

# **EMV®**

## **3-D Secure**

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### **SDK - Device Information**

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# 1 Introduction

The 3-D Secure protocol is aimed at securing authentication in browser-based and mobile app-based transactions. The *EMV 3-D Secure Protocol and Core Functions Specification version 2.0.0* describes the 3-D Secure protocol and core functions.

The 3DS Mobile SDK is the mobile-device-side component of 3-D Secure. The *EMV 3-D Secure SDK Specification version 2.0.0* describes the specification for the 3DS SDK.

Device identification is used to uniquely identify mobile devices in the 3-D Secure ecosystem. The `ThreeDS2Service` interface is one of the code elements that are described in the *EMV 3-D Secure SDK Specification version 2.0.0*. The `initialize` method of this interface collects the information required for device identification. This information is then sent to the 3DS Requestor App in JSON format. The 3DS Requestor App passes this information to the 3DS Server. The 3DS Server uses this information to create an AReq.

## 1.1 Purpose

This document describes the device identification parameters that shall be collected by the 3DS SDK.

For purposes of this document, when the phrase 3-D Secure, and/or 3DS is utilised, the intent is EMV 3-D Secure.

## 1.2 Audience

This document is intended for use by implementers of the 3DS SDK.

## 1.3 Definitions

The following terms are used in this specification:

**Table 1.1: Definitions**

Term	Definition
3DS Requestor App	An App on a Consumer Device that can process a 3-D Secure transaction through the use of a 3DS SDK. The 3DS Requestor App is enabled through integration with the 3DS SDK.

Term	Definition
3DS SDK	3-D Secure Software Development Kit (SDK). A component that is incorporated into the 3DS Requestor App. The 3DS SDK performs functions related to 3-D Secure on behalf of the 3DS Server.
3DS Server	Refers to the 3DS Integrator's server or systems that handle online transactions and facilitates communication between the 3DS Requestor and the DS.
3-D Secure (3DS)	An e-commerce authentication protocol that enables the secure processing of payment and non-payment card transactions.
Access Control Server (ACS)	A component that operates in the Issuer Domain, that verifies whether authentication is available for a card number and device type, and authenticates specific Cardholders.
Authentication	In the context of 3-D Secure, the process of confirming that the person making an e-commerce transaction is entitled to use the payment card.
Authentication Request (AReq) Message	An EMV 3-D Secure message sent by the 3DS Server via the DS to the ACS to initiate the authentication process.
Authentication Response (ARes) Message	An EMV 3-D Secure message returned by the ACS via the DS in response to an Authentication Request message.
Card	In this specification, synonymous to the account of a payment card.
Cardholder	An individual to whom a card is issued or who is authorised to use that card.
Consumer Device	Device used by a Cardholder such as a smartphone, laptop, or tablet that the Cardholder uses to conduct payment activities including authentication and purchase.
Data Version	Specifies the set of device identification parameters that the 3DS SDK shall collect.
Device Data	Data provided by the consumer device that is used for the authentication process.
Device Information	Data provided by the Consumer Device that is used in the authentication process.

Term	Definition
Device Parameter Not Available (DPNA)	Indicates that the 3DS SDK was unable to collect a particular parameter.
Directory Server (DS)	A server component operated in the Interoperability Domain; it performs a number of functions that include: authenticating the 3DS Server, routing messages between the 3DS Server and the ACS, and validating the 3DS Server, the 3DS SDK, and the 3DS Requestor.
EMV	A term referring to EMVCo's specifications for global interoperability and acceptance of secure payment transactions and/or products and services complying with such specifications.
EMVCo	EMVCo, LLC, a limited liability company incorporated in Delaware, USA.
Frictionless	The process of authentication achieved without Cardholder interaction.
Frictionless Flow	A 3-D Secure flow that involves Cardholder interaction as defined in Section 2.5.1 in the <i>EMV 3-D Secure Protocol and Core Functions Specification</i> .
JavaScript Object Notation (JSON)	An open standard format that uses human-readable text to transmit data objects consisting of attribute-value pairs. It is typically used to transmit data between a server and web application. Refer to Table 1.1 in the <i>EMV 3-D Secure Protocol and Core Functions Specification</i> .
Merchant	Entity that contracts with an Acquirer to accept payment cards. Manages the online shopping experience with the Cardholder, obtains card number, and then transfers control to the 3DS Server, which conducts payment authentication.
Uniform Resource Locator (URL)	Address scheme for pages on the World Wide Web usually in the format <a href="http://www.example.com">http://www.example.com</a> or <a href="https://www.example.com">https://www.example.com</a> .

## 1.4 Abbreviations

The abbreviations listed in Table 1.2 are used in this specification.

**Table 1.2: Abbreviations**

Abbreviation	Description
3DS	Three Domain Secure
3DS SDK	Three Domain Secure Software Development Kit
ACS	Access Control Server
AReq	Authentication Request
ARes	Authentication Response
DD	Device Data
DPNA	Device Parameter Not Available
DV	Data version
SDK	Software Development Kit
SW	Security Warning

## 1.5 Terminology and Conventions

The following words are used often in this specification and have a specific meaning:

**Shall**

Defines a product or system capability which is mandatory.

**May**

Defines a product or system capability which is optional or a statement which is informative only and is out of scope for this specification.

**Should**

Defines a product or system capability which is recommended.

## 2 Device Identification Parameters

This chapter describes the device identification parameters that shall be collected by the 3DS SDK from all mobile platforms. These parameters are categorized as device-platform-specific parameters and parameters that are common to all device platforms.

**Note:** The 3DS SDK shall collect and pass the common parameters. This is the minimum requirement. In addition, the implementer shall ensure that the 3DS SDK collects as many device-platform-specific parameters as possible. The availability of a higher number of device parameters improves the effectiveness of risk-based decision making by the ACS. This, in turn, increases the probability of applying a frictionless flow.

### 2.1 Data Version

The data version specifies the set of device identification parameters that the 3DS SDK shall collect. The data version is a means for participating 3DS 2.0 components to know which set of device identification parameters is being transferred. The data version may change when, for example, there are parameter changes in future mobile OS versions, an existing parameter is deprecated, and so on.

The Data Version shall be included in the device identification information that is sent by the 3DS SDK.

The device identification parameters that are described in this document constitute Data Version 1.0.

### 2.2 Minimum Supported Platform Versions

Table 2.1 lists the minimum platform versions that shall be supported by the SDK.

**Table 2.1: Minimum Supported Platform Version**

Platform	Minimum Version
Android	KitKat 4.4 (API version 19)
iOS	8
Windows Phone	8.1

### 2.3 Platform Permissions for Parameters

The following types of permissions are required for collecting device identification parameters:

- **No permissions required:** Indicates that the device parameters can be directly collected by the 3DS SDK, without any user approval or system permissions.

- **Installation-time permissions:** Indicates that the device parameters require system permissions to be granted to the app during installation time.
- **Run-time permissions:** Indicates that the device parameters can be collected by the 3DS SDK only if the required permissions have already been granted to the app through user approval at run time.

The 3DS SDK shall check whether installation-time or run-time permission for a particular parameter is available or has already been granted to the app. If the permission for a particular parameter is not available, then the 3DS SDK shall send one of the reason codes stated in Table 2.6 as the value for the parameter within the Device Parameter Not Available (DPNA) tag.

**Note:** The 3DS SDK *shall never* prompt the user for run-time permissions. Similarly, the 3DS SDK *shall not* mandate the inclusion of additional installation-time permissions on the 3DS Requestor App.

## 2.4 Common Device Identification Parameters Available in All Platforms

In addition to the platform-specific device parameters discussed later in this document, Table 2.2 lists the device parameters that shall be collected from all mobile platforms for Device ID validation and risk analysis.

The availability of these parameters is subject to change in future OS versions.

**Note:** Each parameter listed in this table shall be collected by the SDK unless the parameter cannot be collected for any of the reasons stated in Table 2.6.

**Table 2.2: Common Parameters Available in Android, iOS and Windows Phone Platforms**

Identifier	Parameter	Description	Permissions
C001	Platform	Platform that the device is using. For example, Android, iOS, Windows Phone.	Not applicable.
C002	Device Model	Mobile device manufacturer and model. For example, In Android, Build.Model returns the model name.	No permissions required.

<b>Identifier</b>	<b>Parameter</b>	<b>Description</b>	<b>Permissions</b>
C003	OS Name	<p>Operating system name.</p> <p>For example, in iOS, the <code>systemName</code> property of the <code>UIDevice</code> class returns the name of the operating system.</p>	No permissions required.
C004	OS Version	<p>Operating system version.</p> <p>For example, in iOS, the <code>systemVersion</code> property of the <code>UIDevice</code> class returns the version of the operating system.</p>	No permissions required.
C005	Locale	<p>Device locale set by the user.</p> <p>For example, in Windows Phone, the <code>CurrentCulture</code> property of the <code>CultureInfo</code> class returns the locale.</p>	No permissions required.
C006	Time zone	<p>Device time zone.</p> <p>For example, in Android, the <code>TimeZone.getDefault()</code> method returns a time zone based on the time zone where the program is running.</p>	No permissions required.
C007	Advertising ID	<p>Unique ID available for advertising and fraud detection purposes.</p> <p>For example, in Windows Phone, <code>AdvertisingManager.AdvertisingId</code> retrieves a unique ID used to provide more relevant advertising.</p>	No permissions required.
C008	Screen Resolution	<p>Pixel width and pixel height, i.e., 1080x1920.</p> <p>For example, in Android, the screen resolution can be obtained from the <code>heightPixels</code> and <code>widthPixels</code> fields of the <code>DisplayMetrics</code> class.</p>	No permissions required.

<b>Identifier</b>	<b>Parameter</b>	<b>Description</b>	<b>Permissions</b>
C009	Device Name	User-assigned device name.  For example, in iOS, the <code>localizedModel</code> property of the <code>UIDevice</code> class returns the Device Name.	On Android, this parameter requires Bluetooth permission during installation.  No permissions required on iOS or Windows Phone.
C010	IP Address	IP address of device.	On Android, this parameter requires the following permissions during installation.  <code>android.permission.INTERNET</code> <code>android.permission.ACCESS_NETWORK_STATE</code>  No permissions required on iOS or Windows Phone.
C011	Latitude	Device physical location latitude.	Run-time permissions required on Android API 23 and later, iOS and Windows Phone.  Installation-time permissions required on Android 22 and earlier.
C012	Longitude	Device physical location longitude.	Run-time permissions required on Android API 23 and later, iOS and Windows Phone.  Installation-time permissions required on Android 22 and earlier.

## 2.5 Android-Specific Device Parameters

Table 2.3 provides information about the device parameters that shall be collected by the 3DS SDK from the Android mobile platform for risk analysis by the ACS.

In this table, the Group or Identifier column contains the name of the parameter group or parameter identifier.

**Table 2.3: Android-Specific Device Parameters**

Group or Identifier	Element	Description	Comments	Permissions
Telephony Manager		Telephony Manager provides access to information about the telephony services on the device.	This group of parameters requires the following permissions: <code>android.permission.SEND_SMS</code> <code>android.permission.READ_PHONE_STATE</code>  User approval is not required for API 22 and earlier because these permissions are granted during installation.	Run-time permissions
A001	DeviceId	Unique identifier of the device.  For example, IMEI for GSM phones and MEID or ESN for CDMA phones.		Run-time permissions
A002	SubscriberId	Unique subscriber ID.  For example, IMSI for GSM phones.		Run-time permissions
A003	IMEI/SV	IMEI software version.		Run-time permissions
A004	Group Identifier Level1	Group identifier level 1 for a GSM phone.	Available only for API 18 or higher.	Run-time permissions

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A005	Line1Number	Phone number string for line 1.  For example, the MSISDN for a GSM phone.		Run-time permissions
A006	MmsUAProfUrl	MMS user agent profile URL.	Available only for API 19 or higher.	Run-time permissions
A007	MmsUserAgent	MMS user agent.	Available only for API 19 or higher.	Run-time permissions
A008	NetworkCountryIso	ISO country code equivalent of the current registered operator's MCC (Mobile Country Code).		Run-time permissions
A009	NetworkOperator	Numeric name (mobile country code + mobile network code) of the current registered operator.		Run-time permissions
A010	NetworkOperatorName	Alphabetic name of the current registered operator.		Run-time permissions
A011	NetworkType	NETWORK_TYPE_xx xx for the current data connection.		Run-time permissions
A012	PhoneCount	Number of phones available. Returns 1 for single standby mode (single SIM functionality). Returns 2 for dual standby mode (dual SIM functionality).	Available only for API 23 or higher.	Run-time permissions

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A013	PhoneType	Constant that indicates the device phone type. This indicates the type of radio used to transmit voice calls.		Run-time permissions
A014	SimCountryIso	ISO country code equivalent for the SIM provider's country code.		Run-time permissions
A015	SimOperator	MCC+MNC (mobile country code + mobile network code) of the SIM provider.		Run-time permissions
A016	SimOperatorName	Service Provider Name (SPN).		Run-time permissions
A017	SimSerialNumber	Serial number of the SIM, if applicable.		Run-time permissions
A018	SimState	Constant that indicates the state of the default SIM card.		Run-time permissions
A019	VoiceMailAlphaTag	Alphabetic identifier associated with the voice mail number.		Run-time permissions
A020	VoiceMailNumber	Voice mail number.		Run-time permissions
A021	hasIccCard	Returns true if an ICC card is present.		Run-time permissions
A022	isHearingAidCompatibilitySupported	Indicates whether the phone supports hearing aid compatibility.	Available only for API 23 or higher.	Run-time permissions

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A023	isNetworkRoaming	Determines if the device is considered roaming on the current network, for GSM purposes.		Run-time permissions
A024	isSmsCapable	Determines if the current device supports SMS service.	Available only for API 21 or higher.	Run-time permissions
A025	isTtyModeSupported	Determines whether the phone supports TTY mode.	Available only for API 23 or higher.	Run-time permissions
A026	isVoiceCapable	Determines if the current device is "voice capable".	Available only for API 22 or higher.	Run-time permissions
A027	isWorldPhone	Determines whether the device is a world phone.	Available only for API 23 or higher.	Run-time permissions
WifiManager		WifiManager provides the primary API for managing all aspects of Wi-Fi connectivity.	This group of parameters requires the following permission: <code>android.permission.ACCESS_WIFI_STATE</code>	Installation-time permissions
A028	Wifi - Mac Address	Returns the wireless MAC address of the device.		Installation-time permissions
A029	BSSID	Returns the basic service set identifier (BSSID) of the current access point.		Installation-time permissions
A030	SSID	Returns the service set identifier (SSID) of the current 802.11 network.		Installation-time permissions

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A031	NetworkID	Each configured network has a unique small integer ID, used to identify the network when performing operations on the supplicant.		Installation-time permissions
A032	is5GHzBandsSupported	Determines if this adapter supports the 5 GHz band.	Available only for API 21 or higher.	Installation-time permissions
A033	isDeviceToAptRtSupported	Determines if this adapter supports Device-to-AP RTT.	Available only for API 21 or higher.	Installation-time permissions
A034	isEnhancedPowerReportingSupported	Determines if this adapter supports advanced power and performance counters.	Available only for API 21 or higher.	Installation-time permissions
A035	isP2pSupported	Determines if this adapter supports WiFiP2pManager.	Available only for API 21 or higher.	Installation-time permissions
A036	isPreferredNetworkOffloadSupported	Determines if this adapter supports offloaded connectivity scan.	Available only for API 21 or higher.	Installation-time permissions
A037	isScanAlwaysAvailable	Determines if scanning is always available.	Available only for API 18 or higher.	Installation-time permissions
A038	isTdlsSupported	Determines if this adapter supports Tunnel Directed Link Setup.	Available only for API 21 or higher.	Installation-time permissions

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
Bluetooth Manager		Bluetooth Manager is used to conduct overall Bluetooth Management.	This group of parameters requires following permission: <code>android.permission.BLUETOOTH</code>	Installation-time permissions
A039	BluetoothAdapter	Facilitates in performing fundamental Bluetooth tasks, such as initiate device discovery, query a list of bonded (paired) devices, instantiate a BluetoothDevice using a known MAC address, and create a BluetoothServerSocket to listen for connection requests from other devices, and start a scan for Bluetooth LE devices.	Available only for API 18 or higher.	Installation-time permissions
A040	Address	Hardware address of the local Bluetooth adapter.	Available only for API 18 or higher.	Installation-time permissions
A041	BondedDevices	Returns the set of BluetoothDevice objects that are bonded (paired) to the local adapter.	Available only for API 18 or higher.	Installation-time permissions
A042	isEnabled	Returns true if Bluetooth is currently enabled and ready for use.		Installation-time permissions

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
Build		Build is used to determine information about the current build, extracted from system properties.		No permissions required.
A043	BOARD	Name of the underlying board, such as "goldfish".		No permissions required.
A044	BOOTLOADER	System bootloader version number.		No permissions required.
A045	BRAND	Consumer-visible brand with which the product/hardware will be associated, if any.		No permissions required.
A046	DEVICE	Name of the industrial design.		No permissions required.
A047	DISPLAY	Build ID string that is displayed to the user.		No permissions required.
A048	FINGERPRINT	String that uniquely identifies this build.		No permissions required.
A049	HARDWARE	Name of the hardware (from the kernel command line or /proc).		No permissions required.
A050	ID	Either a changelist number, or a label like "M4-rc20".		No permissions required.
A051	MANUFACTURER	Manufacturer of the product/hardware.		No permissions required.

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A052	PRODUCT	Name of the overall product.		No permissions required.
A053	RADIO	Radio firmware version number.		No permissions required.
A054	SERIAL	Hardware serial number, if available.		No permissions required.
A055	SUPPORTED_32_BIT_ABIS	Ordered list of 32-bit ABIs supported by this device. The most preferred ABI is the first element in the list.	Available only for API 21 or higher.	No permissions required.
A056	SUPPORTED_64_BIT_ABIS	Ordered list of 64-bit ABIs supported by this device. The most preferred ABI is the first element in the list	Available only for API 21 or higher.	No permissions required.
A057	TAGS	Comma-separated tags describing the build, such as "unsigned, debug".		No permissions required.
A058	TIME	Build time.		No permissions required.
A059	TYPE	Type of build, such as "user" or "eng".		No permissions required.
A060	USER			No permissions required.

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
Build.VERSION		Indicates various version strings.		No permissions required.
A061	CODENAME	The current development codename, or the string "REL" if this is a release build.		No permissions required.
A062	INCREMENTAL	The internal value used by the underlying source control to represent this build.		No permissions required.
A063	PREVIEW_SDK_INT	The developer preview revision of a prerelease SDK.		No permissions required.
A064	SDK_INT	The user-visible SDK version of the framework; its possible values are defined in Build.VERSION_CODES.		No permissions required.
A065	SECURITY_PATCH	The user-visible security patch level.		No permissions required.
Settings.Secure		Secure system settings, containing system preferences that applications can read but are not allowed to write.		No permissions required.
A066	ACCESSIBILITY_DISPLAY_INVERSION_ENABLED	Specifies whether display color inversion is enabled.		No permissions required.

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A067	ACCESSIBILITY_ENABLED	Specifies whether accessibility is enabled.		No permissions required.
A068	ACCESSIBILITY_SPEAK_PASSWORD	Specifies whether to speak passwords while in accessibility mode.		No permissions required.
A069	ALLOWED_GEOLOCATION_ORIGINS	Origins for which browsers should allow geolocation by default. The value is a space-separated list of origins.		No permissions required.
A070	ANDROID_ID	64-bit number (as a hex string) that is randomly generated when the end user first sets up the device. This number should remain constant for the lifetime of the end user's device. The value may change if a factory reset is performed on the device.		No permissions required.
A071	DATA_ROAMING	Determines whether or not data roaming is enabled.	Available only for API 17 or higher.	No permissions required.
A072	DEFAULT_INPUT_METHOD	Setting to record the input method used by default.		No permissions required.
A073	DEVICE_PROVISIONED	Determines whether the device has been provisioned.	Available only for API 17 or higher.	No permissions required.

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A074	ENABLED_ACCESSIBILITY_SERVICES	List of enabled accessibility providers.		No permissions required.
A075	ENABLED_INPUT_METHODS	List of input methods that are currently enabled.		No permissions required.
A076	INPUT_METHOD_SELECTOR_VISIBILITY	Setting to record the visibility of the input method selector.		No permissions required.
A077	INSTALL_NON_MARKET_APPS	Specifies whether applications can be installed for this user via the system's ACTION_INSTALL_PACKAGE mechanism.		No permissions required.
A078	LOCATION_MODE	Degree of location access enabled by the end user.		No permissions required.
A079	SKIP_FIRST_USE_HINTS	If enabled, apps should try to skip any introductory hints on first launch.		No permissions required.
A080	SYS_PROP_SETTING_VERSION	Secure system settings, containing system preferences that applications can read but are not allowed to write.		No permissions required.
A081	TTS_DEFAULT_PITCH	Default text-to-speech engine pitch.		No permissions required.
A082	TTS_DEFAULT_RATE	Default text-to-speech engine speech rate.		No permissions required.

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A083	TTS_DEFAULT_SYNTH	Default text-to-speech engine.		No permissions required.
A084	TTS_ENABLED_PLUGINS	Space delimited list of plugin packages that are enabled.		No permissions required.
Settings Global		Global system settings, containing preferences that always apply identically to all defined users.		No permissions required.
A085	ADB_ENABLED	Specifies whether ADB is enabled.	Available only for API 17 or higher.	No permissions required.
A086	AIRPLANE_MODE_RADIOS	Comma-separated list of radios that need to be disabled when airplane mode is on.	Available only for API 17 or higher.	No permissions required.
A087	ALWAYS_FINISH_ACTIVITIES	If 1, the activity manager will aggressively finish activities and processes as soon as they are no longer needed.	Available only for API 17 or higher.	No permissions required.
A088	ANIMATOR_DURATION_SCALE	Scaling factor for animator-based animations.	Available only for API 17 or higher.	No permissions required.
A089	AUTO_TIME	Value to specify whether the user prefers the date, time and time zone to be automatically fetched from the network (NITZ).	Available only for API 17 or higher.	No permissions required.

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A090	AUTO_TIME_ZONE	Value to specify whether the user prefers the time zone to be automatically fetched from the network (NITZ).	Available only for API 17 or higher.	No permissions required.
A091	DEVELOPMENT_SETTINGS_ENABLED	Determines whether the end user has enabled development settings.	Available only for API 17 or 5 higher.	No permissions required.
A092	HTTP_PROXY	Host name and port for global http proxy.	Available only for API 17 or higher.	No permissions required.
A093	NETWORK_PREFERENCE	User preference for which networks should be used.	Available only for API 17 or higher.	No permissions required.
A094	STAY_ON_WHILE_PLUGGED_IN	Determines whether the device must remain switched on while it is plugged in.	Available only for API 17 or higher.	No permissions required.
A095	TRANSITION_ANIMATION_SCALE	Scaling factor for activity transition animations.	Available only for API 17 or higher.	No permissions required.
A096	USB_MASS_STORAGE_ENABLED	Indicates whether USB mass storage is enabled.	Available only for API 17 or higher.	No permissions required.
A097	USE_GOOGLE_MAIL	If this setting is set (to anything), then all references to Gmail on the device must change to Google Mail.	Available only for API 17 or higher.	No permissions required.

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A098	WAIT_FOR_DEBUGGER	If 1, when launching DEBUG_APP it will wait for the debugger before starting user code.	Available only for API 17 or higher.	No permissions required.
A099	WIFI_NETWORKS_AVAILABLE_NOTIFICATION_ON	Determines whether the end user should be notified of open networks.	Available only for API 17 or higher.	No permissions required.
Settings System		System settings, containing miscellaneous system preferences.		No permissions required.
A100	ACCELEROMETER_ROTATION	Control whether the accelerometer will be used to change screen orientation.		No permissions required.
A101	BLUETOOTH_DISCOVERABILITY	Determines whether remote devices may discover and/or connect to this device.		No permissions required.
A102	BLUETOOTH_DISCOVERABILITY_TIMEOUT	Bluetooth discoverability timeout.		No permissions required.
A103	DATE_FORMAT	Date format string mm/dd/yyyy dd/mm/yyyy yyyy/mm/dd.		No permissions required.
A104	DTMF_TONE_TYPE_WHEN_DIALING	CDMA only settings + DTMF tone type played by the dialer when dialing		No permissions required.

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A105	DTMF_TONE_WHEN_DIALING	Whether the audible DTMF tones are played by the dialer when dialing.		No permissions required.
A106	END_BUTTON_BEHAVIOR	The behavior when the user presses the end call button if they're not on a call.		No permissions required.
A107	FONT_SCALE	Scaling factor for fonts, float.		No permissions required.
A108	HAPTIC_FEEDBACK_ENABLE	Whether the haptic feedback (long presses) is enabled.		No permissions required.
A109	MODE_RINGER_STREAMS_AFFECTED	Determines which streams are affected by ringer mode changes.		No permissions required.
A110	NOTIFICATION_SOUND	Persistent store for the system-wide default notification sound.		No permissions required.
A111	MUTE_STREAMS_AFFECTED	Determines which streams are affected by mute.		No permissions required.
A112	RINGTONES	Persistent store for the system-wide default ringtone URI.		No permissions required.
A113	SCREEN_BRIGHTNESS	The screen backlight brightness between 0 and 255.		No permissions required.
A114	SCREEN_BRIGHTNESS_MODE	Control whether to enable automatic brightness mode.		No permissions required.

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A115	SCREEN_OFF_TIMEOUT	The amount of time in milliseconds before the device goes to sleep or begins to dream after a period of inactivity. This value is also known as the user activity timeout period since the screen isn't necessarily turned off when it expires.		No permissions required.
A116	SOUND_EFFECTS_ENABLED	Whether sounds effects (key clicks, lid open) are enabled.		No permissions required.
A117	TEXT_AUTO_CAPS	Setting to enable Auto Caps in text editors.		No permissions required.
A118	TEXT_AUTO_PUNCTUATE	Setting to enable Auto Punctuate in text editors		No permissions required.
A119	TEXT_AUTO_REPLACE	Setting to enable Auto Replace (AutoText) in text editors.		No permissions required.
A120	TEXT_SHOW_PASSWORD	Setting to showing password characters in text editors.		No permissions required.
A121	TIME_12_24	Display time in the 12-hour format or the 24-hour format.		No permissions required.
A122	USER_ROTATION	Default screen rotation when no other policy applies.		No permissions required.

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A123	VIBRATE_ON	Whether vibrate is on for different events.		No permissions required.
A124	VIBRATE_WHEN_RINGING	Whether the phone vibrates when it is ringing during an incoming call.		No permissions required.
A125	isSafeMode	Returns whether the device has been booted into safe mode.		No permissions required.
Package Manager		Package Manager is used to retrieve various kinds of information related to the application packages that are currently installed on the device.		No permissions required.
A126	getInstalledApplications	Returns a list of all application packages that are installed on the device.		No permissions required.
A127	getInstallerPackageName	Retrieves the package name of the application that installed a package. This identifies which market the package came from.		No permissions required.
A128	getSystemAvailableFeatures	Retrieves a list of features that are available on the device.		No permissions required.

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A129	getSystemSharedLibraryNames	Retrieves a list of shared libraries that are available on the device.		No permissions required.
Environment		Environment provides access to environment variables.		No permissions required.
A130	getExternalStorageState	Returns the current state of the primary shared/external storage media.		No permissions required.
Locale		Represents a specific geographical, political, or cultural region.		No permissions required.
A131	getAvailableLocales	Returns the system's installed locales.		No permissions required.
Timezone		Timezone represents a time zone, primarily used for configuring a Calendar or SimpleDateFormat instance.		No permissions required.
DisplayMetrics		DisplayMetrics describes general information about a display, such as its size, density, and font scaling.		No permissions required.
A132	density	The logical density of the display.		No permissions required.

<b>Group or Identifier</b>	<b>Element</b>	<b>Description</b>	<b>Comments</b>	<b>Permissions</b>
A133	densityDpi	The screen density expressed as dots-per-inch.		No permissions required.
A134	scaledDensity	A scaling factor for fonts displayed on the display.		No permissions required.
A135	xdpi	The exact physical pixels per inch of the screen in the X dimension.		No permissions required.
A136	ydpi	The exact physical pixels per inch of the screen in the Y dimension.		No permissions required.
StatFs		StatFs retrieves overall information about the space on a filesystem.		No permissions required.
A137	getTotalBytes	The total number of bytes supported by the filesystem.		No permissions required.

## 2.6 iOS-Specific Device Parameters

Table 2.4 provides information about the device parameters that shall be collected by the 3DS SDK from the iOS mobile platform for risk analysis by the ACS.

In this table, the Group or Identifier column contains the name of the parameter group or parameter identifier.

**Note:** The 3DS SDK does not require any permissions to collect these parameters.

**Note:** Each parameter listed in this table shall be collected by the 3DS SDK unless the parameter cannot be collected for any of the reasons stated in Table 2.6.

**Table 2.4: iOS-Specific Device Parameters**

<b>Group or Identifier</b>	<b>Attribute</b>	<b>Description</b>
UIDevice		UIDevice provides a singleton instance representing the current device.
I001	Identifier For Vendor	Alphanumeric string that uniquely identifies a device to the app's vendor.
I002	UserInterfaceIdiom	Style of interface to use on the current device.
UIFont		UIFont provides the interface for getting and setting font information.
I003	familyNames	Returns an array of font family names available on the system.
I004	fontNamesForFamilyName	Returns an array of font names available in a particular font family using the system font family.
I005	systemFont	System font
I006	labelFontSize	Returns the standard font size used for labels.
I007	buttonFontSize	Returns the standard font size used for buttons.
I008	smallSystemFontSize	Returns the size of the standard small system font.
I009	systemFontSize	Returns the size of the standard system font.
NSLocale		NSLocale encapsulates all of the conventions about language and culture for a particular locale.
I010	systemLocale	Returns the ID of the generic locale that contains fixed "backstop" settings that provide values for otherwise undefined keys.

Group or Identifier	Attribute	Description
I011	availableLocaleIdentifiers	Returns an array of <code>NSString</code> objects, each of which identifies a locale available on the system.
I012	preferredLanguages	Returns the user's language preference order as an array of strings.
NSTimeZone		<code>NSTimeZone</code> defines the behavior of time zone objects.
I013	defaultTimeZone	Returns the default time zone for the current application.

## 2.7 Windows Phone-Specific Device Parameters

Table 2.5 provides information about the device parameters that shall be collected by the 3DS SDK from the Windows Phone mobile platform for risk analysis by the ACS.

In this table, the Group or Identifier column contains the name of the parameter group or parameter identifier.

**Note:** The 3DS SDK does not require any permissions to collect these parameters.

**Note:** Each parameter listed in this table shall be collected by the 3DS SDK unless the parameter cannot be collected for any of the reasons stated in Table 2.6.

**Table 2.5: Windows Phone-Specific Device Parameters**

Group or Identifier	Attribute	Description
Globalization Preferences		<code>GlobalizationPreferences</code> is used to obtain the user's globalization preferences.
W001	Calendars	Gets the set of calendars that are preferred by the user, in the order of preference.
W002	Clocks	Gets the set of clocks that are preferred by the user, in the order of preference.
W003	Currencies	Gets the set of currencies that are preferred by the user, in the order of preference.

<b>Group or Identifier</b>	<b>Attribute</b>	<b>Description</b>
W004	HomeGeographicRegion	Gets the user's home geographic region.
W005	Languages	Gets the set of languages preferred by the user, in the order of preference.
W006	WeekStartsOn	Gets the day of the week that is considered to be the first day of the week.
External Storage Device		
W007	ExternalStorageID	Gets the ID value that uniquely identifies the SD card.
AnalyticsInfo		AnalyticsInfo provides information about the device for profiling purposes.
W008	DeviceForm	Gets the device form.
EasClientDeviceInformation		EasClientDeviceInformation provides apps the ability to retrieve device information from the local device.
W009	Id	Returns the identifier of the local device.
W010	SystemFirmwareVersion	Returns the system firmware version of the local device.
W011	SystemHardwareVersion	Returns the system hardware version of the local device.
W012	SystemManufacturer	Returns the system manufacturer of the local device.
W013	SystemProductName	Returns the system product name of the local device.
W014	SystemSku	Returns the system SKU of the local device.
DisplayInformation		DisplayInformation monitors and controls physical display information.

<b>Group or Identifier</b>	<b>Attribute</b>	<b>Description</b>
W015	AutoRotationPreferences	Gets and sets the preferred orientation of the app.
W016	CurrentOrientation	Gets the current orientation of a rectangular monitor.
W017	LogicalDpi	Gets the pixels per logical inch of the current environment.
W018	NativeOrientation	Gets the native orientation of the display monitor, which is typically the orientation where the buttons on the device match the orientation of the monitor.
W019	RawDpiX	Gets the raw dots per inch (DPI) along the X-axis of the display monitor.
W020	RawDpiY	Gets the raw dots per inch (DPI) along the Y-axis of the display monitor.
W021	RawPixelsPerViewPixel	Gets a value representing the number of raw (physical) pixels for each view (layout) pixel.
W022	ResolutionScale	Gets the scale factor of the immersive environment.
W023	StereoEnabled	Gets a value that indicates whether the device supports stereoscopic 3D.
Network Information		Network Information provides access to network connection information for the local machine.
W024	GetNetworkNames	Retrieves names associated with the network with which the connection is currently established.
HostInformation		HostInformation provides access to a string that uniquely identifies a device per publisher.

Group or Identifier	Attribute	Description
W025	PublisherHostId	A string that uniquely identifies a device. This string is unique per device and per publisher, which means that no two publishers will receive the same value for the same device.

## 2.8 Reasons for Device Parameters Unavailability

Table 2.6 provides a list of reason codes and descriptions to address the unavailability of a device parameter. In case a 3DS SDK is unable to collect a particular device parameter, then the reason for the same shall be sent in the device parameters JSON with the key as “DPNA”, as shown in the sample provided in Table 2.7.

**Table 2.6: Device Parameter Unavailability Reasons**

Reason Code	Description
RE01	Market or regional restriction on the parameter.
RE02	Platform version does not support the parameter or the parameter has been deprecated.
RE03	Parameter collection not possible without prompting the user for permission.

## 2.9 Device Information JSON Data

Table 2.7 provides a sample device parameters JSON. As shown in the sample JSON, the following keys are used in conjunction with the keys for the device identification parameters:

- DV: Data Version
- DD: Device Data
- DPNA: Device Parameter Not Available
- SW: Security Warning. For information about Security Warning, refer to the *EMV 3-D Secure SDK Specification*.

**Table 2.7: Device Parameters JSON Structure**

Platform	Device Information
Android	{ "DV": "1.0", "DD": { "C001": "Android", "C002": "HTC One_M8", "C004": "5.0.1", "C005": "en_US", "C006": "Eastern Standard Time", "C007": "06797903-fb61-41ed-94c2-4d2b74e27d18", "C009": "John's Android Device", . . . . . }, "DPNA": { "C010": "RE01", "C011": "RE03" }, "SW": [ "SW01", "SW04" ] }
iOS	{ "DV": "1.0", "DD": { "C001": "iOS", "C002": "iPhone 5c", "C003": " iPhone OS", "C004": "9.2", "C005": "en-US", "C006": "GMT-6", "C009": "John's iPhone", . . . . . }, "DPNA": { "C010": "RE01", "C011": "RE03" }, "SW": [ "SW01", "SW04" ] }
Windows Phone	{ "DV": "1.0", "DD": { "C001": "Windows", "C002": "NOKIA RM-984_1006", "C003": "WindowPhone", "C004": "10.0.10586.11", "C005": "en-US", "C006": "(UTC-06:00) Central Time (US & Canada)", "C007": "1bbd95da4520a6df7b94480d69f3cbb", "C008": "1280x720", "C009": "My Phone", . . . . . }, "DPNA": { "C010": "RE02", "C011": "RE03" }, "SW": [ "SW01", "SW04" ] }

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