-concurrent-
2.2.jar;C:\axis2-1.1\lib\commons-codec-1.3.jar;C:\axis2-1.1\lib\commons-fileupload-
1.1.1.jar;C:\axis2-1.1\lib\commons-httpclient-3.0.1.jar;C:\axis2-1.1\lib\commons-io-
1.2.jar;C:\axis2-1.1\lib\commons-logging-1.1.jar;C:\axis2-1.1\lib\geronimo-spec-jms-
1.1-rc4.jar;
```

```
      C:\axis2-1.1\lib\jaxen-1.1-beta-10.jar;C:\axis2-1.1\lib\jibx-bind-
   1.1.2.jar;C:\axis2-1.1\lib\jibx-run-1.1.2.jar;C:\axis2-1.1\lib\mail-1.4.jar;C:\axis2-
   1.1\lib\neethi-2.0.jar;C:\axis2-1.1\lib\servletapi-2.3.jar;C:\axis2-1.1\lib\stax-api-
   1.0.1.jar;C:\axis2-1.1\lib\woden-1.0.0M6.jar;C:\axis2-1.1\lib\wsdl4j-
   1.6.1.jar;C:\axis2-1.1\lib\wstx-asl-3.0.1.jar;C:\axis2-1.1\lib\xalan-
   2.7.0.jar;C:\axis2-1.1\lib\xbean-2.2.0.jar;C:\axis2-1.1\lib\xercesImpl-
   2.8.1.jar;C:\axis2-1.1\lib\xml-apis-1.3.03.jar;C:\axis2-1.1\lib\XmlSchema-1.2.jar;
```

NOTE: *The above program is tested using JDK1.5.09, Eclipse and Apache Axis2.*

13.4 Output of Java Client

Login Response

```
<Session xmlns="http://cisco.com/mse/types"
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">

  <AesBusinessSession changedOn="0" id="21028" mask="-1" objectId="0" options="0"
parentId="0"/>

</Session>

GetServerInfo Response

<Response xmlns="http://cisco.com/mse/location" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">

  <AesServerInfo activeElementsLimit="2500" allocatedMemory="130154496"
currActiveSessions="1" currentTime="1211177112376" daysToKeepEvents="2"
dbDiskMemory="40992768" dbFreeSize="11840" dbVirtualMemoryLimit="256000000"
keepAbsentDataInMins="1440" logLevel="INFO" logModules="262143" maxMemory="518979584"
portNumber="8001" productName="Cisco Mobility Service Engine" restarts="4"
sessionTimeoutInMins="30" startTime="1211175437462" timeOffset="-28800000"
timeZone="America/Los_Angeles" useHTTP="false" usedMemory="32264608" version="5.2.29.0">

    <activeSessions>

      <AesBusinessSession clientIPAddress="1.2.3.105" groupId="1" id="21028"
lastAccessTime="1211177112375" mask="-1" startTime="1211176954405" userId="1"/>

    </activeSessions>

    <hwInfo>

      <AesHwServerInfo serverType="-1"/>

    </hwInfo>

    <mseServiceInfoList>

      <MseServiceInfo adminStatus="0" operationStatus="0" serviceName="WIPS Service"
serviceType="0" serviceVersion="1.0.272.0"/>

      <MseServiceInfo adminStatus="0" operationStatus="0" serviceName="SMC Service"
serviceType="0" serviceVersion="5.2.16.0"/>

    </mseServiceInfoList>

  </AesServerInfo>
```

```
</Response>
```

Logout Response

```
<Response xmlns="http://cisco.com/mse/types"
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">

  <AesResult result="true"/>

</Response>
```

13.4.1 **Java Samples**

Please Find attached the location-client-4.x.jar in the samples which contains the generated java sources from wsdl, their class files and the xsb files generated which is needed for runtime classpath. You can write a sample program as above and add this location-client-4.x.jar to the classpath.

13.5 WSDL to C#

WSDL can be converted to C# using .NET framework and SDK. Download the .NET framework and SDK from

Framework: http://www.microsoft.com/downloads/details.aspx?familyid=0856EACB-4362-4B0D-8EDD-AAB15C5E04F5&displaylang=en

SDK : http://www.microsoft.com/downloads/details.aspx?familyid=fe6f2099-b7b4-4f47-a244-c96d69c35dec&displaylang=en

After installing, Click Start->Programs-> Microsoft .NET Framework SDK v2.0-> SDK Command Prompt.

In the Command prompt,

If using Microsoft Visual Studio 2005 then type

wsdl /edb /out:c:\csharp /protocol:SOAP c:/location/wsdl/mse-location.wsdl c:/location/wsdl/mse-location.xsd

where

/edb – Enable data binding

/out - Output location. Csharp file will be generated in this location

/protocol: Protocol to be used SOAP/ SOAP12/HttpGet/HttpPost.

If using Microsoft Visual Studio 2003 then type

**wsdl /out:c:\csharp /protocol:SOAP c:/location/wsdl/mse-location.wsdl
c:/location/wsdl/mse-location.xsd**

Modification in the generated file:

Please add the namespace to the generated cs file from wsdl.

For example: aaaService.cs will be generated from mse-aaa.wsdl and add the namespace
declaration as

```
namespace aaa{
/// <remarks/>
[System.CodeDom.Compiler.GeneratedCodeAttribute("wsdl", "2.0.50727.42")]
[System.Diagnostics.DebuggerStepThroughAttribute()]
[System.ComponentModel.DesignerCategoryAttribute("code")]
[System.Web.Services.WebServiceBindingAttribute(Name="AaaBinding",
Namespace="http://cisco.com/mse")]
[System.Xml.Serialization.XmlIncludeAttribute(typeof(AesObject))]
public partial class aaaService : System.Web.Services.Protocols.SoapHttpClientProtocol
{….
}
```

Similarly LocationService.cs will be generated from mse-location.wsdl and add the namespace
declaration as

```
namespace location
{
/// <remarks/>
[System.CodeDom.Compiler.GeneratedCodeAttribute("wsdl", "2.0.50727.42")]
…. [System.Xml.Serialization.XmlIncludeAttribute(typeof(AesTrackDefn[]))]
public partial class LocationService :
System.Web.Services.Protocols.SoapHttpClientProtocol {
….}
```

13.5.1 **For Https Support**

For suppressing the ssl certificate please do the following;

- Add the following in the generated csharp file, for Eg in LocationService.cs file

```
 using System.Net;
 protected override WebRequest GetWebRequest(Uri uri)
```

```
  {

    HttpWebRequest webRequest = (HttpWebRequest)base.GetWebRequest(uri);

    webRequest.KeepAlive = false;

    webRequest.ProtocolVersion = HttpVersion.Version10; //

    ServicePointManager.ServerCertificateValidationCallback += new

    System.Net.Security.RemoteCertificateValidationCallback(ValidateServerCertificate);

    return webRequest;

  }

 public static bool ValidateServerCertificate(object sender,
System.Security.Cryptography.X509Certificates.X509Certificate certificate,
System.Security.Cryptography.X509Certificates.X509Chain chain,
System.Net.Security.SslPolicyErrors sslPolicyErrors)

   {

     return true;

   }
```

13.5.2 **C# Sample**

```
using System;

using System.Data;

using System.Web;

using System.Collections;

using System.Web.Services;

using System.Web.Services.Protocols;

using System.ComponentModel;

using aaa;

using location;

namespace WebService

{

    public class TestGetServerInfo

    {

        [STAThread]
```

```csharp
 static void Main(string[] args)

{

   aaaService LS = new aaaService();

   LocationService LS1 = new LocationService();

   //Login

   LoginMethodArgs LM = new LoginMethodArgs();

   AesLogin AL = new AesLogin();

   AL.userName = "admin" ;

   AL.password = "admin" ;

   LM.AesLogin  = AL ;


   Session s = LS.Login(LM);

   if(s!=null)

   {

     aaa.AesBusinessSession AB =(aaa.AesBusinessSession)  s.AesBusinessSession;

      Console.WriteLine("<---------LOGIN-------------------->");

      Console.WriteLine("Id =" +AB.id);

      Console.WriteLine("<---------------------------------->");

       //GetServerInfo

     location.GetTypeArgs GT = new location.GetTypeArgs();

     location.AesBusinessSession bSession = new location.AesBusinessSession();

    bSession.id= AB.id;

    GT.AesBusinessSession = bSession;

    location.Response r1= LS1.GetServerInfo(GT);

    if(r1!=null)

    {

      AesServerInfo AS =(AesServerInfo) r1.Items.GetValue(0);

      Console.WriteLine("<---------SERVERINFO-------------------->");

      Console.WriteLine("ProdName="+ AS.productName);

      Console.WriteLine("Version=" +AS.version);

      Console.WriteLine("ElemList=" + AS.activeElementsLimit);
```

```csharp
        Console.WriteLine("activeElementsLimit="+ AS.activeElementsLimit);

        Console.WriteLine("currActiveElements="+ AS.currActiveElements);

        Console.WriteLine("allocatedMemory="+ AS.allocatedMemory);

        Console.WriteLine("currActiveSessions="+ AS.currActiveSessions);

        Console.WriteLine("dbBackupInDays="+ AS.dbBackupInDays);

        Console.WriteLine("currentTime="+ AS.currentTime);

        Console.WriteLine("dbDiskMemory="+ AS.dbDiskMemory);

        Console.WriteLine("<-------------------------------->");

         //Logout

        LogoutMethodArgs LMA = new LogoutMethodArgs();

        LMA.AesBusinessSession = AB;

        LMA.AesLogout = new AesLogout();

        aaa.Response r2 = LS.Logout(LMA);

        if(r2==null)

        {

                Console.WriteLine("Logout Failed");

        }

        Console.WriteLine("<---------LOGOUT-------------------->");

        aaa.AesResult ARS =(aaa.AesResult) r2.Item;

        Console.WriteLine("Result="+ ARS.result);

        Console.WriteLine("<-------------------------------->");

        }

     else{

        Console.WriteLine("GetNetworkDesignList Failed");

      }

  }

 else{  Console.WriteLine("Login Failed");

 }
```

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```
            }
        }
    }

}
```

13.5.3 **To Compile & Run**

Change the prompt to csharp and type

csc aaaServics.cs LocationService.cs TestGetServerInfo.cs

Where aaaService.cs, LocationService.cs are the Generated files from WSDL to run TestGetServerInfo.

13.5.4 **Image Retreival for GetNetworkDesign & GetNetworkDesignList Calls**

Dot Net Framework does not support SwA (SOAP with Attachment). One has to modify the generated LocationService.cs file from WSDL for image retrieval.

Cisco has done a workaround for that. Please find the following files added under the design folder in the csharp samples.

aaaService.cs, LocationService.cs, ImageParser.cs, XMLNoNamespaceWriter.cs

To Compile - csc *.cs

To Execute - TestGetNetworkDesign

AesViewImage.sourceFile contains the Image Location.

Depends on your requirement you can implement similar thing in your application.