MobileIron Event Notification Service and Common Platform Services API Guide
for MobileIron Cloud 75 and MobileIron Core 11.0.0.0

January 22, 2021

For complete product documentation, see:
Common Platform Services Product Documentation.
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**App Catalog APIs**

**Get application inventory**

- HTTP Method
- Request URI
- Request parameters
- Response fields
- Example request
- Example responses
  - In-house app response

**Metadata APIs**

**Get current minor version of the API**

- HTTP Method
- Request URI
- Response fields
- Example response

**Get device registration URI**

- HTTP Method
- Request URI
- Example responses
  - MobileIron Cloud
  - MobileIron Core

**Get device app metadata**

- HTTP method
- Request URI
- Example response

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Introduction

The MobileIron Event Notification Service and Common Platform Services (CPS) API provide automated clients with a messaging push and an RPC pull interface for integration with third-party solutions, namely:

- CPS API: an RPC (HTTP/JSON) API to retrieve detailed information of interest to integrators. The API is an RPC API using JSON over HTTP. See the API-related chapters, starting with API characteristics.

The MobileIron Event Notification Service and CPS API comprise an integration platform between MobileIron's integration partners and the MobileIron customer base. Before this integration platform, integration partners had to write and maintain two separate integrations between MobileIron Core and MobileIron Cloud, and constantly poll the API for device state changes, increasing processing complexity and computational load.

The MobileIron Event Notification Service notifies integration partners of events within a few seconds of event occurrence, and the CPS API provides standard responses across MobileIron Core and Cloud, serving as the ideal integration platform between integration partners and the MobileIron Core and MobileIron Cloud customer base.
## What's new

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
</table>
| **January 22, 2021** | Added the following iOS fields to the application object model:  
  - adHocCodeSigned  
  - appStoreVendable  
  - betaApp  
  - deviceBasedVPP  
  - externalVersionIdentifier  
  - updateAvailable  
  - installing  
  - validated  
  - shortVersion  
  - bundleVersion  
  See Get application inventory for an example response with these new fields. |
| **October 28, 2020** | Added the managed field to the return of Get application inventory.                                                                          |
| **August 31, 2020**  | The following calls are now supported in MobileIron Core 10.8.0.0, and were already supported in MobileIron Cloud:  
  - Get device groups associated with device list  
  - Search users by GUID |
| **August 3, 2020**    | Clarified that the direction is inbound for the port (8883) on which the messaging service listens.                                           |
| **July 21, 2020**     | Added the call, Get device groups associated with device list.                                                                              |
| **June 11, 2020**     | - Add documentation for the call, Search users by GUID.  
  - Updated documentation for the call Get devices by UEM or deviceGuid identifiers to describe that the call can also take the deviceGUID as a search identifier. |
| **April 2, 2020**     | - Updated Device object model to include deviceGuid.  
  - Updated Example Device Event messages to include deviceGuid.                                                                         |
| **July 31, 2019**     | - Clarified MQTT and API endpoints.  
  - Updated Authentication methods supported for Core and Cloud to |
Resolved issues

For resolved issues identified in previous releases, see the MobileIron Event Notification Service and Common Platform Services API Guide for the desired releases in MobileIron Common Platform Services Product Documentation.

This release includes the following resolved issues:

- **AW-32833**: Previously, the GET /msa/v1/cps/appcatalog/apps API returned multiple versions of the same app, whereas the App Catalog user interface showed only the latest of the two uploaded versions in the app catalog listing. This issue has been fixed.
• **AW-32746**: The WINDOWS parameter of the GET /msa/v1/cps/appcatalog/apps API now returns expected results.

## Known issues

For known issues identified in previous releases, see the *MobileIron Event Notification Service and Common Platform Services API Guide* for the desired releases in *MobileIron Common Platform Services Product Documentation*.

This release does not include new known issues.

## Limitations

For third-party limitations identified in previous releases, see the *MobileIron Event Notification Service and Common Platform Services API Guide* for the desired releases in *MobileIron Common Platform Services Product Documentation*.

This release includes the following limitation:

• **AW-23186**: The GET /msa/v1/cps/user API call yields differing result formats on Cloud and Core for the following items:

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<th>Cloud</th>
<th>Core</th>
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<tbody>
<tr>
<td>LDA-P custom attribute keys</td>
<td>Lower case</td>
<td>Camel Case</td>
</tr>
<tr>
<td></td>
<td>objectguid userprincipalname</td>
<td>objectGUID userPrincipalName</td>
</tr>
<tr>
<td></td>
<td>See the highlighted example in Cloud response below.</td>
<td>See the highlighted example in Core response below.</td>
</tr>
<tr>
<td>objectguid field</td>
<td>Hexadecimal:</td>
<td>Unencoded string:</td>
</tr>
<tr>
<td></td>
<td>\3f\21\d9\5b\1c\ab\cf\49\81\11\7a\fa\b7\d2\ab\6a</td>
<td>9a34fe08e8041c47991c5a387efff6bb</td>
</tr>
<tr>
<td></td>
<td>See the highlighted example in Cloud response below.</td>
<td>See the highlighted example in Core response below.</td>
</tr>
</tbody>
</table>
Cloud response

```json
{
    "searchResults": [
        {
            "enabled": true,
            "createdAt": 1520419288985,
            "accountSource": "LDAP",
            "displayName": "cloud user",
            "emailAddress": "cloud.user@exchce.com",
            "firstName": "cloud",
            "lastName": "user",
            "userId": "cloud.user12@exchce.com",
            "userUUid": "a27c1b0e-96f6-4acc-af79-b3af881db1cd",
            "ldapCustomAttributes": {
                "objectguid": "\3f\21\d9\5b\1c\ab\cf\49\81\11\7a\fa\b7\d2\ab\6a",
                "userprincipalname": "cloud.user12@exchce.com"
            }
        }
    ],
    "results": 1,
    "offset": 0,
    "limit": 50
}
```

Core response

```json
{
    "searchResults": [
        {
            "enabled": true,
            "createdAt": 1520553600000,
            "accountSource": "LDAP",
            "displayName": "testuser6771",
            "emailAddress": "testuser6771@auto8.mobileiron.com",
            "firstName": "testuser6771",
            "lastName": "user",
            "userId": "testuser6771",
            "userUUid": "bff6bf12-72ff-4524-97a0-064cc137f955",
            "ldapCustomAttributes": {
                "objectGUID": "9a34fe08e8041c47991c5a387efff6bb",
                "userPrincipalName": "testuser6771@auto8.mobileiron.com"
            }
        }
    ],
    "results": 1,
    "offset": 0,
    "limit": 50
}
```
Getting Started

Prerequisites

These sections describe the prerequisites for using the MobileIron Event Notification Service and Common Platform Services API.

Common prerequisites

You need to have a working MobileIron Core or MobileIron Cloud environment with registered devices. See the MobileIron Cloud Administrator Guide and the MobileIron Core documentation set for information about configuring your environment to work with this integration platform.

Event Notification Service prerequisites

- Event notification requires Certificate based Authentication for each connection using client (identity) certificates issued by DigiCert, Inc. See Authentication, Certificate-based authentication workflows, and Example MobileIron Cloud certificate-based authentication cURL command.
- Integrators can only subscribe to events if admin user associated with the certificate has been granted the CPS role. See Assigning the CPS role to a user on page 10.

CPS API prerequisites

Authentication

MobileIron supports the following authentication methods for CPS on Core and Cloud over an encrypted link between client and server using Transport Layer Security (TLS) v1.2:

- Basic authentication
- Certificate-based authentication

Basic authentication

The credentials you use for basic authentication must correspond to a user with the required CPS role. See Assigning the CPS role to a user for how to assign the CPS role to users.
Certificate-based authentication

The MobileIron Common Platform Services API requires authentication for each API call, and supports certificate-based authentication using client (identity) certificates issued by DigiCert, Inc. When using certificate-based authentication, you must include the identity certificate in every API call and when establishing a connection to MQTT. See Example MobileIron Cloud certificate-based authentication cURL command for how to include the certificate. MobileIron Cloud or Core compares the username and email address (RFC 822) in the certificate SAN field against the registered username and email address. If these do not match, the system refuses the MQTT connection and API calls. See Certificate-based authentication workflows for how to set up certificate-based authentication, and Certificate-based authentication security for a discussion of how MobileIron enforces certificate security.

NOTE: The system does not renew certificates. Please keep track of your certificate expiration date and renew the certificate before expiration.

See Certificate-based authentication workflows and Example MobileIron Cloud certificate-based authentication cURL command for more details.

Certificate-based authentication workflows

Thus section describes the following workflows:

- Obtaining a certificate
- Using certificates in messaging
- Using certificate for API calls

Workflow: Obtaining a certificate

Follow this workflow to set up certificate-based authentication:

1. Request Certificate
- User or partner requests a premium certificate from the DigiCert CA, https://www.digicert.com/secure/order.
- The certificate issuer should be "DigiCert SHA2 Assured ID CA"
- Signature Hash must be SHA2.
- Common Name must be the MobileIron Cloud or Core email of a user with the CPS role. See Assigning the CPS role to a user on page 10 for how to assign the CPS role to users.
- Recipient Email must be a working email address of a username that is also registered with same email id in MobileIron Cloud or Core.

2. Send Mail
   - DigiCert sends an email to the Recipient Email containing an URL at which to generate the certificate for the Common Name, in this case, the MobileIron Cloud or Core email id associated with the CPS role.

3. Get Certificate
   - DigiCert sends a certificate in P12 format.
   - Ensure that certificate is created with the "RFC 822 Name" header.
   - The "RFC 822 Name" should be the email id of the user who will have the required CPS role. See Assigning the CPS role to a user on page 10 for how to assign the CPS role to users.

4. Acknowledge
   - User clicks the URL to generate the certificate.

5. Request a new user
   - User or partner requests the MobileIron admin to create a user.

6. Create user
   - The MobileIron admin creates a single user for the given email id. The email id must be the same as to which the certificate refers. See "Adding a User" in the MobileIron Cloud Administrator Guide and "Managing Users" in the Getting Started with MobileIron Core guide for information about creating users.

7. Enable CPS role
   - The MobileIron admin enables the CPS role for the email id. See Assigning the CPS role to a user on page 10 for how to assign the CPS role to users.

Workflow: Using certificates in messaging

Follow this workflow to use certificates in messaging:

![Diagram of certificate workflow](image-url)
Workflow: Using certificates for API calls

Follow this workflow to use certificates for API calls:

Certificate-based authentication security

CPS supports Certificate-based Mutual Authentication. Mutual Authentication requires that both the server and client present a certificate to prove their identity. This allows CPS to prevent unauthorized clients without valid certificates from connecting to CPS APIs and event notification service.

Certificate Validation

To be considered a valid certificate, a certificate must:

1. Chain to a Certificate Authority (CA) trusted by MobileIron Cloud and MobileIron Core. Currently, this is DigiCert only.
2. Be otherwise valid, for example, marked as usable for client authentication, and not expired.
3. After validating a certificate as valid, MobileIron extracts the email identity of a certificate using the SubjectAltName RFC822Name value. MobileIron enforces that only one RFC822Name value may exist in a given certificate, and rejects a certificate if there are multiple values.

X509v3 Subject Alternative Name format: email: <name>@<domain>.com

4. After extracting the email identity from the certificate, MobileIron performs a lookup for the user and ensures user has the CPS role for the MobileIron Cloud or MobileIron Core tenant.
Security of Certificate Procurement Process

The security of this system depends upon preventing unauthorized users from obtaining certificates that are valid for authorized users. To that end, DigiCert has the following processes and protections in place:

1. When a certificate for an email address is requested, an email is sent to that email address requesting confirmation of the certificate request. Note: it is not required that the requester has access to the email address. This allows admins to request (and pay for) certificates on behalf of users.
2. The certificate is only generated when the email recipient clicks the confirmation link. Prior to this, the certificate requester is prevented from seeing the certificate.
3. The certificate and private key are sent to the email address to which the certificate belongs. If the certificate is requested by person A who does not have access to mailbox B, then A will not be able to obtain the private key.
4. The certificate (public) is visible to the certificate requester on DigiCert’s website, but the private key is not. Certificate-based Mutual Authentication works by proving that each side has possession of their respective private key. Thus, by providing the private key only to the intended recipient and not the requester, the system prevents attackers from gaining unauthorized access to the APIs.

Assigning the CPS role to a user

The process differs between MobileIron Cloud and MobileIron Core.

Assigning the CPS role to a MobileIron Cloud user

To assign the CPS role to a user:

1. Log in to MobileIron Cloud and then click Users.
2. Select Users.
3. Select a user.
4. Select Append Roles.
5. Select the **Common Platform Services (CPS)** role.
6. Click **Next**.
7. Click **Done**.

### Assigning the CPS role to a MobileIron Core user

To assign the CPS role to a user:

1. Log in to MobileIron Core and then click **Admin**.
2. Select a user.
3. Select Edit Roles.
4. Assign the admin user to the global space.

NOTE: The user will be unable to access Common Platform Services functionality if assigned to a device space other than global.
5. Select the Common Platform Services (CPS) role.
6. Click Save.
Enabling messaging

The process for enabling messaging differs between MobileIron Cloud and MobileIron Core. See the following sections for details.

Enabling messaging on MobileIron Cloud

You can enable messaging using the MobileIron Cloud admin portal.

To enable messaging:

1. Login to MobileIron Cloud, and then select Admin.

2. Select Common Platform Services Notifications.
3. Toggle the CPS notifications switch to enable or disable the service.

Enabling messaging on MobileIron Core

You run the MobileIron Core CLI program to enable messaging. This procedure invokes a message broker, enables the Event Notification Service event notification feature, restarts the MobileIron server, and restarts Apache Tomcat (on MobileIron Core) to reload configurations.

Considerations:
- The Messaging server listens to subscribing client requests over port 8883, and this port must be open inbound for the service to function.
- If MobileIron Core is running in a High Availability configuration, please enable messaging on both primary and secondary nodes.

To enable or disable messaging, run the MobileIron Core CLI program as shown below:
Welcome miadmin it is Thu May 4 13:49:39 UTC 2017
CORE(9.4.0.0-2388)@hostname> enable
Password:
CORE(9.4.0.0-2388)@hostname#configure terminal
Enter configuration commands, one per line.
CORE(9.4.0.0-2388)@hostname/config#activemq
Warning: Maintenance mode command.
Portal service will be stopped during this operation. Proceed? (y/n)y
Updating chkconfig...
Updating portal...
Starting ActiveMQ...
INFO: Loading '/mobileiron.com/programs/org.apache.activemq/bin/env'
INFO: Using java '/mobileiron.com/programs/com.mobileiron.platform.jre8/bin/java'
INFO: Starting - inspect logfiles specified in logging.properties and log4j.properties to get details
INFO: pidfile created: '/mobileiron.com/programs/org.apache.activemq/data/activemq.pid' (pid '22954')
Capturing tomcat metrics: [ OK ]
Stopping tomcat: [ OK ]
Starting tomcat: Using TOMCAT_ALLOCATION_MB=2048


Enabling messaging
Validating Event Notification Service and CPS API functionality

To validate Event Notification Service functionality, see the section, Sample client snippet for message subscriber on page 20 for how to write a script that verifies that you can subscribe to events.

To validate that you can use the CPS API, run the call described in the section, Getting event subscription metadata on page 17.

Validating Event Notification Service and CPS API functionality
Using the Event Notification Service

Overview

The Event Notification Service provides automated clients with an MQTT endpoint for notifications of activities within MobileIron Cloud and MobileIron Core.

Messages indicate:

- Device activity, such as registration, check-in, and retirement
- Device state activity, for example, transitions between compliant and non-compliant, and back
- Administrative changes

A variety of out-of-the-box MQTT implementations are available and this manual provides sample client code in the section, Sample client snippet for message subscriber on page 20. Messages are JSON objects, and any of the widely-available JSON implementations can de-serialize them. For more information about MQTT, visit http://mqtt.org/documentation.

TLS (Transport Layer Security) is the standard security technology for establishing an encrypted link between a server and a client. This link ensures that all data passed between the web server and browsers remain private and integral. Partner connection and communication with a message broker as a subscriber is TLS secured and encrypted.

Notes:

- MQTT protocol enabled by Core for CPS events only supports TLS 1.2.
- MobileIron recommends a maximum of fifteen connections per tenant. The best practice is to use a single connection to connect and subscribe to all the required topics from a tenant or Core.
- Every connection should have a unique MQTT client ID.
- Subscribers (MQTT/TLS clients) need to connect to broker over TLS encrypted port 8883. See Endpoint information for the broker URL to use for your environment.
- For MobileIron Core, during backup and restore on a secondary node, any cipher suite and protocol configuration changes for incoming TLS connections from MobileIron System Manager (MICS) has to be manually replicated on the secondary node because MICS configurations are not synced.
- All MQTT clients maintaining an active subscription when MQTT sends the message receive the message. The system purges the message after delivery, even if the message is consumed by only one active client that acknowledges receipt with a PUBACK command. MQTT delivers messages with QoS level 1, which means the sender can deliver the message more than once until the sender receives a PUBACK command from a receiving client.
- If no active consumers are available at the instant message is published to the messaging server, the message would be retained in the system for a maximum duration of 3 hours before it either gets consumed by a re-connecting durable subscriber or gets evacuated out of the system.
Suggested messaging integration workflow

1. Obtain endpoint URLs and a login email address to make a connection. These are provided separately by your MobileIron account representative. You also need a client (identity) certificate. See Authentication and Certificate-based authentication workflows.
2. Use the Getting event subscription metadata call to get list of available events and topics to which to subscribe.
3. Edit your login information into the sample client snippet for message subscriber, then execute one of the sample clients. This connects to the messaging system, registers for events, and begins printing message activity to the standard output. See Sample client snippet for message subscriber on page 20.
4. Register a device to generate events that will enable you to test your integration.
5. Verify that device registration and check-in actions are showing up on your console from your client.

Endpoint information

The endpoints differ between MobileIron Cloud and MobileIron Core.

The following table summarizes the endpoints:

<table>
<thead>
<tr>
<th>MobileIron Cloud</th>
<th>MobileIron Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>For example, given the cluster NA1, then the endpoint address would be: ssl://queue-na1.mobileiron.com:8883</td>
<td>For example, given the fully qualified hostname, acme.mobileiron.com, then the endpoint address would be: ssl://acme.mobileiron.com:8883</td>
</tr>
</tbody>
</table>

Getting event subscription metadata

This call returns available event types to which you can subscribe and the retention time for Event Notification Service events.

HTTP Method

GET
Request URI

/msa/v1/cps/event/$metadata

Example response

MobileIron Cloud

{
   "topics": {
      "device_profile_inventory_update": "18ccc64c-66e4-4e27-8bd6-9ac-c9c8d0224/device/profile_inventory",
      "device_cert_inventory_update": "18ccc64c-66e4-4e27-8bd6-9acc9c8d0224/device/cert_inventory",
      "device_compliant": "18ccc64c-66e4-4e27-8bd6-9acc9c8d0224/device/compliant",
      "device_check_in": "18ccc64c-66e4-4e27-8bd6-9acc9c8d0224/device/check_in",
      "device_app_inventory_update": "18ccc64c-66e4-4e27-8bd6-9acc9c8d0224/device/app_inventory",
      "device_wiped": "18ccc64c-66e4-4e27-8bd6-9acc9c8d0224/device/wiped",
      "device_not_compliant": "18ccc64c-66e4-4e27-8bd6-9acc9c8d0224/device/not_compliant",
      "device_enrolled": "18ccc64c-66e4-4e27-8bd6-9acc9c8d0224/device/enrolled",
      "device_retired": "18ccc64c-66e4-4e27-8bd6-9acc9c8d0224/device/retired"
   },
   "retentionPeriodMinutes": 180
}

MobileIron Core

{
   "topics": {
      "device_not_compliant": "device/not_compliant",
      "device_compliant": "device/compliant",
      "device_retired": "device/retired",
      "device_enrolled": "device/enrolled",
      "device_app_inventory_update": "device/app_inventory",
      "device_profile_inventory_update": "device/profile_inventory",
      "device_cert_inventory_update": "device/cert_inventory",
      "device_wiped": "device/wiped",
      "device_check_in": "device/check_in"
   },
   "retentionPeriodMinutes": 180
}

The key in the "topics" JSON defines the event types available and the corresponding values indicate the destination topic to which the partner should subscribe to get respective event notifications. The system retains messages for three hours and then purges them if they are not consumed and acknowledged with a PUBACK command.
Messages

There is currently one message format defined. See Device on page 29, and see the example messages below.

Example Device Event messages

App install

```json
{
    "timestamp": 1582796173229,
    "eventType": "device.app_inventory",
    "devices": [
        {
            "compliant": true,
            "quarantined": false,
            "blocked": false,
            "compromised": false,
            "status": "ACTIVE",
            "lastCheckInTime": 1582796171062,
            "registrationTime": 1582608427870,
            "identifier": "f2e01873c6d96d87f1a34ff72e0e4143e42ee089",
            "macAddress": "74:81:14:d6:f5:b7",
            "manufacturer": "Apple Inc.",
            "model": "iPad5,3",
            "os": "IOS",
            "osVersion": "12.2",
            "serialNumber": "DMPPK6YVG5VT",
            "userId": "rc@mi.com",
            "userUuid": "5159964d-95a7-466f-9677-1b90877f045f",
            "iosUdid": "f2e01873c6d96d87f1a34ff72e0e4143e42ee089",
            "deviceGuid": "1d71e131-0487-4d1d-9a0d-89f2bd1a888d"
        }
    ]
}
```

Device retire

```json
{
    "timestamp": 1582796293479,
    "eventType": "device.retired",
    "devices": [
        {
            "compliant": true,
            "quarantined": false,
            "compromised": false,
            "status": "RETIRED",
            "lastCheckInTime": 1582796291883,
            "registrationTime": 1582608427870,
            "identifier": "f2e01873c6d96d87f1a34ff72e0e4143e42ee089",
            "macAddress": "74:81:14:d6:f5:b7",
        }
    ]
}
```
Sample client snippet for message subscriber

This example code snippet is for the Paho client. For more information, see https://eclipse.org/paho/clients/java/.

```java
import java.io.BufferedInputStream;
import java.io.FileInputStream;
import java.security.KeyStore;
import java.security.Security;
import java.security.cert.CertificateFactory;
import java.security.cert.X509Certificate;
import javax.net.ssl.KeyManagerFactory;
import javax.net.ssl.SSLContext;
import javax.net.ssl.TrustManagerFactory;
import org.bouncycastle.jce.provider.BouncyCastleProvider;
import org.eclipse.paho.client.mqttv3.IMqttDeliveryToken;
import org.eclipse.paho.client.mqttv3.MqttCallback;
import org.eclipse.paho.client.mqttv3.MqttClient;
import org.eclipse.paho.client.mqttv3.MqttConnectOptions;
import org.eclipse.paho.client.mqttv3.persist.MemoryPersistence;

public class SampleMQTTCBA implements MqttCallback {
    public static final int KEEP_ALIVE_INTERVAL = 30;

    public static void main(String[] args) {
        String topic = "45a10ad4-ada7-4698-bc2b-d8ce1e1eb5c6/device/profile_inventory";
        try {
            MqttClient client = new MqttClient("ssl://<hostname>:8883",
                      "clientId",
                      new MemoryPersistence());

            MqttConnectOptions options = getMqttConnectOptions();
            client.setCallback(new SampleMQTTCBA());

            client.connect(options);
```
client.subscribe(topic, 0);

if (client.isConnected()) {
    System.out.println("Client connected");
}
client.unsubscribe(topic);
client.disconnect();
client.close();
} catch (Exception exception) {
    exception.printStackTrace();
}

private static MqttConnectOptions getMqttConnectOptions() throws Exception {
    MqttConnectOptions options = new MqttConnectOptions();
    options.setKeepAliveInterval(KEEP_ALIVE_INTERVAL);
    options.setCleanSession(false);

    String caFile = "<ca-cert.pem file path>";
    String p12File = "<End user's P12 file path>";
    String p12Password = "<P12 password>";

    final SSLContext sslContext = getSslContext(caFile, p12File, p12Password);
    options.setSocketFactory(sslContext.getSocketFactory());
    return options;
}

private static SSLContext getSslContext(final String caCrtFile, final String p12File, final String password) throws Exception {
    Security.addProvider(new BouncyCastleProvider());
    try {
        KeyManagerFactory kmf = getKeyManagerFactory(p12File, password);
        TrustManagerFactory tmf = getTrustManagerFactory(caCrtFile);

        SSLContext context = SSLContext.getInstance("TLSv1.2");
        context.init(kmf.getKeyManagers(), tmf.getTrustManagers(), null);
        return context;
    } catch (Exception e) {
        e.printStackTrace();
        System.err.println("Could not create SSL context");
        throw new IllegalArgumentException();
    }
}

private static KeyManagerFactory getKeyManagerFactory(String p12File, String password) throws Exception {
    KeyStore clientStore = KeyStore.getInstance("PKCS12");
    clientStore.load(new FileInputStream(p12File), password.toCharArray());

    KeyManagerFactory kmf = KeyManagerFactory.getInstance(KeyManagerFactory.getDefaultAlgorithm());

kmf.init(clientStore, password.toCharArray());
return kmf;
}

private static TrustManagerFactory getTrustManagerFactory(String caCrtFile) throws Exception {
    // load CA certificate
    X509Certificate caCert = null;

    FileInputStream fis = new FileInputStream(caCrtFile);
    BufferedInputStream bis = new BufferedInputStream(fis);
    CertificateFactory cf = CertificateFactory.getInstance("X.509");

    while (bis.available() > 0) {
        caCert = (X509Certificate)cf.generateCertificate(bis);
    }

    // CA certificate is used to authenticate server
    KeyStore caKs = KeyStore.getInstance(KeyStore.getDefaultType());
    caKs.load(null, null);
    caKs.setCertificateEntry("ca-certificate", caCert);
    TrustManagerFactory tmf = TrustManagerFactory.getInstance("X509");
    tmf.init(caKs);
    return tmf;
}

public void connectionLost(Throwable cause) {
    System.out.println("Demo.connectionLost()");
    cause.printStackTrace();
}

public void messageArrived(String topic, MqttMessage message) throws Exception {
    System.out.println("Demo.messageArrived()" + topic + " " + message);
}

public void deliveryComplete(IMqttDeliveryToken token) {
    System.out.println("message id" + token.getMessageId());
}
}
API characteristics

Endpoint information

The endpoints differ between MobileIron Cloud and MobileIron Core for certificate-based authentication, and between basic authentication and certificate authentication for MobileIron Cloud.

NOTE: The CPS API is unsupported on MobileIron Connected Cloud

The following table summarizes the endpoints:

<table>
<thead>
<tr>
<th>Authentication</th>
<th>MobileIron Cloud</th>
<th>MobileIron Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic</td>
<td>https://&lt;fully-qualified-hostname&gt;/msa/v1/cps</td>
<td>For both basic and certificate-based authentication:</td>
</tr>
<tr>
<td></td>
<td>For example, given the fully qualified hostname, na1.mobileiron.com, the endpoint address would be: <a href="https://na1.mobileiron.com/msa/v1/cps">https://na1.mobileiron.com/msa/v1/cps</a></td>
<td>https://&lt;fully-qualified-hostname&gt;/msa/v1/cps</td>
</tr>
<tr>
<td></td>
<td>For example, given the fully qualified hostname, acme.mobileiron.com, then the endpoint address would be: <a href="https://acme.mobileiron.com/msa/v1/cps">https://acme.mobileiron.com/msa/v1/cps</a></td>
<td>For example, given the fully qualified hostname, acme.mobileiron.com, then the endpoint address would be: <a href="https://acme.mobileiron.com/msa/v1/cps">https://acme.mobileiron.com/msa/v1/cps</a></td>
</tr>
<tr>
<td>Certificate</td>
<td><a href="https://cps-">https://cps-</a>&lt;clustername&gt;.mobileiron.com/msa/v1/cps</td>
<td>When using certificate-based authentication, you must include the identity certificate in every API call and when establishing a connection to MQTT. See Example MobileIron Cloud certificate-based authentication cURL command for how to include the certificate. See Certificate-based authentication workflows for how to set up certificate-based authentication.</td>
</tr>
</tbody>
</table>
NOTE: These endpoints listen on port 443.

Example MobileIron Cloud certificate-based authentication cURL command

curl -X GET 'https://cps-na1.mobileiron.com/msa/v1/cps/version'
- -cert <End user's P12 file path>/<End user's P12 filename>.p12:<End user's P12 file pass-
word>
- -cert-type p12
- -cacert <ca-cert.pem file path>

P12 in the snippet above refers to p12 authentication certificates. See Certificate-based authentication workflows for how to set up certificate-based authentication.

Aggregate API rate limits per cluster

MobileIron recommends integrators manage and control the call rate of CPS APIs so as to not exceed the following maximum values of calls per minute. Aggregate API call rates per cluster that exceed the following limits may result in rate-limiting being invoked:

<table>
<thead>
<tr>
<th>Tenants</th>
<th>Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NA1</td>
</tr>
<tr>
<td>msa/v1/cps/device/application</td>
<td>300*</td>
</tr>
<tr>
<td>msa/v1/cps/device/mac</td>
<td>100</td>
</tr>
<tr>
<td>/msa/v1/cps/device?status=&lt;DeviceStatus&gt;&amp;offset=&lt;Integer&gt;&amp;limit=&lt;Integer&gt;&amp;ruleId=&lt;rule&gt;</td>
<td>200</td>
</tr>
<tr>
<td>/msa/v1/cps/user?uid=&lt;user-id&gt;&amp;offset=&lt;offset&gt;&amp;limit=&lt;limit&gt;</td>
<td>100</td>
</tr>
<tr>
<td>/msa/v1/cps/device/forceCheckin</td>
<td>100</td>
</tr>
<tr>
<td>/msa/v1/cps/device/notification</td>
<td>200</td>
</tr>
<tr>
<td>/msa/v1/cps/device/email</td>
<td>200</td>
</tr>
<tr>
<td>Remaining APIs</td>
<td>400</td>
</tr>
</tbody>
</table>

* Values are calls/minute.
Batch ID recommendation

MobileIron recommends limiting to 100 the number of IDs sent with a single API call. The maximum number of IDs supported with any single API call is 200. API performance may degrade if more than 100 IDs are sent in any single API call and rate limiting may be invoked on MI Cloud.

Pulling data

- API calls only return properties that have a value and where the parameter is supported in the data model. For the complete list of properties, see Object models on page 27.
- The API calls return all date fields as a long: number of milliseconds since the epoch - January 1, 1970 UTC.

Common items

The following data structures are used across multiple APIs.

List of identifiers

A list of strings, device UEM identifiers, deviceGuid identifiers, device mac addresses, user Globally, or Universally Unique identifiers.

List of devices format

```json
{
  "identifiers":["mdm-id-1", "mdm-id-2"]
}
```

Example list of devices

```json
{
  "compliant":true,
  "quarantined": false,
  "compromised": false,
  "status":"ACTIVE",
  "lastCheckInTime":1469176919585,
  "registrationTime":1466449519230,
  "identifier":"24f048d3ec2b1d9f97921588f114b7f1fe9da35b685750bd072b395ba716",
  "imei": "35 234234234234 64 1",
  "macAddress":"08:d4:2b:1f:1b:2a",
  "manufacturer":"samsung",
  "model":"Nexus 10",
  "os":"ANDROID",
  "osVersion":"5.1.1",
  "serialNumber": "F123431WN123",
}
```
Number result

Number results are single integer responses whose meanings vary depending on the API call, for example, the count of updated entities or the response of a count API.

Example number result

```
{
    "result": 2
}
```

Update attributes

These handle both device and user attributes updates.

Update attributes request format

```
{
    "identifiers": [
        "id-1",
        "id-2"
    ],
    "attributes": {
        "key": "value"
    }
}
```
 Enums

<table>
<thead>
<tr>
<th>Enum</th>
<th>Values</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>AccountSource</td>
<td>LOCAL, LDAP</td>
<td>User # accountSource</td>
</tr>
<tr>
<td>DevicePlatform</td>
<td>ANDROID, IOS, OSX, WINDOWS, UNKNOWN</td>
<td>Device # os</td>
</tr>
<tr>
<td>DeviceStatus</td>
<td>ACTIVE, RETIRED, WIPED, WIPE_SENT, UNKNOWN, RETIRE_SENT, ENROLLMENT_PENDING</td>
<td>Device # status</td>
</tr>
</tbody>
</table>

Object models

The following sections describe the response fields you will encounter using the APIs.

NOTE: Do not perform strict type checking against the API JSON responses because MobileIron may enhance the responses with additional fields in subsequent releases.

App Catalog

<table>
<thead>
<tr>
<th>Field name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Human readable name.</td>
</tr>
<tr>
<td>platformType</td>
<td>Type of OS platform.</td>
</tr>
<tr>
<td>version</td>
<td>Application version.</td>
</tr>
<tr>
<td>identifier</td>
<td>Application (unique) identifier.</td>
</tr>
<tr>
<td>buildNumber</td>
<td>Build number of the application. This is for in-house apps only.</td>
</tr>
<tr>
<td>createdAt</td>
<td>Time app was added.</td>
</tr>
</tbody>
</table>
## Application

<table>
<thead>
<tr>
<th>Field name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>identifier</td>
<td>Application (unique) identifier</td>
</tr>
<tr>
<td>name</td>
<td>Human readable name</td>
</tr>
<tr>
<td>version</td>
<td>Application version</td>
</tr>
<tr>
<td>managed</td>
<td>Is the application managed.</td>
</tr>
<tr>
<td>source</td>
<td>Source of the app, for example, PUBLIC.</td>
</tr>
<tr>
<td>adHocCodeSigned</td>
<td>true or false</td>
</tr>
<tr>
<td>appStoreVendable</td>
<td>true or false</td>
</tr>
<tr>
<td>betaApp</td>
<td>true or false</td>
</tr>
<tr>
<td>deviceBasedVPP</td>
<td>true or false</td>
</tr>
<tr>
<td>externalVersionIdentifier</td>
<td>The external version identifier, for example, 832990878.</td>
</tr>
<tr>
<td>updateAvailable</td>
<td>true or false</td>
</tr>
<tr>
<td>installing</td>
<td>true or false</td>
</tr>
<tr>
<td>validated</td>
<td>true or false</td>
</tr>
<tr>
<td>shortVersion</td>
<td>The short version, for example, 5.2.1.</td>
</tr>
<tr>
<td>bundleVersion</td>
<td>The bundle version, for example, 6733.</td>
</tr>
</tbody>
</table>

## Certificate

<table>
<thead>
<tr>
<th>Field name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>identity</td>
<td>Indicates the certificate is an identity certificate.</td>
</tr>
<tr>
<td>notAfter</td>
<td>Epoch time after which certificate expires.</td>
</tr>
<tr>
<td>notBefore</td>
<td>Epoch time before which certificate is not valid.</td>
</tr>
</tbody>
</table>
### issuer
DName of the certificate issuer organization.

### serialNumber
Unique identification number for the certificate.

### subject
DName of the client to which the certificate belongs.

### thumbprint
The thumbprint is a hexadecimal string uniquely identifying a certificate. A thumbprint algorithm calculates the thumbprint. CES accepts Secure Hash Algorithm 1 (SHA-1) thumbprints in the 40-digit hexadecimal string form without spaces.

## Device
Note: imei, imsi and macAddress may not be present in all devices.

<table>
<thead>
<tr>
<th>Field name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>compliant</td>
<td>&quot;true&quot; if the device meets the compliance rules established by the MobileIron enterprise administrator, else &quot;false&quot;.</td>
</tr>
<tr>
<td>quarantined</td>
<td>&quot;true&quot; if the device is violating any policy with respect to quarantine action for device.</td>
</tr>
<tr>
<td>blocked</td>
<td>&quot;true&quot; if the device is violating a defined policy that has a compliance action.</td>
</tr>
<tr>
<td>compromised</td>
<td>&quot;true&quot; if the device OS is compromised as defined by rules established by the MobileIron enterprise administrator, for example, iOS device is jailbroken or an Android device is rooted.</td>
</tr>
<tr>
<td>status</td>
<td>Device registration state; one of:</td>
</tr>
<tr>
<td></td>
<td>ACTIVE</td>
</tr>
<tr>
<td></td>
<td>RETIRED</td>
</tr>
<tr>
<td></td>
<td>WIPED</td>
</tr>
<tr>
<td></td>
<td>WIPE_SENT</td>
</tr>
<tr>
<td></td>
<td>UNKNOWN</td>
</tr>
<tr>
<td></td>
<td>RETIRE_SENT</td>
</tr>
<tr>
<td></td>
<td>ENROLLMENT_PENDING</td>
</tr>
<tr>
<td>lastCheckInTime</td>
<td>The timestamp of the last device check in (number of milliseconds from the epoch). This is the UEM check in time.</td>
</tr>
<tr>
<td>registrationTime</td>
<td>The timestamp of the device registration (number of milliseconds from the epoch).</td>
</tr>
<tr>
<td>identifier</td>
<td>The unique device UEM identifier for the device in question. UEM identifiers are consistent within an OS, but are not consistently formatted across OSs. This identifier is not present for MAM only and</td>
</tr>
<tr>
<td>Field name</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Auth only devices because MDM is required in order to provide this information. Use deviceGuid, described below, which is more reliably available.</td>
<td></td>
</tr>
<tr>
<td>macAddress</td>
<td>The device’s MAC address, six groups of two hexadecimal digits separated by colons e.g. b0:65:bd:33:fe:2b. Available and valid only after the system fires the device.report_initialized event immediately after device enrollment.</td>
</tr>
<tr>
<td>manufacturer</td>
<td>Device manufacturer, e.g. samsung, Apple Inc. or MicrosoftMDG</td>
</tr>
<tr>
<td>model</td>
<td>Device model, e.g. Nexus 10, iPad3,1 or Lumia 950 Dual SIM</td>
</tr>
<tr>
<td>os</td>
<td>The devices operating system; one of: ANDROID IOS OSX WINDOWS UNKNOWN</td>
</tr>
<tr>
<td>osVersion</td>
<td>The OS version.</td>
</tr>
<tr>
<td>serialNumber</td>
<td>Device serial number.</td>
</tr>
<tr>
<td>userId</td>
<td>User name of the user the device belongs to.</td>
</tr>
<tr>
<td>userUuid</td>
<td>User unique identifier, can be used with user APIs like Update user attributes on page 81.</td>
</tr>
<tr>
<td>iosUdid</td>
<td>The UDID number for iOS device.</td>
</tr>
<tr>
<td>deviceGuid</td>
<td>The device GUID of the device.</td>
</tr>
<tr>
<td>customAttributes</td>
<td>All custom device attribute fields that have been set with a value for the device will be listed.</td>
</tr>
<tr>
<td>ownership</td>
<td>Indicates whether the device is company-owned or employee-owned, or the ownership type is unknown. Returns one of the following values: COMPANY, EMPLOYEE, UNKNOWN</td>
</tr>
<tr>
<td>imei</td>
<td>The device International Mobile Station Equipment Identity number. See <a href="http://www.imei.info/faq-what-is-IMEI/">http://www.imei.info/faq-what-is-IMEI/</a>.</td>
</tr>
<tr>
<td>imsi</td>
<td>The IMSI number for the device.</td>
</tr>
<tr>
<td>phoneNumber</td>
<td>Phone number.</td>
</tr>
</tbody>
</table>
## Device event

<table>
<thead>
<tr>
<th>Field name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>timestamp</td>
<td>milliseconds since the epoch: January 1, 1970</td>
</tr>
<tr>
<td>eventType</td>
<td>one of the following:</td>
</tr>
</tbody>
</table>
|              | • device.report_initialized  
|              |     Fired only when the device enrolls and the UEM server receives          |
|              |     the security status of the device. If the Security status changes,      |
|              |     the UEM server processes the change, but does not fire this event.      |

**NOTE:** For Android devices managed by MobileIron Cloud, to include the IMEI value in Android devices' device.report_initialized events, go to Admin > Android → Registration on the MobileIron Cloud Admin portal and enable Require Android device identifiers during registration (Work Profile & Device Admin). This is supported for Android 6.0 devices and above.

<table>
<thead>
<tr>
<th>Field name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>devices</td>
<td>A list of devices.</td>
</tr>
</tbody>
</table>

## Profile

<table>
<thead>
<tr>
<th>Field name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>encrypted</td>
<td>Indicates whether the profile payload content is encrypted or not</td>
</tr>
<tr>
<td>hasRemovalPasscode</td>
<td>Indicates whether the profile has a removal passcode</td>
</tr>
<tr>
<td>managed</td>
<td>Indicates whether the profile is managed by MobileIron</td>
</tr>
<tr>
<td>removalDisallowed</td>
<td>Supervised only. If present and set to true, the user cannot delete the</td>
</tr>
<tr>
<td>Field name</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>profile</td>
<td>(unless the profile has a removal password and the user provides it)</td>
</tr>
<tr>
<td>content</td>
<td>Array of payload dictionaries. Not present if 'encrypted' is true.</td>
</tr>
<tr>
<td>description</td>
<td>A description of the profile</td>
</tr>
<tr>
<td>displayName</td>
<td>Friendly name that identifies the entity.</td>
</tr>
<tr>
<td>identifier</td>
<td>A reverse-DNS style identifier (com.example.myprofile, for example) that identifies the profile</td>
</tr>
<tr>
<td>organization</td>
<td>A human-readable string containing the name of the organization that provided the profile</td>
</tr>
<tr>
<td>uuid</td>
<td>A globally unique identifier for the profile</td>
</tr>
<tr>
<td>version</td>
<td>The version number of the profile format</td>
</tr>
</tbody>
</table>

### Rules

These are the rules used to create device groups on MobileIron Cloud and labels on MobileIron Core.

<table>
<thead>
<tr>
<th>Field name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Unique identifier for rule group</td>
</tr>
<tr>
<td>name</td>
<td>Rule name</td>
</tr>
<tr>
<td>description</td>
<td>Rule group description</td>
</tr>
<tr>
<td>definition</td>
<td>Filter criteria for rule</td>
</tr>
</tbody>
</table>

### User

<table>
<thead>
<tr>
<th>Field name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>enabled</td>
<td>Indicates whether or not the user is enabled in the system.</td>
</tr>
<tr>
<td>createdAt</td>
<td>Epoch time when the user was on-boarded into the system.</td>
</tr>
<tr>
<td>accountSource</td>
<td>AccountSource enum.</td>
</tr>
<tr>
<td>displayName</td>
<td>Display name of the user.</td>
</tr>
<tr>
<td>emailAddress</td>
<td>Registered email address of the user.</td>
</tr>
<tr>
<td>Field name</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>firstName</td>
<td>User first name.</td>
</tr>
<tr>
<td>lastName</td>
<td>User last name.</td>
</tr>
<tr>
<td>userId</td>
<td>User name. This is the field by which you can search or count users.</td>
</tr>
<tr>
<td>userUuid</td>
<td>User unique identifier, to be used for the API call, Update user attributes on page 81.</td>
</tr>
<tr>
<td>customAttributes</td>
<td>All custom user attribute fields that have been set with a value for the user will be listed.</td>
</tr>
<tr>
<td>ldapCustomAttributes</td>
<td>All LDAP custom attribute fields that have been set with a value for the LDAP user will be listed.</td>
</tr>
</tbody>
</table>

**Handling Paged Responses**

When making calls that return a large number of results as a list, it will often be of benefit to page the result set. By requesting smaller subsets of data, you will get a response much faster than when requesting the entire, potentially large, data set.

On calls that support result set paging, pass in the following parameters to control size and start point of the page:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>offset</td>
<td>The index of the first item for which you want results.</td>
</tr>
<tr>
<td>limit</td>
<td>The maximum number of items you want to be included in the result set. Note that there may be less remaining items than the value you specify here. The default limit is 50.</td>
</tr>
</tbody>
</table>

To page through the results, begin with a start value of 0 and a count value of N. To get the next page, set start value to N, while the count value stays the same. Subsequent pages will start at 2N, 3N, 4N, et cetera.
Inventory APIs

Get application inventory

This API returns the application inventory for the device identifier(s) specified in the request. This API consists of a command and optional payload (URL) that you can use to work with GUIDs instead of mdm-identifiers. This call silently ignores invalid device identifiers in the request.

NOTE: The app inventory response depends on the device mode on Android and data privacy permissions on iOS.

To enable this API call to retrieve Windows 10 device data on MobileIron Core, see Enabling Windows 10 app inventory reporting on MobileIron Core on page 89.

HTTP Method

POST

Request URI

/msa/v1/cps/device/application

Request parameters
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>identifiers</td>
<td>Required</td>
<td>&quot;identifiers&quot;: &quot;[e428c618933372785b0641d053c562021ef9cd49]&quot;</td>
</tr>
<tr>
<td></td>
<td>Parameter Type: Request body</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data Type: String</td>
<td></td>
</tr>
<tr>
<td></td>
<td>List of UEM identifiers in this format:</td>
<td>{</td>
</tr>
<tr>
<td></td>
<td>&quot;identifiers&quot;: [&quot;mdm-id-1&quot;, &quot;mdm-id-2&quot;]</td>
<td>}</td>
</tr>
<tr>
<td></td>
<td>See List of identifiers on page 25.</td>
<td></td>
</tr>
<tr>
<td>identifierType</td>
<td>Optional</td>
<td>&quot;identifierType&quot;: &quot;MDM_IDENTIFIERS&quot;</td>
</tr>
<tr>
<td></td>
<td>Parameter Type: Request body</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data Type: Enum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Possible Values: One of:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• MDM_IDENTIFIERS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• GUID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If not specified, the server assumes MDM identifiers.</td>
<td></td>
</tr>
</tbody>
</table>

Response fields

See Application on page 28.

Example request

curl --location --request POST 'https://[MobileIron Cloud or Core]/msa/v1/cps/device/application' \  
--header 'Authorization: Basic xxxxxEBzYW5kYm94Lm1vYmlsZWIyb24uY29tOk1pNGIhbjEx' \  
--header 'Content-Type: application/json' \  
--data-raw '{"identifiers": ["e428c618933372785b0641d053c562021ef9cd49"]}'

Example response

[  
  {  
    "deviceMdmId": "e428c618933372785b0641d053c562021ef9cd49",  
    "applications": [  
      
      
    ]  
  ]
Get certificate inventory (iOS only)

This call gets the certificate inventory for the iOS device identifiers specified in the request. This call silently ignores any invalid identifiers passed.

HTTP Method

POST
Request URI
/msa/v1/cps/device/certificate

Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
</table>
| identifiers | Required<br>Parameter Type: Request body<br>Data Type: String<br>List of UEM identifiers in this format:<br>{<br>"identifiers": ["mdm-id-1", "mdm-id-2"]<br>}
|             | See List of identifiers on page 25.                                         |              |

Response fields

Example response
```
[
  {
    "deviceMdmId": "1cdacac686e39dd367a47f2286be436df0a37433",
    "certificates": [
      {
        "identity": true,
        "notAfter": 1812011724000,
        "notBefore": 1496740310000,
        "issuer": "CN=ppp819.auto.acme.com,OU=iOSMDMCA,UID=1496738424913",
        "serialNumber": "1017",
        "subject": "CN=1cdacac686e39dd367a47f2286be436df0a37433",
        "thumbPrint": "BF0670CFC5B548D5837E9D078F4617D296C9577E"
      },
      {
        "identity": false,
        "notAfter": 2035213580000,
```
"notBefore": 1088528780000,
"issuer": "C=US,O=The Go Daddy Group\\, Inc.,OU=Go Daddy Class 2 Certification Authority",
"serialNumber": "0",
"subject": "C=US,O=The Go Daddy Group\\, Inc.,OU=Go Daddy Class 2 Certification Authority",
"thumbPrint": "2796BAE63F1801E277261BA0D77770028F20EEE4"
},
{
"identity": false,
"notAfter": 2442818116000,
"notBefore": 1496738116000,
"issuer": "CN=ppp819.auto.acme.com,OU=SystemRootCA,UID=1496738416965",
"serialNumber": "750514842",
"subject": "CN=ppp819.auto.acme.com,OU=SystemRootCA,UID=1496738416965",
"thumbPrint": "C3EA70EB304FCD0500FF0369EC06103CF1C0260E"
},
{
"identity": true,
"notAfter": 1812011720000,
"notBefore": 1496740332000,
"issuer": "CN=ppp819.auto.acme.com,OU=AppStoreFrontCA,UID=1496738420411",
"serialNumber": "1018",
"subject": "CN=1cdacac686e39dd367a47f2286be436df0a37433",
"thumbPrint": "C45966CC2222CC85457D2C614B264ACE89EA683A"
}
]}

Get profile inventory (iOS only)

This calls returns the profile inventory details for the device identifiers specified in the request. This API consists of a command and optional payload (URL) that you can use to work with GUIDs instead of mdm-identifiers.

Any invalid device identifier specified in the request is silently ignored.

HTTP Method

POST

Request URI

/msa/v1/cps/device/profile
## Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>identifiers</td>
<td>Required Parameter Type: Request body</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data Type: String</td>
<td></td>
</tr>
<tr>
<td></td>
<td>List of UEM identifiers in this format:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>{</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;identifiers&quot;: [&quot;mdm-id-1&quot;, &quot;mdm-id-2&quot;]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>}</td>
<td></td>
</tr>
<tr>
<td></td>
<td>See List of identifiers on page 25.</td>
<td></td>
</tr>
<tr>
<td>identifierType</td>
<td>Optional Parameter Type: Request body</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data Type: Enum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Possible Values: One of:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• MDM_IDENTIFIERS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• GUID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If not specified, the server assumes MDM identifiers.</td>
<td></td>
</tr>
</tbody>
</table>

## Response fields

See Profile on page 31.

## Example response

```
[
  {
    "deviceMdmId": "8bfb639c2676ed8c4d55c8962773698fe2e04cd4",
    "profiles": [
      {
        "encrypted": true,
        "hasRemovalPasscode": false,
        "managed": true,
        "removalDisallowed": true,
        "description": "Access the Apple App Catalog via this Web Clip.",
        "displayName": "Apple App Catalog",
        "identifier": "mi.webclip.35016.0",
      }
    ]
  }
]```
Get profile inventory (iOS only)

"organization": "acme, Inc.",
"uuid": "e45473ff-bc98-4041-a220-94019fd2b9d9",
"version": "1"
}
{
"encrypted": true,
"hasRemovalPasscode": false,
"managed": true,
"removalDisallowed": true,
"description": "The Identity used by this device to access the Apple App Catalog securely.",
"displayName": "Identity for the App Catalog",
"identifier": "mi.credentialidentitydg.35018.0",
"organization": "acme, Inc.",
"uuid": "5d299f56-6dbb-4318-9f53-39e8a78950f1",
"version": "1"
}
{
"encrypted": true,
"hasRemovalPasscode": false,
"managed": false,
"removalDisallowed": false,
"description": "The top-level MDM payload containing the MDM profile, the identities and the trust certificates necessary to MDM-manage this device.",
"displayName": "Root MDM Profile",
"identifier": "com.acme.polaris.mdm",
"organization": "acme, Inc.",
"uuid": "3cdac85c-d56d-4d75-835c-dce062d66c9e",
"version": "1"
}
Device APIs

Please note that for any of the device GET APIs, the value returned by the API corresponds to the device state at the last device check-in. If you would like to get the most up to date value, then include a Force checkin call in your work-flow.

Get device attributes metadata

This call returns available device attributes and their types. Some fields such as devicestatus and deviceplatform will have a value from a finite known set. See Enums on page 27 for all such fields.

HTTP Method

GET

Request URI

/msa/v1/cps/device/$metadata

Example response

```json
[
  {
    "name": "compliant",
    "dataType": "boolean",
    "readOnly": true
  },
  {
    "name": "status",
    "dataType": "devicestatus",
    "readOnly": true
  },
  {
    "name": "lastCheckInTime",
    "dataType": "long",
    "readOnly": true
  },
  {
    "name": "macAddress",
```
Get devices by UEM or deviceGuid identifiers

This API returns the details of devices with the UEM or deviceGuid identifiers specified in the request body. It silently ignores invalid UEM and deviceGuid identifiers. In the following device details return, the UEM identifier is in the field "identifier," and the deviceGuid is in the field,"deviceGuid." Those are the values, for example, "d0838fa7ba1ee023c9ece9192589088325d7aa08" and "dbccbe70-7499-4676-88b0-a6d6d298752e" that you could use in the body of this call.

{  
  "compliant": true,  
  "quarantined": false,  
  "blocked": false,  
  "compromised": false,  
  "status": "ACTIVE",  
  "lastCheckInTime": 1581229664468,  
  "registrationTime": 1581229603492,  
  "identifier": "d0838fa7ba1ee023c9ece9192589088325d7aa08",  
  "macAddress": "8c:fe:57:b3:53:96",  
  "manufacturer": "Apple Inc." ,
"model": "iPad7,5",
"os": "iOS",
"osVersion": "13.3",
"serialNumber": "GG7XP285JMVT",
"userId": "b2@m.com",
"userUuid": "b8e7fe0a-4730-4bc5-a089-cfd631078b9e",
"iosUdid": "d083fa7ba1ee023c9ece9192589088325d7aa08",
"ownership": "UNKNOWN",
"deviceGuid": "dbccbe70-7499-4676-88b0-a6d5d298752e"
}

HTTP Method

POST

Request URI

/msa/v1/cps/device/uuid

Request parameters
## Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>identifierType</td>
<td>Required Parameter Type: Request body Data Type: String Type of identifier. Valid values:</td>
<td>{ &quot;identifierType&quot;:&quot;MDM_IDENTIFIER&quot;, &quot;identifierType&quot;:&quot;GUID&quot; }</td>
</tr>
<tr>
<td>identifiers</td>
<td>Required Parameter Type: Request body Data Type: String List of UEM identifiers in this format:</td>
<td>{ &quot;identifierType&quot;:&quot;MDM_IDENTIFIER&quot;, &quot;identifiers&quot;:[&quot;mdm-id-1&quot;, &quot;mdm-id-2&quot;] }</td>
</tr>
<tr>
<td></td>
<td></td>
<td>{ &quot;identifierType&quot;:&quot;GUID&quot;, &quot;identifiers&quot;:[&quot;deviceGuid-1&quot;, &quot;deviceGuid-2&quot;] }</td>
</tr>
<tr>
<td></td>
<td></td>
<td>{ &quot;identifierType&quot;:&quot;GUID&quot;, &quot;identifiers&quot;:[&quot;dbccbe70-7499-4676-88b0-a6d5d298752e&quot;] }</td>
</tr>
</tbody>
</table>

See List of identifiers on page 25.

### Response fields

A list of devices.

See List of identifiers on page 25 and User on page 32.

### Example request

```
curl --location --request POST 'https://<mobileiron_cloud/msa/v1/cps/device/uuid' \
--header 'Authorization: Basic xxxxxdXNlckBtb2JpbGVpc9uLmNvbTpNaTRtYW4xMQ==' \
```
Example response

```json
[
  {
    "compliant": true,
    "quarantined": false,
    "blocked": false,
    "compromised": false,
    "status": "ACTIVE",
    "lastCheckInTime": 1581229664468,
    "registrationTime": 1581229603492,
    "identifier": "d0838fa7ba1ee023c9ece9192589088325d7aa08",
    "macAddress": "8c:fe:57:b3:53:96",
    "manufacturer": "Apple Inc.",
    "model": "iPad7,5",
    "os": "IOS",
    "osVersion": "13.3",
    "serialNumber": "GG7XP2853MVT",
    "userId": "b2@m.com",
    "userUuid": "b8e7fda0-4730-4bc5-a089-cfd631078b9e",
    "iosUdid": "d0838fa7ba1ee023c9ece9192589088325d7aa08",
    "ownership": "UNKNOWN",
    "deviceGuid": "dbccbe70-7499-4676-88b0-a6d5d298752e"
  }
]
```

Get devices by mac addresses

This API returns the details of devices with MAC addresses specified in the request. It silently ignores invalid MAC addresses.

HTTP Method

POST

Request URI

/msa/v1/cps/device/mac
Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>identifiers</td>
<td>Required</td>
<td></td>
</tr>
<tr>
<td>Parameter Type: Request body</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Type: String</td>
<td></td>
<td></td>
</tr>
<tr>
<td>List of wifi MAC identifiers in this format:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>{</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;identifiers&quot; : [&quot;mac-id-1&quot;, &quot;macm-id-2&quot;]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>See List of identifiers on page 25.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Response fields

A list of devices.

See List of identifiers on page 25 and User on page 32.

Search devices by status

This API returns the device information for devices with status specified in the request. If no status is specified in the request, details of all the devices is returned.

HTTP Method

GET

Request URI

/msa/v1/cps/device?status=<DeviceStatus>&offset=<Integer>&limit=<Integer>
Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>status</td>
<td>Parameter Type: Query&lt;br&gt;Data Type: String</td>
<td>See status on page 29.</td>
</tr>
<tr>
<td>offset</td>
<td>Parameter Type: Query&lt;br&gt;Data Type: Number&lt;br&gt;Default: 0</td>
<td>0</td>
</tr>
<tr>
<td>limit</td>
<td>Parameter Type: Query&lt;br&gt;Data Type: String&lt;br&gt;Default: 50</td>
<td>50</td>
</tr>
</tbody>
</table>

Response fields

A list of devices.

See List of identifiers on page 25 and User on page 32.

Example response

```json
{
    "searchResults": #List of devices,
    "results": 2,
    "offset": 0,
    "limit": 50
}
```

Search devices by device group identifier

This API returns device membership details for device group identifier specified in the search request.

HTTP Method

GET
Request URI

/msa/v1/cps/device?ruleId=<id>&offset=<Offset>&limit=<Limit>

Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Required</td>
<td>38089</td>
</tr>
<tr>
<td></td>
<td>Parameter Type: Query</td>
<td>Data Type: String</td>
</tr>
<tr>
<td>offset</td>
<td>Parameter Type: Query</td>
<td>Data Type: Number</td>
</tr>
<tr>
<td>limit</td>
<td>Parameter Type: Query</td>
<td>Data Type: String</td>
</tr>
</tbody>
</table>

Response fields

A list of devices.

See List of identifiers on page 25 and User on page 32.

Example response

```json
{
  "searchResults": [
    {
      "compliant": true,
      "quarantined": false,
      "blocked": false,
      "compromised": false,
      "status": "ACTIVE",
      "lastCheckInTime": 1516619820303,
      "registrationTime": 1516619792690,
      "identifier": "f4aadce56d25edffghh4958484brr1c35f6b6d5",
      "imei": "6733284512443420",
    }
  ]
}
```
Get device location details

This API returns device location details of the target device.

HTTP Method

POST

Request URI

/msa/v1/cps/device/location

Request parameters

"macAddress": "fa:c6:7b:0f:eb:ff",
"manufacturer": "Apple Inc.",
"model": "iPhone6,1",
"os": "IOS",
"osVersion": "10.1",
"phoneNumber": "7171046951",
"serialNumber": "d028d4db2162",
"userId": "testuser@auto.automation.com",
"userUuid": "047rdee6-31c1-4e55a-898d-97de620d5f22",
"iosUdid": "f4aadce56d25edffggh4958484brr1c35f6b6d5",
"ownership": "UNKNOWN",
"customAttributes": {
  "nacCompliant": "false"
}
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>identifiers</td>
<td>Required Parameter Type: Request body Data Type: String List of UEM identifiers in this format:</td>
<td></td>
</tr>
</tbody>
</table>

```json
{
  "identifiers": ["mdm-id-1", "mdm-id-2"]
}
```

See List of identifiers on page 25.

**Example response**

```json
[
  {
    "deviceMdmId": "id-1",
    "lastCaptured": 1525260287000,
    "location": {
      "latitude": "-6.446318",
      "longitude": "8.305312"
    }
  },
  {
    "deviceMdmId": "id-2",
    "lastCaptured": 1525260287000,
    "location": {
      "latitude": "5.178482",
      "longitude": "240.943423"
    }
  }
]
```

**Count devices by status**

This API returns the count of devices with status specified in the request. If no status is specified in the request, count of all the devices is returned.

**HTTP Method**

GET
Request URI

/msa/v1/cps/device/count?status=<DeviceStatus>

Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>status</td>
<td>Parameter Type: Query, Data Type: String</td>
<td>See status on page 29.</td>
</tr>
</tbody>
</table>

Response fields

A number result.

See Number result on page 26.

Count devices by device group identifier

This API returns device membership count for device group identifier specified in the search request.

HTTP Method

GET

Request URI

/msa/v1/cps/device/count?ruleId=<id>

Request parameters
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Required</td>
<td>38089</td>
</tr>
<tr>
<td></td>
<td>Parameter Type: Query</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data Type: String</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ID of the device group whose member devices to count.</td>
<td></td>
</tr>
</tbody>
</table>

**Response fields**

A number result.

See [Number result on page 26](#).

**Example response**

```json
{
   "result": 1
}
```

**Update device attributes by device UEM identifiers**

This API is used to update attributes for the device identifiers specified in the request. It returns the count of devices for which the attributes were successfully updated.

**HTTP Method**

POST

**Request URI**

/msa/v1/cps/device

**Request parameters**

List of update attributes.

See [Update attributes on page 26](#).
Response fields

API returns the count of devices for which attributes were successfully updated along with HTTP status 200.

See Number result on page 26.

Manage device settings - iOS only

This API updates specific iOS settings based on the device identifiers in the request. The supported settings are:

- Personal hotspot
- Data roaming

NOTE: Mobile data needs to be switched on in the device to allow enabling of the hotspot. WiFi and Bluetooth are not required for enablement, but for other devices to connect to the hotspot.

The API returns the count of devices for which the settings was successfully updated. The call silently ignores any invalid device identifiers specified in the request.

HTTP Method

POST

Request URI

/msa/v1/cps/device/settings
## Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
</table>
| identifiers | Required | Parameter Type: Request body  
Data Type: String  
List of UEM identifiers in this format:  
{  
"identifiers":["mdm-id-1", "mdm-id-2"]  
}  
See [List of identifiers on page 25](#). |
| settings | Required | Parameter Type: Request body  
Data Type: String  
JSON container for the type and value parameters. |
| type | Required | Parameter Type: Request body  
Data Type: String  
The settings to update.  
Can be:  
- PERSONAL_HOTSPOT  
- DATA_ROAMING |
<p>| value | Required | {} |</p>
<table>
<thead>
<tr>
<th>Parameter Type: Request body</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
</table>
| **Data Type:** String         | The value to set for the settings. Can be: • true • false | "identifiers": [  "b9a0d7d05fb4204f52264f805932526b848ca61d"  ],  "settings": {  "type": "PERSONAL_HOTSPOT",  "value": {  "enabled": true  }  }

### Response fields

API returns the count of devices for which attributes were successfully updated along with HTTP status 200.

See Number result on page 26.

### Example requests

**Turn on personal hotspot:**

```
POST /msa/v1/cps/device/settings
{
    "identifiers": [
        "b9a0d7d05fb4204f52264f805932526b848ca61d"
    ],
    "settings": {
        "type": "PERSONAL_HOTSPOT",
        "value": {
            "enabled": true
        }
    }
}
```

**Turn off data roaming:**

```
POST /msa/v1/cps/device/settings
{
    "identifiers": [
        "b9a0d7d05fb4204f52264f805932526b848ca61d"
    ],
```
"settings": {
  "type": "DATA_ROAMING",
  "value": {
    "enabled": false
  }
}
}

Example response
{
  "result": 1
}

In case all the identifiers are invalid, then response code will still be 200, with result as 0.

Get device settings - iOS only

This API returns values for data roaming and personal hotspot received on the last device check in. If you would like the most up to date value, then include a Force checkin call in your work-flow. The supported settings are:
- Personal hotspot
- Data roaming

HTTP Method
POST

Request URI
/msa/v1/cps/device/getDeviceSettings
Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>identifiers</td>
<td>Required</td>
<td></td>
</tr>
</tbody>
</table>
Parameter Type: Request body
Data Type: String
List of UEM identifiers in this format:

```
{  
  "identifiers": ["mdm-id-1", "mdm-id-2"]
}
```

See List of identifiers on page 25.

| settingsType | Required | 
Parameter Type: Request body
Data Type: String
The settings to retrieve.
Can be:
• PERSONAL_HOTSPOT
• DATA_ROAMING

```
{  
  "settingsType": "DATA_ROAMING",
  "identifiers": [  
    "b9a0d7d05fb4204f52264f805932526b848ca61d",
    "a9a0d7d05fb4204f52264f805932526b848ca61d"
  ]
}
```

Response fields

API returns the count of devices for which attributes were successfully updated along with HTTP status 200.

See Number result on page 26.

Example request

```
POST /msa/v1/cps/device/settings
{
  "settingsType": "DATA_ROAMING",
  "identifiers": [
```
Example response

```json
{
    "settings": [
        {
            "identifier": "b9a0d7d05fb4204f52264f805932526b848ca61d",
            "settings": {
                "type": "DATA_ROAMING",
                "value": {
                    "enabled": false
                }
            }
        },
        {
            "identifier": "a9a0d7d05fb4204f52264f805932526b848ca61d",
            "settings": {
                "type": "DATA_ROAMING",
                "value": {
                    "enabled": true
                }
            }
        }
    ]
}
```

In case all the identifiers are invalid, then response code will still be 200, with an empty response body.

**Force checkin**

This API is used to initiate force check-in from the server for the device identifiers specified in the request. Invalid device identifiers are silently ignored. The API returns the count of devices for which force check-in action was successfully initiated.
HTTP Method

POST

Request URI

/msa/v1/cps/device/forceCheckin

Request parameters

List of UEM identifiers.

See List of identifiers on page 25.

Response fields

Success: HTTP Status 200, and a number result with the count of successfully checked in devices.

See Number result on page 26

Check-in for Threat Response Matrix update

Mobile Threat Detection vendors use this API to notify their agent in our integrated client to immediately check-in with their management service to receive the latest Threat Response Matrix (TRM). This ensures that their agent is working with the most recent application, network, and device threat information, rather than waiting for the next regularly scheduled check-in event. This API consists of a command and optional payload (URL) that vendors can use to work with GUIDs instead of mdm-identifiers. The API returns the count of devices for which the push notification action successfully initiated. The API silently ignores invalid device identifiers specified in the request.

HTTP Method

POST

Request URI

/msa/v1/cps/device/mtd/notification
Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| command    | **Required**<br>**Parameter Type:** Request body  
**Data Type:** String  
**Possible value:** CHECKIN <br>Command to be forwarded to Mobile Treat Defense vendor. |
| identifierType | **Optional**<br>**Parameter Type:** Request body  
**Data Type:** Enum  
**Possible Values:** One of:<br>• MDM_IDENTIFIERS  
• GUID <br>If not specified, the server assumes MDM identifiers. |
| identifiers | **Required**<br>**Parameter Type:** Request body  
**Data Type:** String  
List of mdm identifiers in this format:<br>{ "identifiers": ["mdm-id-1", "mdm-id-2"] }  
See List of identifiers on page 25. |
| url        | **Optional**<br>**Parameter Type:** Request body  
**Data Type:** String  
URL to be forwarded to Mobile Treat Defense vendor. |

Response fields

Success: HTTP Status 200, and a number result with the count of successfully checked in devices.

See Number result on page 26
Example request payload

```json
{
    "command": "CHECKIN",
    "URL": "http://example.com/example",
    "identifiers": [
        "mdm-id-1",
        "mdm-id-2"
    ]
}
```

Example response

```json
{
    "result": 2
}
```

In case all the identifiers are invalid, then response code will still be 200, with result as 0.
Device Group APIs

Device groups are containers for logically grouping devices for the ease of device management. Device Groups are “device groups” on MobileIron Cloud and “labels” on MobileIron Core. See Example device groups API scenario for an example of how you can use these calls to calculate specific group device characteristics.

Get all Device Groups

This call returns device groups information for device groups existing in the system and includes system-defined, statically or manually managed, and dynamically managed device group information. Device groups correspond to rule IDs.

HTTP Method

GET

Request URI

/msa/v1/cps/rule?offset=<Offset>&limit=<Limit>

Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
</table>
| offset    | Parameter Type: Query  
Data Type: String  
Default: 0  
Breaks results into chunks. The syntax is offset=value. | 5 |
| limit     | Parameter Type: Query  
Data Type: String  
Default: 50  
Limits the return to the specified number of rows. | 25 |
Response fields

A list of device groups.

See Rules.

Example response

{
    "searchResults": [
        {
            "id": 38089,
            "name": "rule1",
            "description": "Rule 1 Description",
            "definition": "PLATFORMTYPE EQ 'IOS'"
        },
        {
            "id": 38090,
            "name": "rule2",
            "description": "Rule 2 Description",
            "definition": "PLATFORMTYPE EQ 'IOS'"
        }
    ],
    "results": 2,
    "offset": 0,
    "limit": 10
}

Get device groups associated with device list

This call returns a list of device groups and related information associated with a list of devices. Device groups correspond to rule IDs.

HTTP Method

POST

Request URI

/msa/v1/cps/rule/deviceGuid
Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>identifiers</td>
<td>Required Parameter Type: Request body, Data Type: String</td>
<td>List of device GUIDs identifiers in this format:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>{</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;identifiers&quot;: [</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;deviceGuid&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>}</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See List of identifiers on page 25.</td>
</tr>
</tbody>
</table>

Response fields

A list of device groups.

See Rules.

Example request

```bash
curl --location --request POST 'https://[mobileiron-Cloud-or-Core]/msa/v1/cps/rule/deviceGuid' "
   --header 'Accept: application/json, text/plain, */*' "
   --header 'Content-Type: application/json' "
   --header 'Authorization: Basic xxxxxEBzYW5kYm94Lm1vYmlsZWRlyb24uY29tOkN1bHE=' "
   --data-urlencode "
      "identifiers": [ |
      "6b8df48e-7778-4a33-97e4-1cc6b39de61c"
      ] |
```

Example response

```json
{
   "errors": null,
```
"result": [
  {
    "deviceGuid": "6b8df48e-7778-4a33-97e4-1cc6b39de61c",
    "rules": [
      {
        "id": 51173,
        "name": "jk Sandbox User Group",
        "definition": "DISPLAYNAME EQ 'jk Sandbox User'"
      },
      {
        "id": 390113,
        "name": "test#2",
        "definition": "CURRENTMCC NEQ 'test#'"
      },
      {
        "id": 361609,
        "name": "Bozo",
        "definition": "UNLOCK_TOKEN EQ 'TRUE'"
      },
      {
        "id": 40165,
        "name": "All Devices",
        "description": "Targets any type of device."
      },
      {
        "id": 118493,
        "name": "current country",
        "definition": "CURRENTCOUNTRYNAME EQ 'United States'"
      },
      {
        "id": 40167,
        "name": "iOS Devices",
        "description": "Targets all iOS devices",
        "definition": "PLATFORMTYPE EQ 'IOS'"
      }
    ]
  }
]
Request URI

/msa/v1/cps/rule?name=<name>&offset=<Offset>&limit=<Limit>

Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Required</td>
<td>iOS</td>
</tr>
<tr>
<td></td>
<td>Parameter Type: Query</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data Type: String</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The prefix string of the device group name on which to perform the search. Not context sensitive. No records are returned if this parameter is blank.</td>
<td></td>
</tr>
</tbody>
</table>

Response fields

A list of device groups.

See Rules.

Example response

```json
{
    "searchResults": [ 
        {
            "id": 38089,
            "name": "rule1",
            "description": "Rule 1 Description",
            "definition": "PLATFORMTYPE EQ 'IOS'"
        },
        {
            "id": 38090,
            "name": "rule2",
            "description": "Rule 2 Description",
            "definition": "CFDEVICE[nacCompliant] EQ 'false'"
        }
    ],
    "results": 2,
    "offset": 0,
    "limit": 10
}
```
Get device group by device group identifier

This call returns device group details for the device group identifier specified in the request.

HTTP Method

GET

Request URI

/msa/v1/cps/rule/<id>

Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Required</td>
<td>38089</td>
</tr>
<tr>
<td>Parameter Type: Query</td>
<td>Data Type: String</td>
<td></td>
</tr>
<tr>
<td>The device group ID on which to search. You can use the call, Get all Device Groups on page 62, or the call, Search device groups by device group name on page 65, to find the device group id.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Response fields

Rule information for the device group identifier specified.

See Rules.

Example response

```json
{
    "id": 38089,
    "name": "rule1",
    "description": "Rule 1 Description",
    "definition": "PLATFORMTYPE EQ 'IOS'"
}
```
Example device groups API scenario

You can use the device group APIs to calculate device group characteristics, such as the percentage of Android Enterprise-enrolled devices. Remember that device groups are “device groups” on MobileIron Cloud, and “labels” on MobileIron Core.

Example

1. First, use the Get all Device Groups call to get a list of all the device groups, so you know which device groups you can use for your calculations.

   Call:
   GET msa/v1/cps/rule

   Response:

   ```json
   {
     "searchResults": [
       {
         "id": 38000,
         "name": "All Devices",
         "description": "Targets any type of device."
       },
       {
         "id": 38001,
         "name": "Android Devices",
         "description": "Targets all Android devices",
         "definition": "PLATFORMTYPE EQ 'ANDROID'"
       },
       {
         "id": 38002,
         "name": "Android Enterprise Devices",
         "description": "Targets all Android Enterprise devices",
         "definition": "PLATFORMTYPE EQ 'ANDROID' AND ANDROIDWORKENABLED EQ 'true'"
       },
       {
         "id": 38003,
         "name": "iOS Devices",
         "description": "Targets all iOS devices",
         "definition": "PLATFORMTYPE EQ 'IOS'"
       },
       {
         "id": 38004,
         "name": "Windows Devices",
         "description": "Targets all Windows devices",
         "definition": "PLATFORMTYPE EQ 'WINDOWS_PHONE'"
       },
       {
         "id": 38005,
         "name": "macOS Devices",
         "description": "Targets all macOS devices",
         "definition": "PLATFORMTYPE EQ 'MACOS'"
       }
   ]
   ```
Example device groups API scenario

```
"description": "Targets all OSX devices",
"definition": "PLATFORMTYPE EQ 'OSX'"
},
{
  "id": 38006,
  "name": "tvOS Devices",
  "description": "Targets all tvOS devices.",
  "definition": "PLATFORMTYPE EQ 'IOS' AND MODEL STARTS_WITH 'AppleTV')"
}
```

2. Use the Count devices by device group identifier call to find the total android device count.

   Call:
   GET : /msa/v1/cps/device?ruleId=38001

   Note that ruleId 38001 targets all Android devices.

3. Use the Count devices by device group identifier and then the number of Android Enterprise-enrolled devices.

   Call:
   GET : /msa/v1/cps/device?ruleId=38002

   Note that ruleId 38002 targets all Android Enterprise-enrolled devices.

4. Using the two values returned by the preceding two calls, you can calculate the percentage of Android devices that are also Android Enterprise-enrolled devices.
Message APIs

Send email to device owners

This API is used to send email notification to device owners by specifying device identifiers in the request. The API returns the count of devices for which the send email action was successfully initiated. Any invalid device identifier specified in the request is silently ignored.

HTTP Method

POST

Request URI

/msa/v1/cps/device/email

Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>subject</td>
<td><strong>Parameter Type</strong>: Request body</td>
<td>Please backup your device.</td>
</tr>
<tr>
<td></td>
<td><strong>Data Type</strong>: String</td>
<td>Subject of the email. Character limit is 100.</td>
</tr>
<tr>
<td>body</td>
<td><strong>Parameter Type</strong>: Request body</td>
<td>Please backup your device to ensure against data loss.</td>
</tr>
<tr>
<td></td>
<td><strong>Data Type</strong>: String</td>
<td>Body of the email. Character limit is 3000.</td>
</tr>
<tr>
<td>html</td>
<td><strong>Parameter Type</strong>: Request body</td>
<td>true</td>
</tr>
<tr>
<td></td>
<td><strong>Data Type</strong>: Boolean</td>
<td>Specifies whether the email is in HTML format.</td>
</tr>
<tr>
<td>identifiers</td>
<td>Required</td>
<td></td>
</tr>
</tbody>
</table>
Send push notification to devices

This API is used to send notifications by specifying device identifiers in the request. The API returns the count of devices for which the push notification action was successfully initiated. Any invalid device identifier specified in the request is silently ignored.

**HTTP Method**

POST

**Request URI**

/msa/v1/cps/device/notification

**Request parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data Type</strong>: String</td>
<td>List of UEM identifiers in this format:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>{</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;identifiers&quot;: [&quot;mdm-id-1&quot;, &quot;mdm-id-2&quot;]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>}</td>
<td></td>
</tr>
<tr>
<td></td>
<td>See List of identifiers on page 25.</td>
<td></td>
</tr>
</tbody>
</table>

See List of identifiers on page 25.

**Response fields**

Success: HTTP Status 200

See Number result on page 26.
## Parameter Details

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
</table>
| message  | **Parameter Type:** Request body  
**Data Type:** String  
Content of push message. Character limit is 140. | Please backup your device. |
| identifiers | Required  
**Parameter Type:** Request body  
**Data Type:** String  
List of UEM identifiers in this format:  
{  
"identifiers": ["mdm-id-1", "mdm-id-2"]  
}  
See List of identifiers on page 25. | |

## Response fields

**Success:** HTTP Status 200

See Number result on page 26.
User APIs

This chapter describes the Common Platform Services API calls you use to query and manipulate MobileIron users.

Get user attributes metadata

Get user attributes metadata

This call returns available user attributes and their types.

HTTP Method

GET

Request URI

/msa/v1 cps/user/$metadata

Example response

[
  {
    "name": "enabled",
    "dataType": "boolean",
    "readOnly": true
  },
  {
    "name": "createdAt",
    "dataType": "long",
    "readOnly": true
  },
  {
    "name": "accountSource",
    "dataType": "string",
    "readOnly": true
  },
  {
    "name": "displayName",
    "dataTo-Type": "string",
    "readOnly": true
  },
Get user attributes metadata

```json
{
    "name": "ios",
    "dataType": "string",
    "readOnly": false
}
```
Search users by GUID

This call searches for users by GUID. See User on page 32. This call returns custom LDAP attributes along with other user information, unless issued with the fields="ldapStandardAttributes" parameter, which adds LDAP standard attributes to the response.

HTTP Method

GET

Request URI

/msa/v1/cps/user?guid=<string>&fields="ldapStandardAttributes"

Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>guid</td>
<td>Parameter Type: Query, Data Type: String</td>
<td>dd8b7006-2780-49c1-9b03-f85aa57c9da4</td>
</tr>
<tr>
<td>fields=&quot;ldapStandardAttributes&quot;</td>
<td>Optional, Parameter Type: Query, Data Type: String</td>
<td>fields=&quot;ldapStandardAttributes&quot;</td>
</tr>
</tbody>
</table>
|                            | If this parameter is included, the return includes the following standard LDAP attributes: | • distinguishedName  
• samAccountName  
• userPrincipalName |

Response fields

A list of users.
See List of identifiers on page 25 and User on page 32.

Example responses

Local accountSource

```json
{
  "searchResults": [ 
  {
    "enabled": true,
    "createdAt": 1580812767902,
    "accountSource": "LOCAL",
    "displayName": "John Doe",
    "emailAddress": "admin@acme.com",
    "firstName": "John",
    "lastName": "Doe",
    "userId": "admin@acme.com",
    "userUuid": "dd8b7006-2780-49c1-9b03-f85aa57c9da4",
    "guid": "dd8b7006-2780-49c1-9b03-f85aa57c9da4"
  },
  "results": 1,
  "offset": 0,
  "limit": 50
}
```

LDAP accountSource with fields="ldapStandardAttributes" parameter included in the call

```json
{
  "limit": 50,
  "offset": 0,
  "results": 1,
  "searchResults": [ 
  {
    "accountSource": "LDAP",
    "createdAt": 1500444347689,
    "displayName": "Fred A",
    "emailAddress": "Freda@auto8.mobileiron.com",
    "enabled": true,
    "firstName": "Fred",
    "ldapCustomAttributes": {
      "lastlogontimestamp": "131516814255658414",
      "mailnickname": "Fred",
      "mdbusedefaults": "TRUE",
      "msexchmailboxguid": "k\u00f8fffd\u00f8ffdv\u00f8ffdn\u00f8fffd\u00f8ffds)\u289e=",
      "msexchrecipientdisplaytype": "1073741824",
      "msexchwhennemailboxcreated": "20140407185418.0Z"
    }
  }
  ]
}
```
Search users by user id

This call searches for users by user IDs by searching for users whose user ID starts with the given string. See User on page 32. This call returns custom LDAP attributes along with other user information, unless issued with the fields="ldapStandardAttributes" parameter, which adds LDAP standard attributes to the response. Note that the call searches only on the email address as the user ID.

HTTP Method

GET

Request URI

/msa/v1/cps/user?uid=<String>&fields="ldapStandardAttributes"&offset=<Offset>&limit=<Limit>

Request parameters
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>uid</td>
<td>Parameter Type: Query Data Type: String</td>
<td>The email prefix, for example, the “btarris” in “:<a href="mailto:btarris@mobileiron.com">btarris@mobileiron.com</a>.”</td>
</tr>
<tr>
<td>fields=&quot;ldapStandardAttributes&quot;</td>
<td>Optional Parameter Type: Query Data Type: String</td>
<td>fields=&quot;ldapStandardAttributes&quot;</td>
</tr>
<tr>
<td>offset</td>
<td>Parameter Type: Query Data Type: Number Default: 0</td>
<td>0</td>
</tr>
<tr>
<td>limit</td>
<td>Parameter Type: Query Data Type: String Default: 50</td>
<td>50</td>
</tr>
</tbody>
</table>

**Response fields**

A list of users.

See List of identifiers on page 25 and User on page 32.

**Example responses**

**Local accountSource**

```json
{
  "searchResults": [
    {
      "enabled": true,
      "createdAt": 1466202626423,
      "accountSource": "LOCAL",
      "displayName": "JGB",
      "emailAddress": "abc@mobileiron.com",
      "firstName": "Josh",
    }
  ]
}```
"lastName": "Brit",
"userId": "abc@mobileiron.com",
"userUuid": "0aed8d85-6dfd-40ac-b3b5-82f629e3c168"
},
{
"enabled": true,
"createdAt": 1466525975950,
"accountSource": "LOCAL",
"displayName": "Bob Tarris",
"emailAddress": "btarris@mobileiron.com",
"firstName": "Bob",
"lastName": "Tarris",
"userId": "btarris@mobileiron.com",
"userUuid": "b7149c70-30ef-4b88-b8f3-82f629e3c168"
},
{
"enabled": true,
"createdAt": 1467161380058,
"accountSource": "LOCAL",
"displayName": "Bob Tarris",
"emailAddress": "btarris@mobileiron.com",
"firstName": "Bob",
"lastName": "Tarris",
"userId": "btarris@mobileiron.com",
"userUuid": "b7149c70-30ef-4b88-b8f3-82f629e3c168"
}
],
"results": 3,
"offset": 0,
"limit": 10
}

LDAP accountSource with fields="ldapStandardAttributes" parameter included in the call

{  
"limit": 50,
"offset": 0,
"results": 1,
"searchResults": [
{

"accountSource": "LDAP",
"createdAt": 1500444347689,
"displayName": "Fred A",
"emailAddress": "Freda@auto8.mobileiron.com",
"enabled": true,
"firstName": "Fred",
"lastName": "Fred A",
"userUuid": "0aed8d85-6dfd-40ac-b3b5-82f629e3c168",
"custom_user": "from rest 2"
}
],
"results": 1,
"offset": 0,
"limit": 50
}
Count users by user id

This call counts users by user IDs by searching for users whose user ID starts with the given string. See User on page 32. Note that the call searches only on the email address as the user ID.

HTTP Method

GET

Request URI

/msa/v1/cps/user/count?uid=<String>

Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>uid</td>
<td>Parameter Type: Query</td>
<td><a href="mailto:jilldoe@acme.com">jilldoe@acme.com</a></td>
</tr>
<tr>
<td></td>
<td>Data Type: String</td>
<td></td>
</tr>
</tbody>
</table>

Response fields

A number result of users whose user id starts with the given string.
See Number result on page 26.

**Update user attributes**

This API is used to update attributes for the user identifiers specified in the request. It returns the count of users for which the attributes were successfully updated. The API silently ignores any invalid user identifiers specified in the request body.

**HTTP Method**

POST

**Request URI**

/msa/v1/cps/user

**Request parameters**

List of update attributes.

See Update attributes on page 26.

**Response fields**

Count of users for which attributes were successfully updated.

See Number result on page 26.
App Catalog APIs

Get application inventory

This API returns information about the apps in the app catalog.

HTTP Method

GET

Request URI

/msa/v1/cps/appcatalog/apps

Request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>identifier</td>
<td>Parameter Type: Query Data Type: String</td>
<td>com.facebook.Facebook</td>
</tr>
<tr>
<td></td>
<td>Bundle id of the application (exact match).</td>
<td></td>
</tr>
<tr>
<td>name</td>
<td>Parameter Type: Query Data Type: String</td>
<td>Facebook</td>
</tr>
<tr>
<td></td>
<td>Name of the app (matches starts with)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note: This parameter is case sensitive. See <a href="#">this known issue</a>.</td>
<td></td>
</tr>
<tr>
<td>platformType</td>
<td>Parameter Type: Query Data Type: String</td>
<td>iOS</td>
</tr>
<tr>
<td></td>
<td>Type of the os platform (exact match). Case sensitive. Must be one of these values:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• IOS</td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Sample Value</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· OSX</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· ANDROID</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· WINDOWS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· WEBAPPS</td>
</tr>
</tbody>
</table>

WEBAPPS is only supported for MobileIron Core. WINDOWS is not working in this release. See this known issue.

Response fields

See App Catalog on page 27.

Example request

/msa/v1/cps/appstore/apps

Example responses

```json
{
    "searchResults": [
        {
            "name": "Google Photos",
            "platformType": "Android",
            "version": "2019.02.19",
            "identifier": "com.google.android.apps.photos",
            "createdAt": 1550659389308
        },
        {
            "name": "Facebook",
            "platformType": "iOS",
            "version": "208.0",
            "identifier": "com.facebook.Facebook",
            "createdAt": 1550659372336
        },
        {
            "name": "Windows Scan",
            "platformType": "Windows",
            "identifier": "Microsoft.WindowsScan_8wekyb3d8bbwe",
            "createdAt": 1550659437232
        },
        {
            "name": "MAC Address Scan",
            "platformType": "Mac OS X",
```
Get application inventory

In-house app response

Note that this response contains the buildNumber field, available only for in-house apps.

```json
{
    "searchResults": [  
        {
            "name": "HAC-Extension",
            "platformType": "iOS",
            "version": "1.4.2.0.0.17",
            "identifier": "com.mobileiron.enterprise.HAC-Extension",
            "buildNumber": "1.4.2.0.0.17",
            "createdAt": 1550660326185
        }
    ],
    "results": 11,
    "offset": 0,
    "limit": 50
}
```
Metadata APIs

Get current minor version of the API

This call gets the current minor version of the API.

HTTP Method

GET

Request URI

/msa/v1/cps/version

Response fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>minorVersion</td>
<td>A string representing the minor version of the target API.</td>
</tr>
</tbody>
</table>

Example response

```json
{
    "minorVersion": "1.0.0"
}
```
Get device registration URI

This API returns the URL used to register the device for a user.

HTTP Method

GET

Request URI

/msa/v1/cps/device/registration

Example responses

MobileIron Cloud

{  "registrationUrl": "https://mobileiron_cloud_host/ireg/index.html" }

MobileIron Core

{  "registrationUrl": "https://mobileiron_core_host/go" }

Get device app metadata

This API returns the device app metadata.

HTTP method

GET

Request URI

/msa/v1/cps/device/application/$metadata
Example response

```json
[
  {
    "name": "identifier",
    "dataType": "string",
    "readOnly": true
  },
  {
    "name": "name",
    "dataType": "string",
    "readOnly": true
  },
  {
    "name": "version",
    "dataType": "string",
    "readOnly": true
  }
]
```

Get device certificate metadata

This API returns the device certificate metadata.

HTTP method

GET

Request URI

/msa/v1/cps/device/certificate/$metadata

Example response

```json
[
  {
    "name": "identity",
    "dataType": "boolean",
    "readOnly": true
  },
  {
    "name": "notAfter",
    "dataType": "long",
    "readOnly": true
  }
]```
Get device certificate metadata

```json
]

{
    "name": "notBefore",
    "dataType": "long",
    "readOnly": true
},
{
    "name": "issuer",
    "dataType": "string",
    "readOnly": true
},
{
    "name": "serialNumber",
    "dataType": "string",
    "readOnly": true
},
{
    "name": "subject",
    "dataType": "string",
    "readOnly": true
},
{
    "name": "thumbPrint",
    "dataType": "string",
    "readOnly": true
}
```
Enabling Windows 10 app inventory reporting on MobileIron Core

To enable app inventory reporting for Windows 10:

1. Log into MobileIron Core, and then select **Policies and Configs**.
2. Select **Policies**.
3. Select **Privacy Policy**.
4. Click **Edit**.
5. Enable the following Windows 10 inventory settings:
   - App Store Inventory
   - Non Store Inventory
   - System Inventory
   - Win 32 Inventory
6. Click one of the **Save** buttons.