Overview

The Non-Embedded Smart Agent for Licensing (NESAL) provides API to work with Cisco's software products. The goal is to make licensing a transparent/inherited/built-in feature in all Cisco software products.
 The Smart Agent will be made available as either a source component or a JAR package with a set of class library and resource files.

The API are divided into two packages: com.cisco.nesal.agent and com.cisco.nesal.plugin:

1. Package com.cisco.nesal.agent

The classes and interfaces in this package are divided into the following categories. They are available for software products to use.

Admin & Management API

- com.cisco.nesal.agent.SmartAgent
- com.cisco.nesal.agent.SmartAgentInfo
- com.cisco.nesal.agent.SmartAgentException
- com.cisco.nesal.agent.SmartAgentStatusCode
- com.cisco.nesal.agent.Certificate
- com.cisco.nesal.agent.UDI

Entitlement API

- com.cisco.nesal.agent.Entitlement
- com.cisco.nesal.agent.EntitlementEnforceMode
- com.cisco.nesal.agent.IEntitlementNotificationListener

Agent Notification API

- com.cisco.nesal.agent.ISmartAgentNotificationListener
- com.cisco.nesal.agent.SmartAgentNotification

2. Package com.cisco.nesal.plugin

The classes and interfaces in this package are divided into the following categories. The interfaces in this package are specification of the plugins that software products have to provide the implementation.

Communication API

- com.cisco.nesal.plugin.ICommunication
- com.cisco.nesal.plugin.DefaultCommunication

Platform Dependent API

- com.cisco.nesal.plugin.IPlatformDependent
- com.cisco.nesal.plugin.DefaultPlatformDependent

Platform Independent API

- com.cisco.nesal.plugin.IPlatformIndependent
- com.cisco.nesal.plugin.DefaultPlatformIndependent

Platform Independent Certificate & Crypto API

- com.cisco.nesal.plugin.ICrypto
- com.cisco.nesal.plugin.DefaultCrypto

Package
com.cisco.nesal.agent

This packages contains Java classes that provide service for software products to use. It includes the followings:

- Admin & Management API
- Entitlement API
- Agent Notification API

com.cisco.nesal.agent
Class Certificate

```
java.lang.Object
    │
    +-com.cisco.nesal.agent.Certificate
```

public class **Certificate**
extends java.lang.Object

Certificate class contains information of a certificate. The information is usually from the result of parsing a certificate.

Constructor Summary

public	[Certificate](#)()

Method Summary

java.sql.Date	[getExpiredDate](#)() Gets the expired date, with millisecond precision.
java.util.List	[getHaSudiList](#)() Gets the HA SUDI list.
java.sql.Date	[getIssuedDate](#)() Gets the issued date, with millisecond precision.
java.lang.String	[getSerialNumber](#)() Gets the serial number.
int	[getVersionNumber](#)() Gets the version number.

Methods inherited from class `java.lang.Object`

```
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait,
wait
```

Constructors

Certificate

public **Certificate**()

Methods

getSerialNumber

public java.lang.String **getSerialNumber**()

(continued on next page)

Gets the serial number.

Returns:
The serial number.

getHaSudiList

```
public java.util.List getHaSudiList()
```

Gets the HA SUDI list.

Returns:
The HA SUDI list.

getVersionNumber

```
public int getVersionNumber()
```

Gets the version number.

Returns:
The version number.

getIssuedDate

```
public java.sql.Date getIssuedDate()
```

Gets the issued date, with millisecond precision.

Returns:
The the issued date.

getExpiredDate

```
public java.sql.Date getExpiredDate()
```

Gets the expired date, with millisecond precision.

Returns:
The expired date.

com.cisco.nesal.agent
Class CSR

```
java.lang.Object
    │
    +-com.cisco.nesal.agent.CSR
```

public class **CSR**
extends java.lang.Object

This class represent a Certificate Signing Request (CSR).

Nested Class Summary

class	[CSR.CSRFormat](#) CSR.CSRFormat

Constructor Summary

public	[CSR](#)(java.security.PublicKey publicKey, java.lang.String rawCSR) The constructor.

Method Summary

java.security.PublicKey	[getPublicKey](#)() Gets the public key associated with this CSR.
java.lang.String	[getRawCSR](#)() Gets the CSR string.

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

CSR

```
public CSR(java.security.PublicKey publicKey,
           java.lang.String rawCSR)
```

The constructor.

Parameters:
publicKey - The public key.
rawCSR - The raw CSR string.

Methods

getPublicKey

```
public java.security.PublicKey getPublicKey()
```

Gets the public key associated with this CSR.

Returns:
The public key.

getRawCSR

```
public java.lang.String getRawCSR()
```

Gets the CSR string.

Returns:
The CSR string.

getPublicKey

```
public java.security.PublicKey getPublicKey()
```

com.cisco.nesal.agent
Class CSR.CSRFormat

```
java.lang.Object
    │
    +-java.lang.Enum
         │
         +-com.cisco.nesal.agent.CSR.CSRFormat
```

All Implemented Interfaces:
> java.io.Serializable**,** java.lang.Comparable

---

public static final class **CSR.CSRFormat**
extends java.lang.Enum

Output format type of Certificate Signing Request.

Field Summary

public static final	[B64](#) Certificate in B64 format.
public static final	[DER](#) Certificate in DER format.
public static final	[PEM](#) Certificate in PEM format.

Method Summary

static [CSR.CSRFormat](#)	[valueOf](#)(java.lang.String name)
static [CSR.CSRFormat[]](#)	[values](#)()

Methods inherited from class java.lang.Enum

clone, compareTo, equals, finalize, getDeclaringClass, hashCode, name, ordinal, toString, valueOf

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Methods inherited from interface java.lang.Comparable

compareTo

Fields

PEM

```
public static final com.cisco.nesal.agent.CSR.CSRFormat PEM
```

> Certificate in PEM format.

DER

```
public static final com.cisco.nesal.agent.CSR.CSRFormat DER
```

> Certificate in DER format.

B64

```
public static final com.cisco.nesal.agent.CSR.CSRFormat B64
```

> Certificate in B64 format.

Methods

values

```
public static CSR.CSRFormat[] values()
```

valueOf

```
public static CSR.CSRFormat valueOf(java.lang.String name)
```

com.cisco.nesal.agent
Class Entitlement

```
java.lang.Object
    |
    +-com.cisco.nesal.agent.Entitlement
```

public class **Entitlement**
extends java.lang.Object

The Entitlement class provides the interface for an application or feature in software product to request an entitlement (also called a license).

The term entitlement is used to distinguish this interface from previous node locked licensing solutions.

Nested Class Summary

class	**Entitlement.EntitlementEnforceMode** Entitlement.EntitlementEnforceMode

Constructor Summary

public	**Entitlement**(java.lang.String entitlementTag, java.lang.String entitlementVersion, IEntitlementNotificationListener notifyListener, java.lang.Object appData) Constructs an instance of Entitlement class.

Method Summary

SmartAgentStatusCode	**releaseEntitlement**() Releases the entitlement.
SmartAgentStatusCode	**requestEntitlement**(int count, Entitlement.EntitlementEnforceMode enforceMode) Requests an entitlement.

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Entitlement

```
public Entitlement(java.lang.String entitlementTag,
                   java.lang.String entitlementVersion,
                   IEntitlementNotificationListener notifyListener,
                   java.lang.Object appData)
```

Constructs an instance of Entitlement class.

Parameters:

entitlementTag - The entitlement tag for which to create an instance for.

`entitlementVersion` - The version of the entitlement tag.

`notifyListener` - The listener that will be invoked to when entitlement notifications arrives.

`appData` - This pointer will be passed to the listeners for the application to use. This is optional and can be null.

Methods

requestEntitlement

public SmartAgentStatusCode **requestEntitlement**(int count,
      Entitlement.EntitlementEnforceMode enforceMode)

Requests an entitlement. If the agent has already connected and registered with the Cisco Licensing Cloud then this method will return success and request the entitlement from the Licensing Cloud in the background. When the Licensing Cloud responds the agent will invoke the onNotify method of the listener object that was passed into the constructor if the enforcement mode changes from what was returned in the enforceMode parameter.

If the Agent has not already connected to the Licensing Cloud it will return success and the enforcement mode will be either SmartAgentEnforceModeEval or SmartAgentEnforceModeEvalExpired.

If the Agent later connects to the Licensing Cloud the it will send the list of all entitlements in use.

Parameters:

`count` - The total count to be consumed. Repeated calls to this method with the same Entitlement instance will simply reset the total count.

`enforceMode` - The enforcement mode to be used for this entitlement request. If and when the mode changes a SmartAgentEntitlementEnforceMode_t notification will be sent.

Returns:

The status of the operation.

releaseEntitlement

public SmartAgentStatusCode **releaseEntitlement**()

Releases the entitlement. Software product can release an entitlement if it is not needed any more to smart agent and then agent can contact Cisco backend for information updates etc.

Returns:

The status of the operation.

com.cisco.nesal.agent
Class Entitlement.EntitlementEnforceMode

```
java.lang.Object
    │
    +-java.lang.Enum
        │
        +-com.cisco.nesal.agent.Entitlement.EntitlementEnforceMode
```

All Implemented Interfaces:
>   java.io.Serializable, java.lang.Comparable

---

public static final class **Entitlement.EntitlementEnforceMode**
extends java.lang.Enum

The enforcement mode to be use for an entitlement.

Field Summary

public static final	SmartAgentEnforceModeDisabled
public static final	SmartAgentEnforceModeEval
public static final	SmartAgentEnforceModeEvalExpired
public static final	SmartAgentEnforceModeGracePeriod
public static final	SmartAgentEnforceModeGracePeriodExpired
public static final	SmartAgentEnforceModeInCompliance
public static final	SmartAgentEnforceModeInit
public static final	SmartAgentEnforceModeInvalid Error condition state.
public static final	SmartAgentEnforceModeInvalidTag
public static final	SmartAgentEnforceModeOutOfCompliance
public static final	SmartAgentEnforceModeOverage
public static final	SmartAgentEnforceModeWaiting

Method Summary

static Entitlement.Entitleme ntEnforceMode	valueOf(java.lang.String name)

---

static Entitlement.Entitleme ntEnforceMode[]	values()

Methods inherited from class `java.lang.Enum`

```
clone, compareTo, equals, finalize, getDeclaringClass, hashCode, name, ordinal,
toString, valueOf
```

Methods inherited from class `java.lang.Object`

```
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait,
wait
```

Methods inherited from interface `java.lang.Comparable`

```
compareTo
```

Fields

SmartAgentEnforceModeInvalid

```
public static final com.cisco.nesal.agent.Entitlement.EntitlementEnforceMode
SmartAgentEnforceModeInvalid
```

Error condition state.

SmartAgentEnforceModeInit

```
public static final com.cisco.nesal.agent.Entitlement.EntitlementEnforceMode
SmartAgentEnforceModeInit
```

SmartAgentEnforceModeWaiting

```
public static final com.cisco.nesal.agent.Entitlement.EntitlementEnforceMode
SmartAgentEnforceModeWaiting
```

SmartAgentEnforceModeInCompliance

```
public static final com.cisco.nesal.agent.Entitlement.EntitlementEnforceMode
SmartAgentEnforceModeInCompliance
```

SmartAgentEnforceModeOutOfCompliance

```
public static final com.cisco.nesal.agent.Entitlement.EntitlementEnforceMode
SmartAgentEnforceModeOutOfCompliance
```

SmartAgentEnforceModeOverage

public static final com.cisco.nesal.agent.Entitlement.EntitlementEnforceMode
SmartAgentEnforceModeOverage

SmartAgentEnforceModeEval

public static final com.cisco.nesal.agent.Entitlement.EntitlementEnforceMode
SmartAgentEnforceModeEval

SmartAgentEnforceModeEvalExpired

public static final com.cisco.nesal.agent.Entitlement.EntitlementEnforceMode
SmartAgentEnforceModeEvalExpired

SmartAgentEnforceModeGracePeriod

public static final com.cisco.nesal.agent.Entitlement.EntitlementEnforceMode
SmartAgentEnforceModeGracePeriod

SmartAgentEnforceModeGracePeriodExpired

public static final com.cisco.nesal.agent.Entitlement.EntitlementEnforceMode
SmartAgentEnforceModeGracePeriodExpired

SmartAgentEnforceModeDisabled

public static final com.cisco.nesal.agent.Entitlement.EntitlementEnforceMode
SmartAgentEnforceModeDisabled

SmartAgentEnforceModeInvalidTag

public static final com.cisco.nesal.agent.Entitlement.EntitlementEnforceMode
SmartAgentEnforceModeInvalidTag

Methods

values

public static Entitlement.EntitlementEnforceMode[] **values**()

valueOf

public static <u>Entitlement.EntitlementEnforceMode</u> **valueOf**(java.lang.String name)

valueOf

public static <u>Entitlement.EntitlementEnforceMode</u> **valueOf**(java.lang.String name)

com.cisco.nesal.agent
Interface IEntitlementNotificationListener

public interface **IEntitlementNotificationListener**
extends

This interface represents a listener for receiving EntitlementNotification. The class that is interested in processing EntitlementNotification should implement this interface.

Method Summary

void	onNotify(SmartAgentNotification notification) Invoked when EntitlementNotification arrives.

Methods

onNotify

public void **onNotify**(SmartAgentNotification notification)

Invoked when EntitlementNotification arrives.

Parameters:
notification - The notification for the entitlement.

com.cisco.nesal.agent
Interface IMeteredUsageListener

public interface **IMeteredUsageListener**
extends

This interface represents a listener for receiving MeteredUsageNotification. The class that is interested in processing MeteredUsageNotification should implement this interface.

Notes: This interface is place holder only and not yet supported by Smart Licensing.

com.cisco.nesal.agent
Interface ISmartAgentNotificationListener

public interface **ISmartAgentNotificationListener**
extends

This is the interface for receiving Smart Agent notification. The application should implement the onNotify method and add it with SmartAgent's addNotificationListener method. The agent will call this method when any global notification occurs.

Method Summary

void	onNotify(SmartAgentNotification notification) The application should implement the onNotification method to receive notification.

Methods

onNotify

public void **onNotify**(SmartAgentNotification notification)

 The application should implement the onNotification method to receive notification.

Parameters:
 notification - The notification object.

com.cisco.nesal.agent
Class SmartAgent

```
java.lang.Object
    |
    +-com.cisco.nesal.agent.SmartAgent
```

public class **SmartAgent**
extends java.lang.Object

This class represents the Admin and Management services provided by Smart Agent.

Constructor Summary

public	**SmartAgent**(ICommunication commImpl, IPlatformIndependent piImpl, IPlatformDependent pdImpl, ICrypto cryptoImpl, ISmartAgentNotificationListener listener) Constructs an instance of SmartAgent class.

Method Summary

void	**addNotificationListener**(ISmartAgentNotificationListener listener) Registers the listener for global event.
SmartAgentStatusCode	**deregister**() De-register this product instance with the Cisco Licensing Cloud.
SmartAgentStatusCode	**disable**() Disable Smart Licensing on the product instance.
SmartAgentStatusCode	**enable**() Enable Smart Licensing on the product instance and turn off any other licensing technology on the product if any.
SmartAgentInfo	**getSmartAgentInfo**() Gets the structured information associated with the agent.
boolean	**isEnabled**() Check whether the Samrt Agent is enabled.
SmartAgentStatusCode	**register**(java.lang.String token, boolean force) Register this product instance with Cisco Licensing Cloud using the given token.
SmartAgentStatusCode	**renewAuth**() Renews the authorization by sending renew message to the Cisco Licensing Cloud.
SmartAgentStatusCode	**renewIdCert**() Renews the ID certificate by sending renew message to the Cisco Licensing Cloud.
SmartAgentStatusCode	**shutdown**() Shuts down the Smart Agent.

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SmartAgent

```
public SmartAgent(ICommunication commImpl,
                  IPlatformIndependent piImpl,
                  IPlatformDependent pdImpl,
                  ICrypto cryptoImpl,
                  ISmartAgentNotificationListener listener)
```

Constructs an instance of SmartAgent class. Product that wants to use Smart Agent services needs to supplied the implementation of the required interface as parameters to this SmartAgent constructor.

Parameters:

commImpl - The implementation of ICommunication interface provided by the plugin.

piImpl - The implementation of IPlatformIndependent interface provided by the plugin.

pdImpl - The implementation of IPlatformDependent interface provided by the plugin.

cryptoImpl - The implementation of ICrypto interface provided by the plugin.

listener - The listener that will receive global notification. This is optional and can be set yo null.

Methods

shutdown

```
public SmartAgentStatusCode shutdown()
```

Shuts down the Smart Agent.

During Smart Agent shutdown, it will:

1. Release allocated resources
2. Reject all the subsequence requests

Returns:

The status of the operation.

enable

```
public SmartAgentStatusCode enable()
```

Enable Smart Licensing on the product instance and turn off any other licensing technology on the product if any.

Returns:

The status of the operation.

isEnabled

```
public boolean isEnabled()
```

Check whether the Samrt Agent is enabled.

Returns:

True if Smart Agent is enabled; false otherwise.

disable

public [SmartAgentStatusCode](#) **disable**()

Disable Smart Licensing on the product instance. During disable, smart agent will remove certificate, inform Cisco Licensing Cloud. If the agent is registered this will also cause a deregister.

Returns:
The status of the operation.

register

public [SmartAgentStatusCode](#) **register**(java.lang.String token,
        boolean force)

Register this product instance with Cisco Licensing Cloud using the given token. Upon successful registration the agent will send the current entitlement usage information to Cisco. Every 30 days the agent will automatically renew the registration. The token are sent to Cisco in the registration message but are not saved on the storage.

Parameters:
token - The token obtained from the Cisco Smart Licensing portal.
force - If true, force the registration even if it has been registered.

Returns:
The status of the operation.

deregister

public [SmartAgentStatusCode](#) **deregister**()

De-register this product instance with the Cisco Licensing Cloud. Upon successful de-registration, the agent will send the current entitlement usage information to Cisco.

Returns:
The status of the operation.

renewIdCert

public [SmartAgentStatusCode](#) **renewIdCert**()

Renews the ID certificate by sending renew message to the Cisco Licensing Cloud.

Normally the renew operation is automatic and occurs as specified in the previous register or renew response message. There may be times that application needs to trigger a renew operation.

Returns:
The status of the operation.

renewAuth

public [SmartAgentStatusCode](#) **renewAuth**()

Renews the authorization by sending renew message to the Cisco Licensing Cloud.

Normally the authorization renew operation is automatic and occurs as specified in the previous AUTH response message (usually 30 days). There may be times that application needs to trigger a renew operation.

Returns:
The status of the operation.

addNotificationListener

public void **addNotificationListener**(ISmartAgentNotificationListener listener)

Registers the listener for global event.

The onNotify() method in the listener will be called when there is global event triggered.

Parameters:
listener - The listener (callback) that will receive the notification.

getSmartAgentInfo

public SmartAgentInfo **getSmartAgentInfo**()

Gets the structured information associated with the agent.

Returns:
The SmartAgentInfo object.

com.cisco.nesal.agent
Class SmartAgentException

```
java.lang.Object
    │
    +-java.lang.Throwable
        │
        +-java.lang.Exception
            │
            +-com.cisco.nesal.agent.SmartAgentException
```

All Implemented Interfaces:
     java.io.Serializable

---

public class **SmartAgentException**
extends java.lang.Exception

Exception to be thrown when error occurred in License Agent operations.

Constructor Summary

public	SmartAgentException(SmartAgentStatusCode statuCode) Constructor of the exception.

Method Summary

SmartAgentStatusCode	getStatuCode() Gets the status code of the exception.

Methods inherited from class `java.lang.Throwable`

addSuppressed, fillInStackTrace, getCause, getLocalizedMessage, getMessage,
getStackTrace, getSuppressed, initCause, printStackTrace, printStackTrace,
printStackTrace, setStackTrace, toString

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait,
wait

Constructors

SmartAgentException

public **SmartAgentException**(SmartAgentStatusCode statuCode)

Constructor of the exception.

Parameters:
    statuCode

Methods

---

getStatuCode

public [SmartAgentStatusCode](#) **getStatuCode**()

Gets the status code of the exception.

Returns:
the statuCode

getStatuCode

public [SmartAgentStatusCode](#) **getStatuCode**()

com.cisco.nesal.agent
Class SmartAgentInfo

```
java.lang.Object
    │
    +-com.cisco.nesal.agent.SmartAgentInfo
```

public class **SmartAgentInfo**
extends java.lang.Object

This class represents the structured information of the Smart Agent.

Nested Class Summary

class	[SmartAgentInfo.CertificateInfo](#) SmartAgentInfo.CertificateInfo
class	[SmartAgentInfo.EnableInfo](#) SmartAgentInfo.EnableInfo
class	[SmartAgentInfo.EntitlementInfo](#) SmartAgentInfo.EntitlementInfo
class	[SmartAgentInfo.OtherInfo](#) SmartAgentInfo.OtherInfo
class	[SmartAgentInfo.ScheduledJobInfo](#) SmartAgentInfo.ScheduledJobInfo
class	[SmartAgentInfo.StatusInfo](#) SmartAgentInfo.StatusInfo
class	[SmartAgentInfo.VersionInfo](#) SmartAgentInfo.VersionInfo

Constructor Summary

public	[SmartAgentInfo](#)()

Method Summary

[SmartAgentInfo.CertificateInfo](#)	[getCertificateInfo](#)() Gets the certificate information.
java.util.List	[getEntitlementInfoList](#)() Gets the entitlement information list.
[SmartAgentInfo.OtherInfo](#)	[getOtherInfo](#)() Gets the other information.
java.util.List	[getScheduledJobInfoList](#)() Gets the scheduled job information list.

SmartAgentInfo.Status Info	getStatusInfo() Gets the status information.	
UDI	getUdiInfo() Gets the UDI information.	
SmartAgentInfo.Versio nInfo	getVersionInfo() Gets the version information.	

Methods inherited from class `java.lang.Object`

```
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait,
wait
```

Constructors

SmartAgentInfo

public **SmartAgentInfo**()

Methods

getEntitlementInfoList

public java.util.List **getEntitlementInfoList**()

Gets the entitlement information list.

Returns:
The entitlement information list.

getUdiInfo

public UDI **getUdiInfo**()

Gets the UDI information.

Returns:
The UDI information.

getVersionInfo

public SmartAgentInfo.VersionInfo **getVersionInfo**()

Gets the version information.

Returns:
The version information.

getCertificateInfo

public SmartAgentInfo.CertificateInfo **getCertificateInfo**()

Gets the certificate information.

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Returns:
> The certificate information.

getStatusInfo

public [SmartAgentInfo.StatusInfo](#) **getStatusInfo**()

Gets the status information.

Returns:
> The status information.

getScheduledJobInfoList

public java.util.List **getScheduledJobInfoList**()

Gets the scheduled job information list.

Returns:
> The scheduled job information list.

getOtherInfo

public [SmartAgentInfo.OtherInfo](#) **getOtherInfo**()

Gets the other information.

Returns:
> The other information.

com.cisco.nesal.agent
Class SmartAgentInfo.EntitlementInfo

```
java.lang.Object
   │
   +-com.cisco.nesal.agent.SmartAgentInfo.EntitlementInfo
```

public static class **SmartAgentInfo.EntitlementInfo**
extends java.lang.Object

This inner class of SmartAgentInfo contains entitlement information in a data structure.

Constructor Summary

public	SmartAgentInfo.EntitlementInfo()

Method Summary

Entitlement.EntitlementEnforceMode	getEnforceMode() Gets the enforce mode.
java.lang.String	getEntitlementTag() Gets the entitlement tag.
java.lang.String	getEntitlementVersion() Gets the entitlement version.
int	getRequestedCount() Gets the requested count.
long	getRequestedDate() Gets the requested date, with millisecond precision.
java.lang.String	getVendorString() Gets the vendor string.

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SmartAgentInfo.EntitlementInfo

public **SmartAgentInfo.EntitlementInfo**()

Methods

getEntitlementTag

`public java.lang.String `**`getEntitlementTag`**`()`

Gets the entitlement tag.

Returns:
The entitlement tag.

getEntitlementVersion

`public java.lang.String `**`getEntitlementVersion`**`()`

Gets the entitlement version.

Returns:
The entitlement version.

getEnforceMode

`public `[`Entitlement.EntitlementEnforceMode`](#)` `**`getEnforceMode`**`()`

Gets the enforce mode.

Returns:
The enforce mode.

getRequestedDate

`public long `**`getRequestedDate`**`()`

Gets the requested date, with millisecond precision.

Returns:
The requested date.

getRequestedCount

`public int `**`getRequestedCount`**`()`

Gets the requested count.

Returns:
The requested count.

getVendorString

`public java.lang.String `**`getVendorString`**`()`

Gets the vendor string.

Returns:
The vendor string.

com.cisco.nesal.agent
Class SmartAgentInfo.VersionInfo

```
java.lang.Object
   |
   +-com.cisco.nesal.agent.SmartAgentInfo.VersionInfo
```

public static class **SmartAgentInfo.VersionInfo**
extends java.lang.Object

This inner class of SmartAgentInfo contains version information in a data structure.

TODO - simply this since it contains only one attribute?

Constructor Summary

public	[SmartAgentInfo.VersionInfo](#)()

Method Summary

java.lang.String	[getVersion](#)() Gets the version.

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SmartAgentInfo.VersionInfo

public **SmartAgentInfo.VersionInfo**()

Methods

getVersion

public java.lang.String **getVersion**()

> Gets the version.
>
> **Returns:**
> > The version.

com.cisco.nesal.agent
Class SmartAgentInfo.CertificateInfo

```
java.lang.Object
    |
    +-com.cisco.nesal.agent.SmartAgentInfo.CertificateInfo
```

public static class **SmartAgentInfo.CertificateInfo**
extends java.lang.Object

This inner class of SmartAgentInfo contains certificate information in a data structure.

Constructor Summary

public	SmartAgentInfo.CertificateInfo()

Method Summary

Certificate	getIdCert() Gets the ID Certificate.
Certificate	getSigningCert() Gets the Signing Certificate.

Methods inherited from class `java.lang.Object`

```
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait,
wait
```

Constructors

SmartAgentInfo.CertificateInfo

public **SmartAgentInfo.CertificateInfo**()

Methods

getIdCert

public Certificate **getIdCert**()

    Gets the ID Certificate.

    Returns:
        The ID Certificate.

getSigningCert

public Certificate **getSigningCert**()

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Gets the Signing Certificate.

Returns:

The Signing Certificate.

com.cisco.nesal.agent
Class SmartAgentInfo.ScheduledJobInfo

```
java.lang.Object
   │
   +-com.cisco.nesal.agent.SmartAgentInfo.ScheduledJobInfo
```

public static class **SmartAgentInfo.ScheduledJobInfo**
extends java.lang.Object

This inner class of SmartAgentInfo contains scheduled job information in a data structure.

Constructor Summary

public	SmartAgentInfo.ScheduledJobInfo()

Method Summary

java.lang.String	getJobName() Gets the job name.
long	getNextOccurrenceDate() Gets the next occurrence date, with millisecond precision.
boolean	isCanceledFlag() Gets the canceled flag.
boolean	isRecurringFlag() Gets the recurring flag.

Methods inherited from class java.lang.Object

```
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait,
wait
```

Constructors

SmartAgentInfo.ScheduledJobInfo

public **SmartAgentInfo.ScheduledJobInfo**()

Methods

getJobName

public java.lang.String **getJobName**()

Gets the job name.

Returns:

The job name.

isRecurringFlag

```
public boolean isRecurringFlag()
```

Gets the recurring flag.

Returns:
The recurring flag.

isCanceledFlag

```
public boolean isCanceledFlag()
```

Gets the canceled flag.

Returns:
The canceled flag.

getNextOccurrenceDate

```
public long getNextOccurrenceDate()
```

Gets the next occurrence date, with millisecond precision.

Returns:
The next occurrence date.

com.cisco.nesal.agent
Class SmartAgentInfo.EnableInfo

```
java.lang.Object
    │
    +-com.cisco.nesal.agent.SmartAgentInfo.EnableInfo
```

public static class **SmartAgentInfo.EnableInfo**
extends java.lang.Object

This inner class of SmartAgentInfo contains "enable: information in a data structure.

TODO - simply this since it contains only one attribute?

Constructor Summary

public	[SmartAgentInfo.EnableInfo](#)()

Method Summary

boolean	[isEnableFlag](#)() Gets the enable flag.

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SmartAgentInfo.EnableInfo

public **SmartAgentInfo.EnableInfo**()

Methods

isEnableFlag

public boolean **isEnableFlag**()

Gets the enable flag.

Returns:
The enable flag.

com.cisco.nesal.agent
Class SmartAgentInfo.OtherInfo

```
java.lang.Object
   │
   +-com.cisco.nesal.agent.SmartAgentInfo.OtherInfo
```

public static class **SmartAgentInfo.OtherInfo**
extends java.lang.Object

This inner class of SmartAgentInfo contains all other related information in a data structure.

TODO - The naming of the class is dubious. Any better suggestion?

Nested Class Summary

class	[SmartAgentInfo.OtherInfo.TransportMode](#)
	SmartAgentInfo.OtherInfo.TransportMode

Constructor Summary

public	[SmartAgentInfo.OtherInfo](#)()

Method Summary

java.lang.String	[getComponentVersion](#)() Gets the component version.
int	[getCurrentStateId](#)() Gets the current state ID.
java.lang.String	[getHttpURL](#)() Gets the HTTP URL.
[SmartAgentInfo.OtherInfo.TransportMode](#)	[getTransportMode](#)() Gets the transport mode.

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SmartAgentInfo.OtherInfo

public **SmartAgentInfo.OtherInfo**()

Methods

getComponentVersion

public java.lang.String **getComponentVersion**()

Gets the component version.

Returns:
The component version.

getCurrentStateId

public int **getCurrentStateId**()

Gets the current state ID.

Returns:
The current state ID.

getTransportMode

public [SmartAgentInfo.OtherInfo.TransportMode](#) **getTransportMode**()

Gets the transport mode.

Returns:
The transport mode.

getHttpURL

public java.lang.String **getHttpURL**()

Gets the HTTP URL.

Returns:
The HTTP URL.

public java.lang.String **getComponentVersion**()

com.cisco.nesal.agent
Class SmartAgentInfo.OtherInfo.TransportMode

```
java.lang.Object
    │
    +-java.lang.Enum
        │
        +-com.cisco.nesal.agent.SmartAgentInfo.OtherInfo.TransportMode
```

All Implemented Interfaces:
> java.io.Serializable, java.lang.Comparable

---

public static final class **SmartAgentInfo.OtherInfo.TransportMode**
extends java.lang.Enum

The transport to use when sending and receiving messages for.

Field Summary

public static final	**SmartAgentTestTransportCallHome** Use the proper Call Home send routine.
public static final	**SmartAgentTestTransportHTTP** Use the direct HTTP to the cloud receiver.
public static final	**SmartAgentTestTransportInvalid** Invalid type, this is an error
public static final	**SmartAgentTestTransportLoopBack** Send the messages to the unit test which will reply with a dummy response.

Method Summary

static SmartAgentInfo.OtherInfo.TransportMode	**valueOf**(java.lang.String name)
static SmartAgentInfo.OtherInfo.TransportMode[]	**values**()

Methods inherited from class `java.lang.Enum`
clone, compareTo, equals, finalize, getDeclaringClass, hashCode, name, ordinal, toString, valueOf

Methods inherited from class `java.lang.Object`
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Methods inherited from interface `java.lang.Comparable`
compareTo

Fields

SmartAgentTestTransportInvalid

public static final com.cisco.nesal.agent.SmartAgentInfo.OtherInfo.TransportMode
SmartAgentTestTransportInvalid

Invalid type, this is an error

SmartAgentTestTransportLoopBack

public static final com.cisco.nesal.agent.SmartAgentInfo.OtherInfo.TransportMode
SmartAgentTestTransportLoopBack

Send the messages to the unit test which will reply with a dummy response.

SmartAgentTestTransportCallHome

public static final com.cisco.nesal.agent.SmartAgentInfo.OtherInfo.TransportMode
SmartAgentTestTransportCallHome

Use the proper Call Home send routine.

SmartAgentTestTransportHTTP

public static final com.cisco.nesal.agent.SmartAgentInfo.OtherInfo.TransportMode
SmartAgentTestTransportHTTP

Use the direct HTTP to the cloud receiver.

Methods

values

public static SmartAgentInfo.OtherInfo.TransportMode[] **values**()

valueOf

public static SmartAgentInfo.OtherInfo.TransportMode **valueOf**(java.lang.String name)

com.cisco.nesal.agent
Class SmartAgentInfo.StatusInfo

```
java.lang.Object
    │
    +-com.cisco.nesal.agent.SmartAgentInfo.StatusInfo
```

public static class **SmartAgentInfo.StatusInfo**
extends java.lang.Object

This inner class of SmartAgentInfo contains status information in a data structure.

Constructor Summary

public	[SmartAgentInfo.StatusInfo](#)()

Method Summary

long	[getDaysLeft](#)() Gets the days left.
[Entitlement.EntitlementEnforceMode](#)	[getStatus](#)() Gets the status.
java.lang.String	[getStatusName](#)() Gets the status name.

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SmartAgentInfo.StatusInfo

public **SmartAgentInfo.StatusInfo**()

Methods

getStatus

public [Entitlement.EntitlementEnforceMode](#) **getStatus**()

Gets the status.

Returns:
    The status.

getStatusName

```
public java.lang.String getStatusName()
```

>Gets the status name.

>**Returns:**
>>The status name.

getDaysLeft

```
public long getDaysLeft()
```

>Gets the days left.

>**Returns:**
>>The days left.

getStatusName

```
public java.lang.String getStatusName()
```

com.cisco.nesal.agent
Class SmartAgentNotification

```
java.lang.Object
    │
    +-com.cisco.nesal.agent.SmartAgentNotification
```

public class **SmartAgentNotification**
extends java.lang.Object

This class represents a notification from Smart Agent.

Nested Class Summary

class	[SmartAgentNotification.NotificationType](#) SmartAgentNotification.NotificationType

Constructor Summary

public	[SmartAgentNotification](#)()

Method Summary

[SmartAgentNotification.NotificationType](#)	[getNotificationType](#)() Get the type of notification.

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SmartAgentNotification

public **SmartAgentNotification**()

Methods

getNotificationType

public [SmartAgentNotification.NotificationType](#) **getNotificationType**()

Get the type of notification.

Returns:
Type of notification.

com.cisco.nesal.agent
Class SmartAgentNotification.NotificationType

```
java.lang.Object
    │
    +-java.lang.Enum
        │
        +-com.cisco.nesal.agent.SmartAgentNotification.NotificationType
```

All Implemented Interfaces:
    java.io.Serializable, java.lang.Comparable

---

public static final class **SmartAgentNotification.NotificationType**
extends java.lang.Enum

Notification types used for both entitlement notifications and global notifications.

Field Summary

public static final	[CommRestored](#)
public static final	[NotifyAuthRenewFailure](#)
public static final	[NotifyAuthRenewSuccess](#)
public static final	[NotifyCommFailure](#)
public static final	[NotifyDisabled](#)
public static final	[NotifyEnabled](#)
public static final	[NotifyEnforcementMode](#)
public static final	[NotifyHAChassisRole](#)
public static final	[NotifyHARole](#)
public static final	[NotifyIdCertExpired](#)
public static final	[NotifyIdCertNotStarted](#)
public static final	[NotifyIdCertRenewFail](#)
public static final	[NotifyIdCertRenewSuccess](#)
public static final	[NotifyInvalid](#)
public static final	[NotifyReady](#)

---

public static final	NotifyRegisterFailed
public static final	NotifyRegisterSuccess

Method Summary

static SmartAgentNotification.NotificationType	valueOf(java.lang.String name)
static SmartAgentNotification.NotificationType[]	values()

Methods inherited from class `java.lang.Enum`

clone, compareTo, equals, finalize, getDeclaringClass, hashCode, name, ordinal, toString, valueOf

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Methods inherited from interface `java.lang.Comparable`

compareTo

Fields

NotifyInvalid

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyInvalid

NotifyReady

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyReady

NotifyEnabled

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyEnabled

NotifyDisabled

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyDisabled

NotifyRegisterFailed

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyRegisterFailed

NotifyEnforcementMode

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyEnforcementMode

NotifyRegisterSuccess

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyRegisterSuccess

NotifyIdCertExpired

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyIdCertExpired

NotifyIdCertRenewSuccess

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyIdCertRenewSuccess

NotifyIdCertRenewFail

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyIdCertRenewFail

NotifyAuthRenewSuccess

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyAuthRenewSuccess

NotifyAuthRenewFailure

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyAuthRenewFailure

NotifyCommFailure

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyCommFailure

CommRestored

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
CommRestored

NotifyIdCertNotStarted

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyIdCertNotStarted

NotifyHARole

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyHARole

NotifyHAChassisRole

public static final com.cisco.nesal.agent.SmartAgentNotification.NotificationType
NotifyHAChassisRole

Methods

values

public static SmartAgentNotification.NotificationType[] **values**()

valueOf

public static SmartAgentNotification.NotificationType **valueOf**(java.lang.String name)

com.cisco.nesal.agent
Class SmartAgentStatusCode

```
java.lang.Object
    |
    +-java.lang.Enum
        |
        +-com.cisco.nesal.agent.SmartAgentStatusCode
```

All Implemented Interfaces:
        java.io.Serializable, java.lang.Comparable

---

public final class **SmartAgentStatusCode**
extends java.lang.Enum

This enum represents the status code that may be returned or contained in the exception after a call to the services provided Smart Agent.

Field Summary

public static final	SmartAgentCertExpired
public static final	SmartAgentCertInvalid
public static final	SmartAgentCryptoRootCAImportFailed
public static final	SmartAgentCSRGenerationError
public static final	SmartAgentErrorAlreadyEnabled
public static final	SmartAgentErrorAlreadyInit
public static final	SmartAgentErrorAlreadyRegistered
public static final	SmartAgentErrorBadHandle
public static final	SmartAgentErrorBadInputParams
public static final	SmartAgentErrorCommDisabled
public static final	SmartAgentErrorCommResponse
public static final	SmartAgentErrorCommSend
public static final	SmartAgentErrorCommUnkown
public static final	SmartAgentErrorFailToSetState
public static final	SmartAgentErrorInit

public static final	SmartAgentErrorInvalidRequest
public static final	SmartAgentErrorInvalidResponse
public static final	SmartAgentErrorMalloc
public static final	SmartAgentErrorMatchIdentifier
public static final	SmartAgentErrorMatchNonce
public static final	SmartAgentErrorMatchVendor
public static final	SmartAgentErrorMsgBuild
public static final	SmartAgentErrorMsgParse
public static final	SmartAgentErrorNotEnabled
public static final	SmartAgentErrorNotFound
public static final	SmartAgentErrorNotInit
public static final	SmartAgentErrorNotRegistered
public static final	SmartAgentErrorNotSupported
public static final	SmartAgentErrorNullCcoIdToken
public static final	SmartAgentErrorNullPointer
public static final	SmartAgentErrorPINotInit
public static final	SmartAgentErrorSMFailToCreate
public static final	SmartAgentErrorSMFailToDestroy
public static final	SmartAgentErrorSMFailToInit
public static final	SmartAgentErrorSMFailToRun
public static final	SmartAgentErrorSMPostNotAllow
public static final	SmartAgentErrorStorageFailToRetrieve
public static final	SmartAgentErrorStorageFailToStore
public static final	SmartAgentErrorUnsupportedResponse

public static final	SmartAgentGenerateSignatureFailed
public static final	SmartAgentNodeCertVerificationFailed
public static final	SmartAgentParseCertificateFailed
public static final	SmartAgentReqMsgMissingMandatoryField
public static final	SmartAgentResponseError
public static final	SmartAgentSignCertVerificationFailed
public static final	SmartAgentSuccess
public static final	SmartAgentVerifySignatureFailed

Method Summary

int	getValue() Get the value associated with the enum instance.
static SmartAgentStatusCode	valueOf(java.lang.String name)
static SmartAgentStatusCode[]	values()

Methods inherited from class `java.lang.Enum`

clone, compareTo, equals, finalize, getDeclaringClass, hashCode, name, ordinal, toString, valueOf

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Methods inherited from interface `java.lang.Comparable`

compareTo

Fields

SmartAgentSuccess

public static final com.cisco.nesal.agent.SmartAgentStatusCode **SmartAgentSuccess**

SmartAgentErrorMalloc

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode SmartAgentErrorMalloc
```

SmartAgentErrorNullPointer

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorNullPointer
```

SmartAgentErrorBadInputParams

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorBadInputParams
```

SmartAgentErrorBadHandle

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorBadHandle
```

SmartAgentErrorNotFound

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode SmartAgentErrorNotFound
```

SmartAgentErrorNotSupported

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorNotSupported
```

SmartAgentErrorAlreadyInit

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorAlreadyInit
```

SmartAgentErrorNotInit

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode SmartAgentErrorNotInit
```

SmartAgentErrorSMFailToCreate

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorSMFailToCreate
```

SmartAgentErrorSMFailToRun

public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorSMFailToRun

SmartAgentErrorSMFailToInit

public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorSMFailToInit

SmartAgentErrorSMFailToDestroy

public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorSMFailToDestroy

SmartAgentErrorMsgParse

public static final com.cisco.nesal.agent.SmartAgentStatusCode **SmartAgentErrorMsgParse**

SmartAgentErrorMsgBuild

public static final com.cisco.nesal.agent.SmartAgentStatusCode **SmartAgentErrorMsgBuild**

SmartAgentErrorNotEnabled

public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorNotEnabled

SmartAgentErrorInvalidRequest

public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorInvalidRequest

SmartAgentErrorInit

public static final com.cisco.nesal.agent.SmartAgentStatusCode **SmartAgentErrorInit**

SmartAgentErrorFailToSetState

public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorFailToSetState

SmartAgentErrorUnsupportedResponse

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorUnsupportedResponse
```

SmartAgentErrorInvalidResponse

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorInvalidResponse
```

SmartAgentErrorStorageFailToStore

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorStorageFailToStore
```

SmartAgentErrorStorageFailToRetrieve

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorStorageFailToRetrieve
```

SmartAgentErrorNullCcoIdToken

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorNullCcoIdToken
```

SmartAgentErrorMatchIdentifier

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorMatchIdentifier
```

SmartAgentErrorMatchVendor

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorMatchVendor
```

SmartAgentErrorMatchNonce

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorMatchNonce
```

SmartAgentErrorCommDisabled

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorCommDisabled
```

SmartAgentErrorCommSend

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode SmartAgentErrorCommSend
```

SmartAgentErrorCommResponse

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorCommResponse
```

SmartAgentErrorCommUnkown

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorCommUnkown
```

SmartAgentErrorSMPostNotAllow

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorSMPostNotAllow
```

SmartAgentReqMsgMissingMandatoryField

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentReqMsgMissingMandatoryField
```

SmartAgentResponseError

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode SmartAgentResponseError
```

SmartAgentErrorPINotInit

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorPINotInit
```

SmartAgentErrorAlreadyEnabled

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorAlreadyEnabled
```

(continued from last page)

SmartAgentErrorAlreadyRegistered

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorAlreadyRegistered
```

SmartAgentCertInvalid

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode SmartAgentCertInvalid
```

SmartAgentCertExpired

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode SmartAgentCertExpired
```

SmartAgentErrorNotRegistered

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentErrorNotRegistered
```

SmartAgentCSRGenerationError

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentCSRGenerationError
```

SmartAgentVerifySignatureFailed

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentVerifySignatureFailed
```

SmartAgentGenerateSignatureFailed

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentGenerateSignatureFailed
```

SmartAgentSignCertVerificationFailed

```
public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentSignCertVerificationFailed
```

SmartAgentNodeCertVerificationFailed

public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentNodeCertVerificationFailed

SmartAgentParseCertificateFailed

public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentParseCertificateFailed

SmartAgentCryptoRootCAImportFailed

public static final com.cisco.nesal.agent.SmartAgentStatusCode
SmartAgentCryptoRootCAImportFailed

Methods

values

public static [SmartAgentStatusCode[]](#) **values**()

valueOf

public static [SmartAgentStatusCode](#) **valueOf**(java.lang.String name)

getValue

public int **getValue**()

Get the value associated with the enum instance.

Returns:
Integer value of the enum instance.

com.cisco.nesal.agent
Class SUDI

```
java.lang.Object
    │
    +-com.cisco.nesal.agent.SUDI
```

public class **SUDI**
extends java.lang.Object

This class represents Secured Unique Device Identifier (SUDI).

Constructor Summary

public	SUDI(java.lang.String pid, java.lang.String serialNumber, java.lang.String vid, java.lang.String suvi, java.lang.String uuid, java.lang.String hostIdentifier, java.lang.String macAddress) The Constructor.

Method Summary

java.lang.String	getHostIdentifier() Gets the system Host Identifier.
java.lang.String	getMacAddress() Gets the system MAC address.
java.lang.String	getPid() Gets the Product Identifier.
java.lang.String	getSerialNumber() Gets the serial number.
java.lang.String	getSuvi() Gets the virtural identifier often used by software only devices.
java.lang.String	getUuid() Gets the universally unique identifier.
java.lang.String	getVid() Gets the Version Identifier.

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SUDI

```
public SUDI(java.lang.String pid,
            java.lang.String serialNumber,
            java.lang.String vid,
            java.lang.String suvi,
            java.lang.String uuid,
            java.lang.String hostIdentifier,
            java.lang.String macAddress)
```

The Constructor.

Parameters:
pid - Product Identifier.
serialNumber - Serial number.
vid - Version Identifier.
suvi - Virtural identifier often used by software only devices such as software routers.
uuid - Universally unique identifier.
hostIdentifier - The system Host Identifier.
macAddress - The system MAC address.

Methods

getPid

```
public java.lang.String getPid()
```

Gets the Product Identifier.

Returns:
The Product Identifier.

getSerialNumber

```
public java.lang.String getSerialNumber()
```

Gets the serial number.

Returns:
The serial number.

getVid

```
public java.lang.String getVid()
```

Gets the Version Identifier.

Returns:
The Version Identifier.

getSuvi

```
public java.lang.String getSuvi()
```

Gets the virtural identifier often used by software only devices.

Returns:
The SUVI string.

getUuid

`public java.lang.String` **`getUuid`**`()`

Gets the universally unique identifier.

Returns:
The universally unique identifier.

getHostIdentifier

`public java.lang.String` **`getHostIdentifier`**`()`

Gets the system Host Identifier.

Returns:
The system Host Identifier.

getMacAddress

`public java.lang.String` **`getMacAddress`**`()`

Gets the system MAC address.

Returns:
The system MAC address.

com.cisco.nesal.agent
Class UDI

```
java.lang.Object
    │
    +-com.cisco.nesal.agent.UDI
```

public class **UDI**
extends java.lang.Object

UDI/SUDI/VUDI structure.

This structure contains the device identifier. Different types of values will be used for different products. Most products use the PID:SN format (product id and serial number).

Any product may have one or more of these members as elements in the UDI.

When setting the UDI in this structure all fields not in use should be set to null.

Constructor Summary

public	UDI()

Method Summary

java.lang.String	getHostIdentifier() Gets the host identifier.
java.lang.String	getIPAddress() Gets the IP address.
java.lang.String	getMACAddress() Gets the MAC address.
java.lang.String	getPID() Gets the Product ID.
java.lang.String	getSN() Gets the Serial Number.
java.lang.String	getSUVI() Gets the SUVI.
java.lang.String	getUUID() Gets the UUID.
java.lang.String	getVID() Gets the VID.

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

UDI

```
public UDI()
```

Methods

getPID

```
public java.lang.String getPID()
```

Gets the Product ID.

Returns:
    The Product ID.

getSN

```
public java.lang.String getSN()
```

Gets the Serial Number.

Returns:
    The Serial Number.

getVID

```
public java.lang.String getVID()
```

Gets the VID.

Returns:
    The VID.

getSUVI

```
public java.lang.String getSUVI()
```

Gets the SUVI.

Returns:
    The SUVI.

getUUID

```
public java.lang.String getUUID()
```

Gets the UUID.

Returns:
    The UUID.

getHostIdentifier

```
public java.lang.String getHostIdentifier()
```

> Gets the host identifier.

> **Returns:**
> > The host identifier.

getMACAddress

```
public java.lang.String getMACAddress()
```

> Gets the MAC address.

> **Returns:**
> > The MAC address.

getIPAddress

```
public java.lang.String getIPAddress()
```

> Gets the IP address.

> **Returns:**
> > The IP address.

```
public java.lang.String getHostIdentifier()
```

Package
com.cisco.nesal.plugin

This packages contains plugins interface that software products must provide the implementations for. It includes:

- Communication API
- Product Dependent API
- Product Independent API
- Product Independent Certificate & Crypto API

com.cisco.nesal.plugin
Class DefaultCommunication

```
java.lang.Object
    │
    +-com.cisco.nesal.plugin.DefaultCommunication
```

All Implemented Interfaces:
> [ICommunication](#)

---

public class **DefaultCommunication**
extends java.lang.Object
implements [ICommunication](#)

This class provides the default reference implementation for ICommunication interface. Software product can use this class as example when customizing its own implementation.

Constructor Summary

public	[DefaultCommunication](#)() The constructor.

Method Summary

void	[init](#)()
java.lang.String	[sendMessage](#)([ICommunication.MessageType](#) messageType, java.lang.String messageData, java.lang.String idToken)
void	[shutdown](#)()

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Methods inherited from interface com.cisco.nesal.plugin.ICommunication
[init](#), [sendMessage](#), [shutdown](#)

Constructors

DefaultCommunication

public **DefaultCommunication**()

> The constructor.

Methods

---

init

```
public void init()
    throws SmartAgentException
```

sendMessage

```
public java.lang.String sendMessage(ICommunication.MessageType messageType,
        java.lang.String messageData,
        java.lang.String idToken)
    throws SmartAgentException
```

shutdown

```
public void shutdown()
```

com.cisco.nesal.plugin
Class DefaultCrypto

```
java.lang.Object
    │
    +-com.cisco.nesal.plugin.DefaultCrypto
```

All Implemented Interfaces:
> ICrypto

---

public class **DefaultCrypto**
extends java.lang.Object
implements ICrypto

This class provides the default reference implementation for ICrypto interface. Software product can use this class as example when customizing its own implementation.

Constructor Summary

public	DefaultCrypto() The constructor.

Method Summary

java.lang.String	generateSignature(java.lang.String key, java.lang.String data, ICrypto.MessageDigestAlgorithm digestHash)
CSR	getCSR(java.lang.String udi, CSR.CSRFormat csrOutputFormat, ICrypto.MessageDigestAlgorithm digestHash)
java.security.Message Digest	hashMessage(java.lang.String message, ICrypto.MessageDigestAlgorithm hashType)
void	init(java.lang.String rootCA)
Certificate	parseCertificate(java.lang.String cert)
void	shutdown()
boolean	validateNodeCertificate(java.lang.String cert, java.lang.String subCA, java.lang.String privateKey)
boolean	validateSignature(java.lang.String cert, java.lang.String data, java.lang.String signature, ICrypto.MessageDigestAlgorithm digestHash)
boolean	validateSigningCertificate(java.lang.String cert)

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

---

Methods inherited from interface com.cisco.nesal.plugin.ICrypto

generateSignature, getCSR, hashMessage, init, parseCertificate, shutdown, validateNodeCertificate, validateSignature, validateSigningCertificate

Constructors

DefaultCrypto

public **DefaultCrypto**()

> The constructor.

Methods

init

public void **init**(java.lang.String rootCA)

shutdown

public void **shutdown**()

generateSignature

```
public java.lang.String generateSignature(java.lang.String key,
        java.lang.String data,
        ICrypto.MessageDigestAlgorithm digestHash)
```

getCSR

```
public CSR getCSR(java.lang.String udi,
        CSR.CSRFormat csrOutputFormat,
        ICrypto.MessageDigestAlgorithm digestHash)
```

hashMessage

```
public java.security.MessageDigest hashMessage(java.lang.String message,
        ICrypto.MessageDigestAlgorithm hashType)
```

parseCertificate

public Certificate **parseCertificate**(java.lang.String cert)

validateNodeCertificate

```
public boolean validateNodeCertificate(java.lang.String cert,
          java.lang.String subCA,
          java.lang.String privateKey)
```

validateSignature

```
public boolean validateSignature(java.lang.String cert,
          java.lang.String data,
          java.lang.String signature,
          ICrypto.MessageDigestAlgorithm digestHash)
```

validateSigningCertificate

```
public boolean validateSigningCertificate(java.lang.String cert)
```

com.cisco.nesal.plugin
Class DefaultPlatformDependent

```
java.lang.Object
    │
    +-com.cisco.nesal.plugin.DefaultPlatformDependent
```

All Implemented Interfaces:
> [IPlatformDependent](#)

---

public class **DefaultPlatformDependent**
extends java.lang.Object
implements [IPlatformDependent](#)

This class provides the default reference implementation for IPlatformDependent interface. Software product can use this class as example when customizing its own implementation.

Constructor Summary

public	[DefaultPlatformDependent](#)() The constructor.

Method Summary

java.lang.String	[getSoftwareID](#)()
java.lang.String	[getTrustedStorePath](#)()
[UDI](#)	[getUDI](#)()
void	[shutdown](#)()

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Methods inherited from interface `com.cisco.nesal.plugin.IPlatformDependent`

[getSoftwareID](#), [getTrustedStorePath](#), [getUDI](#), [shutdown](#)

Constructors

DefaultPlatformDependent

public **DefaultPlatformDependent**()

> The constructor.

Methods

---

getSoftwareID

```
public java.lang.String getSoftwareID()
```

getTrustedStorePath

```
public java.lang.String getTrustedStorePath()
```

getUDI

```
public UDI getUDI()
```

shutdown

```
public void shutdown()
```

getSoftwareID

```
public java.lang.String getSoftwareID()
```

com.cisco.nesal.plugin
Class DefaultPlatformIndependent

```
java.lang.Object
    │
    +-com.cisco.nesal.plugin.DefaultPlatformIndependent
```

All Implemented Interfaces:
>   IPlatformIndependent

---

public class **DefaultPlatformIndependent**
extends java.lang.Object
implements IPlatformIndependent

This class provides the default reference implementation for IPlatformIndependent interface. Software product can use this class as example when customizing its own implementation.

Constructor Summary

public	**DefaultPlatformIndependent**() The constructor.

Method Summary

void	**debugMessage**(java.lang.String message)
void	**errorMessage**(java.lang.String message)
java.lang.String	**getCompVersion**()
java.lang.String	**getHostname**()
java.util.Locale	**getLocale**()
void	**shutdown**()
void	**syslog**(IPlatformIndependent.SysLogSeverity severity, java.lang.String message)
void	**traceMessage**(java.lang.String message)

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Methods inherited from interface com.cisco.nesal.plugin.IPlatformIndependent
debugMessage, errorMessage, getCompVersion, getHostname, getLocale, shutdown, syslog, traceMessage

Constructors

DefaultPlatformIndependent

public **DefaultPlatformIndependent**()

> The constructor.

Methods

getLocale

public java.util.Locale **getLocale**()

shutdown

public void **shutdown**()

getHostname

public java.lang.String **getHostname**()

getCompVersion

public java.lang.String **getCompVersion**()

syslog

public void **syslog**([IPlatformIndependent.SysLogSeverity](#) severity,
        java.lang.String message)

debugMessage

public void **debugMessage**(java.lang.String message)

errorMessage

public void **errorMessage**(java.lang.String message)

traceMessage

```
public void traceMessage(java.lang.String message)
```

traceMessage

```
public void traceMessage(java.lang.String message)
```

com.cisco.nesal.plugin
Interface ICommunication

All Known Implementing Classes:
> DefaultCommunication

---

public interface **ICommunication**
extends

The Communication interface provides the interface between the Smart Agent and client transport layer component such as call home transport which sends license information to Cisco backend service and receive response from Cisco backend service.

Nested Class Summary

class	ICommunication.MessageType ICommunication.MessageType

Method Summary

void	init() Initializes the communications layer.
java.lang.String	sendMessage(ICommunication.MessageType messageType, java.lang.String messageData, java.lang.String idToken) Sends message to licensing backend.
void	shutdown() Shuts down the communications layer.

Methods

init

```
public void init()
  throws SmartAgentException
```

Initializes the communications layer.

This method will be called after the agent determines the software product has been fully initialized by calling the software Product Independent initialization method.

If the init method fails the agent will retry every 1 minute.

Throws:
> SmartAgnetException - On an error the exception will contain error code and message.

---

sendMessage

```
public java.lang.String sendMessage(ICommunication.MessageType messageType,
        java.lang.String messageData,
        java.lang.String idToken)
  throws SmartAgentException
```

Sends message to licensing backend. This is the common API that Smart Agent can use to send all types of smart agent license message SmartAgentMessage_t through transport layer to Cisco backend Service.For example, we can invoke Call Home client message send API here.

The license message data that generated by smart agent will be contained in the messageData string.

The response message received from Cisco backend service through client transport will be contained in the returned string and passed to Smart Agent.

Parameters:

messageType - Smart Agent message type.

messageData - Data in string format that holds the license message.

idToken - The idToken used for registration. This is needed by call home and will be passed only when we send the first register message.

Returns:

A string containing the response message data.

Throws:

SmartAgentException - On an error the exception will contain error code and message.

shutdown

```
public void shutdown()
```

Shuts down the communications layer.

This will be called if the agent is disabled or shut down gracefully.

com.cisco.nesal.plugin
Class ICommunication.MessageType

```
java.lang.Object
    |
    +–java.lang.Enum
        |
        +-com.cisco.nesal.plugin.ICommunication.MessageType
```

All Implemented Interfaces:
java.io.Serializable, java.lang.Comparable

---

public static final class **ICommunication.MessageType**
extends java.lang.Enum

Message type when communicating with licensing backend via ICommunication.sendMessage method.

Field Summary

public static final	SmartAgentMessageACK ACKNOWLEDGEMENT
public static final	SmartAgentMessageAUTH ENTITLEMENT
public static final	SmartAgentMessageGETRESPONSE GETRESP
public static final	SmartAgentMessageInvalid invalid
public static final	SmartAgentMessageMETER USAGE
public static final	SmartAgentMessageReg REGISTRATION
public static final	SmartAgentMessageRenew RENEW
public static final	SmartAgentMessageUnReg DEREGISTRATION

Method Summary

static ICommunication.MessageType	valueOf(java.lang.String name)
static ICommunication.MessageType[]	values()

Methods inherited from class java.lang.Enum
clone, compareTo, equals, finalize, getDeclaringClass, hashCode, name, ordinal, toString, valueOf

---

Methods inherited from class `java.lang.Object`

```
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait,
wait
```

Methods inherited from interface `java.lang.Comparable`

```
compareTo
```

Fields

SmartAgentMessageInvalid

```
public static final com.cisco.nesal.plugin.ICommunication.MessageType
SmartAgentMessageInvalid
```

invalid

SmartAgentMessageReg

```
public static final com.cisco.nesal.plugin.ICommunication.MessageType
SmartAgentMessageReg
```

REGISTRATION

SmartAgentMessageUnReg

```
public static final com.cisco.nesal.plugin.ICommunication.MessageType
SmartAgentMessageUnReg
```

DEREGISTRATION

SmartAgentMessageAUTH

```
public static final com.cisco.nesal.plugin.ICommunication.MessageType
SmartAgentMessageAUTH
```

ENTITLEMENT

SmartAgentMessageMETER

```
public static final com.cisco.nesal.plugin.ICommunication.MessageType
SmartAgentMessageMETER
```

USAGE

SmartAgentMessageACK

```
public static final com.cisco.nesal.plugin.ICommunication.MessageType
SmartAgentMessageACK
```

ACKNOWLEDGEMENT

SmartAgentMessageRenew

```
public static final com.cisco.nesal.plugin.ICommunication.MessageType
SmartAgentMessageRenew
```

RENEW

SmartAgentMessageGETRESPONSE

```
public static final com.cisco.nesal.plugin.ICommunication.MessageType
SmartAgentMessageGETRESPONSE
```

GETRESP

Methods

values

```
public static ICommunication.MessageType[] values()
```

valueOf

```
public static ICommunication.MessageType valueOf(java.lang.String name)
```

com.cisco.nesal.plugin
Interface ICrypto

All Known Implementing Classes:
> DefaultCrypto

---

public interface **ICrypto**
extends

This is the interface between the agent and the Crypto/Certificate services available on the software product.

Brief description of how the Certificates are used: The CSR request is sent to backend after generating a key pair. The response received will have the Node Certificate, Signing Certificate and the Licensing SubCa. The Signing Certificate also known as MMI Respone Signing Certificate. The Node Certificate a.k.a ID Certificate is the MMI Request Signing Certificate.

MMI Request messages from the Smart Agent are signed using the Node Certificate's private key and backend will verify the signature on them to prove they were not alter enroute.

MMI response message from backend are signed using the Signing Certificate's private key and the Smart Agent verified the signature on the message using the Signing Certificate previously received as a part of CSR process.

Nested Class Summary

class	`ICrypto.MessageDigestAlgorithm` ICrypto.MessageDigestAlgorithm

Method Summary

java.lang.String	`generateSignature`(java.lang.String key, java.lang.String data, `ICrypto.MessageDigestAlgorithm` algorithm) Creates a message signature.
CSR	`getCSR`(java.lang.String udi, `CSR.CSRFormat` csrOutputFormat, `ICrypto.MessageDigestAlgorithm` algorithm) Creates a Certificate Signing Request (CSR).
java.security.Message Digest	`hashMessage`(java.lang.String message, `ICrypto.MessageDigestAlgorithm` algorithm) Creates a message digest with the specified algorithm.
void	`init`(java.lang.String rootCA) Initializes the Crypto with the root CA to be used for validation of node certitificate and signing certificate To replace the existing rootCA, call this API with new rootCA.
Certificate	`parseCertificate`(java.lang.String cert) Parses a certificate.
void	`shutdown`() Shuts down Crypto.
boolean	`validateNodeCertificate`(java.lang.String cert, java.lang.String subCA, java.lang.String privateKey) Validates Node Certificate with the root CA.

boolean	`validateSignature`(java.lang.String cert, java.lang.String data, java.lang.String signature, `ICrypto.MessageDigestAlgorithm` algorithm) Validate a message signature Using the Crypto functions validate a signature using the public keys.
boolean	`validateSigningCertificate`(java.lang.String cert) Validate Signing Certificate with the root CA.

Methods

init

public void **init**(java.lang.String rootCA)

Initializes the Crypto with the root CA to be used for validation of node certitificate and signing certificate To replace the existing rootCA, call this API with new rootCA.

Parameters:
    rootCA - The Root certificate to import into the trust store for validation of the trust chain of Node Certificate.

shutdown

public void **shutdown**()

Shuts down Crypto. This will be called when the agent shuts down. it should free any resources that were allocated.

generateSignature

public java.lang.String **generateSignature**(java.lang.String key,
        java.lang.String data,
        `ICrypto.MessageDigestAlgorithm` algorithm)

Creates a message signature.

Use this method to create a signature for data. MMI Request sent to the backend are signed using the Node Certificate's private Key.

Parameters:
    key - The private key to use for signature generation. This parameter will be null in case the caller is not taking care of private key trusted storage.
    data - The data to sign for.
    algorithm - Hash algorithm to be used, one of MessageDigestAlgorithm.

Returns:
    The signature in String format.

getCSR

public `CSR` **getCSR**(java.lang.String udi,
        `CSR.CSRFormat` csrOutputFormat,
        `ICrypto.MessageDigestAlgorithm` algorithm)

Creates a Certificate Signing Request (CSR).

Use this method to create a Certificate Signing Request.

Parameters:
    udi - The UDI or GUID of the product, which is used to populate the Common Name in CSR.

csrOutputFormat - The format of the output of CSR .

algorithm - The message digest algorithm to be used while signing the CSR.

Returns:

A CSR object which containss a public key and raw CSR string.

hashMessage

```
public java.security.MessageDigest hashMessage(java.lang.String message,
        ICrypto.MessageDigestAlgorithm algorithm)
```

Creates a message digest with the specified algorithm.

Parameters:

message - The message data to be hashed.

algorithm - The message digest algorithm to use (e.g., MD5, SHA256, etc).

Returns:

The message digest.

parseCertificate

```
public Certificate parseCertificate(java.lang.String cert)
```

Parses a certificate.

Use this method to parse a certificate and return a Certificate object.

Parameters:

cert - The certificate to parse in any of the formats, e,g, DER, PEM.

Returns:

A CertificateInfo object

validateNodeCertificate

```
public boolean validateNodeCertificate(java.lang.String cert,
        java.lang.String subCA,
        java.lang.String privateKey)
```

Validates Node Certificate with the root CA.

Use the method to validate Node Certificate with the root CA. The Node Certificate is signed with Licensing Sub CA certificate which in turns is signed using the Root CA certificate. So the certificate chain has to be validated. Also a double check is done to make sure the public key contained in the Node certificate is the other half of the key pair generate as part of CSR by signing a test message with private key and verifying the signature using the public key present in the Node certificate.

Parameters:

cert - The Node certificate to use for validation in any of the formats of DER, Base64, PEM.

subCA - The Licensing SubCA Cert to use in any of the formats of DER, Base64 and PEM.

privateKey - The private key stored in trust storage by caller is passed else will be null.

Returns:

True if the cert is valid; false otherwise.

validateSignature

```
public boolean validateSignature(java.lang.String cert,
          java.lang.String data,
          java.lang.String signature,
          ICrypto.MessageDigestAlgorithm algorithm)
```

Validate a message signature Using the Crypto functions validate a signature using the public keys.

MMI Response message received are signed by the Signing Certificate's private key So we need to validate the signature using the public key embedded in the Signing Certificate.

Parameters:
> cert - The Node certificate to use for validation in any of the formats of DER, Base64, PEM.
> data - The data to verify the signature for
> signature - The signature to validate
> algorithm - The message digest algorithm to be used while signing the CSR.

Returns:
> True if the signature is valid; false otherwise.

validateSigningCertificate

```
public boolean validateSigningCertificate(java.lang.String cert)
```

Validate Signing Certificate with the root CA. Using the Crypto functions validate Signing certificate with the root CA The signing cert is signed by the root CA directly and hence we need to validate against the root CA only.

Parameters:
> cert - The Signing certificate to use for validation in any of the formats of DER, Base64, PEM.

Returns:
> True if the cert is valid; false otherwise.

com.cisco.nesal.plugin
Class ICrypto.MessageDigestAlgorithm

```
java.lang.Object
    │
    +-java.lang.Enum
        │
        +-com.cisco.nesal.plugin.ICrypto.MessageDigestAlgorithm
```

All Implemented Interfaces:
java.io.Serializable, java.lang.Comparable

---

public static final class **ICrypto.MessageDigestAlgorithm**
extends java.lang.Enum

Type of algorithm supported for message digest.

Field Summary

public static final	MD5 MD5 is to be used for the hash.
public static final	SHA1 SHA1 is to be used for the hash.
public static final	SHA256 SHA256 is to be used for the hash.

Method Summary

static ICrypto.MessageDigestAlgorithm	valueOf(java.lang.String name)
static ICrypto.MessageDigestAlgorithm[]	values()

Methods inherited from class java.lang.Enum

clone, compareTo, equals, finalize, getDeclaringClass, hashCode, name, ordinal, toString, valueOf

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Methods inherited from interface java.lang.Comparable

compareTo

Fields

MD5

`public static final com.cisco.nesal.plugin.ICrypto.MessageDigestAlgorithm` **`MD5`**

> MD5 is to be used for the hash.

SHA1

`public static final com.cisco.nesal.plugin.ICrypto.MessageDigestAlgorithm` **`SHA1`**

> SHA1 is to be used for the hash.

SHA256

`public static final com.cisco.nesal.plugin.ICrypto.MessageDigestAlgorithm` **`SHA256`**

> SHA256 is to be used for the hash.

Methods

values

`public static` [`ICrypto.MessageDigestAlgorithm[]`](#) **`values`**`()`

valueOf

`public static` [`ICrypto.MessageDigestAlgorithm`](#) **`valueOf`**`(java.lang.String name)`

com.cisco.nesal.plugin
Interface IPlatformDependent

All Known Implementing Classes:
> DefaultPlatformDependent

---

public interface **IPlatformDependent**
extends

This interface will be implemented by the software product so the agent can get Platform Dependent (PD) information.

Method Summary

java.lang.String	getSoftwareID() Gets the software product name and version.
java.lang.String	getTrustedStorePath() Gets the path to the trusted storage directory.
UDI	getUDI() Gets the UDI of this device.
void	shutdown() Shuts down the object..

Methods

getSoftwareID

public java.lang.String **getSoftwareID**()

Gets the software product name and version. This will be sent back to the licensing cloud to help identify this software product

Returns:
> The Software tag name.

---

getTrustedStorePath

public java.lang.String **getTrustedStorePath**()

Gets the path to the trusted storage directory.

The Agent will use this path to write out data that needs to be protected. The customer should not have access to this area. This will be called during init method.

As of version 1.0 the Agent will write two certificates and some other persistence data. Three files will be created and will use approximately 6k of space.

Returns:
> The path to the trusted storage directory.

---

getUDI

```
public UDI getUDI()
```

Gets the UDI of this device.

Calls the PD code to get the UDI of this device. This will be called during system boot and periodically at run time.

Example: if the UDI consists of the PID and SN then the implementation will fill the pid and sn members of the returnUDI object. All other members will be set to null.

Returns:
The UDI of this device.

shutdown

```
public void shutdown()
```

Shuts down the object..

This is the last call made to the software product library. It will be called if the agent is shutdown gracefully.

getUDI

```
public UDI getUDI()
```

com.cisco.nesal.plugin
Interface IPlatformIndependent

All Known Implementing Classes:

DefaultPlatformIndependent

---

public interface **IPlatformIndependent**
extends

This interface will be implemented by the software product so the agent can get Platform Independent (PD) information.

Notes about enabling Smart Agent debug logs: Debug logging in the API can be enabled at runtime to display more information to your logger, for example, log4j, java.util.logging, etc. The API uses SLF4J (http://www.slf4j.org/) internally as a facade for various logging frameworks and allows the application to plug in the desired logging framework at deployment time. If no logging framework is found on the class path, then SLF4J defaults to a no-operation implementation.

You should use the mechanism provided by your logging framework to configure logging level and output destination. The following example shows how to configure API debug logging if you use log4j.

Nested Class Summary

class	`IPlatformIndependent.SysLogSeverity`
	IPlatformIndependent.SysLogSeverity

Method Summary

void	`debugMessage`(java.lang.String message)
	Writes a debug message to the debug log or the console if debugging is enabled.
void	`errorMessage`(java.lang.String message)
	Writes an error message to the error log or the console.
java.lang.String	`getCompVersion`()
	Gets the version of Smart Agent and dependent components.
java.lang.String	`getHostname`()
	Gets the hostname string for the device.
java.util.Locale	`getLocale`()
	Gets the Locale object represents a specific geographical, political, or cultural region.
void	`shutdown`()
	Shuts down the PI interface to the agent.
void	`syslog`(`IPlatformIndependent.SysLogSeverity` severity, java.lang.String message)
	Writes a syslog message.
void	`traceMessage`(java.lang.String message)
	Writes the trace message into the system trace buffer.

Methods

---

getLocale

`public java.util.Locale` **`getLocale`**`()`

> Gets the Locale object represents a specific geographical, political, or cultural region.
>
> This locale is sent in every message to the Cisco licensing receiver and so this function will be called for every message sent.
>
> **Returns:**
>> The Locale object represents a specific geographical, political, or cultural region.

shutdown

`public void` **`shutdown`**`()`

> Shuts down the PI interface to the agent.
>
> This is the last call the agent will make before it shuts down to free any resources allocated by init method.

getHostname

`public java.lang.String` **`getHostname`**`()`

> Gets the hostname string for the device.
>
> This hostname will be sent, in the registration message, to Cisco.
>
> **Returns:**
>> The hostname string.

getCompVersion

`public java.lang.String` **`getCompVersion`**`()`

> Gets the version of Smart Agent and dependent components.
>
> **Returns:**
>> The version of Smart Agent and dependent components in string form.

syslog

`public void` **`syslog`**`(`[IPlatformIndependent.SysLogSeverity]` severity,`
`        java.lang.String message)`

> Writes a syslog message.
>
> Extra information such as time stamp should be added by the software product.
>
> **Parameters:**
>> `severity` - The severity level of the message.
>> `message` - The message to write to syslog.

debugMessage

`public void` **`debugMessage`**`(java.lang.String message)`

> Writes a debug message to the debug log or the console if debugging is enabled.

Parameters:
> `message` - The message to write.

errorMessage

```
public void errorMessage(java.lang.String message)
```

Writes an error message to the error log or the console.

Parameters:
> `message` - The message to write.

traceMessage

```
public void traceMessage(java.lang.String message)
```

Writes the trace message into the system trace buffer.

Parameters:
> `message` - The message to add to the trace buffer.

com.cisco.nesal.plugin
Class IPlatformIndependent.SysLogSeverity

```
java.lang.Object
    │
    +–java.lang.Enum
        │
        +–com.cisco.nesal.plugin.IPlatformIndependent.SysLogSeverity
```

All Implemented Interfaces:
java.io.Serializable, java.lang.Comparable

---

public static final class **IPlatformIndependent.SysLogSeverity**
extends java.lang.Enum

Severity of a syslog message.

Field Summary

public static final	ALERT action must be taken immediately
public static final	CRIT critical conditions
public static final	DEBUG debug-level messages
public static final	EMERG system is unusable
public static final	ERR error conditions
public static final	INFO informational
public static final	NOTICE normal but significant condition
public static final	WARNING warning conditions

Method Summary

static IPlatformIndependent. SysLogSeverity	valueOf(java.lang.String name)
static IPlatformIndependent. SysLogSeverity[]	values()

Methods inherited from class java.lang.Enum
clone, compareTo, equals, finalize, getDeclaringClass, hashCode, name, ordinal, toString, valueOf

---

Methods inherited from class `java.lang.Object`

```
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait,
wait
```

Methods inherited from interface `java.lang.Comparable`

```
compareTo
```

Fields

EMERG

public static final com.cisco.nesal.plugin.IPlatformIndependent.SysLogSeverity **EMERG**

> system is unusable

ALERT

public static final com.cisco.nesal.plugin.IPlatformIndependent.SysLogSeverity **ALERT**

> action must be taken immediately

CRIT

public static final com.cisco.nesal.plugin.IPlatformIndependent.SysLogSeverity **CRIT**

> critical conditions

ERR

public static final com.cisco.nesal.plugin.IPlatformIndependent.SysLogSeverity **ERR**

> error conditions

WARNING

public static final com.cisco.nesal.plugin.IPlatformIndependent.SysLogSeverity **WARNING**

> warning conditions

NOTICE

public static final com.cisco.nesal.plugin.IPlatformIndependent.SysLogSeverity **NOTICE**

> normal but significant condition

INFO

public static final com.cisco.nesal.plugin.IPlatformIndependent.SysLogSeverity **INFO**

> informational

DEBUG

public static final com.cisco.nesal.plugin.IPlatformIndependent.SysLogSeverity **DEBUG**

> debug-level messages

Methods

values

public static IPlatformIndependent.SysLogSeverity[] **values**()

valueOf

public static IPlatformIndependent.SysLogSeverity **valueOf**(java.lang.String name)