

VERISIGN BUNDLE EPP SDK PROGRAMMER'S GUIDE

Version 1.30.0

October 1, 2026

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Change Log

Author(s)	Date	Revision	Description
James F. Gould	05/30/2013	1.0.0	Initial Revision
James F. Gould	08/14/2013	1.1.0	Updated “Figure 24 – Domain Create in Sunrise Create Form Example” to the EPPEncodedSignedMark class and added description of changes in version 1.1.0.
James F. Gould	09/04/2013	1.1.1	Updated the changes for version 1.1.0, and Related Domain Extension section, to support the Domain Info Form and the Related Info Form of the Related Domain Extension. Also added support for the multiple related domain transform commands to the Related Domain Extension.
James F. Gould	05/01/2014	1.2.0	Updated the Changes from Previous Version section to include the information for the 1.2.0, 1.3.0, and 1.4.0 releases.
James F. Gould	04/07/2015	1.3.0	Added the new extensions including: Change Poll Mapping (changepoll), Registry Fee Extension (fee), Allocation Token Extension (allocationtoken), IDN Map Extension (idnmap), and the IDN Table Mapping (idntable). The Launch Phase Extension (launch) was updated to be compliant with draft-ietf-eppext-launchphase-05. Also added the subID attribute to the Suggestion Mapping (suggestion).
James F. Gould	11/2/2015	1.4.0	Added the new extensions including: Verification Code Extension (verificationcode) and China Name Verification Mapping (vsp).
James F. Gould	11/10/2015	1.4.1	Bumped up the reference of the Verification Code Extension to version 02.
James F. Gould	12/3/2015	1.5.0	Added information for the 1.7.0 release of the EPP SDK
James F. Gould	2/18/2016	1.8.0	Added information for the 1.8.0 release of the EPP SDK.
James F. Gould	3/25/2016	1.9.0	Updated some of the SSLProtocol configuration description.
James F. Gould	4/20/2016	1.10.0	Added support for draft-brown-epp-fees-07.
James F. Gould	10/7/2016	1.11.0	Added support for session pool client transaction identifier generator configuration.
James F. Gould	12/16/2016	1.12.0	Add description of supporting relaxed contact validation and the use of the new optional EPP.Contact.RelaxedValidation epp.config property.
James F. Gould	2/16/2017	1.12.1	Add description of supporting enabling or disabling the use of an Entity Resolver with the use of the new optional EPP.UseEntityResolver epp.config property.
James F. Gould	8/1/2017	1.12.2	Added description of the optional EPP.SendReceiveLogger property for setting the logger used for sent and received packets.

James F. Gould	4/16/2018	1.13.0	Added support and configuration settings associated with the Login Security EPP Extension.
James F. Gould	5/1/2018	1.13.1	Replaced references of reseller and resellerext to org and orgext.
James F. Gould	7/2/2018	1.13.2	Added definition of the optional EPP.PollMessageFilter property.
James F. Gould	8/6/2018	1.13.3	Added the definition of the EPP.RegistryPolicyAdapters property.
James F. Gould	9/4/2018	1.13.4	Removed WhoWas and Suggestion for the SDK.
James F. Gould	9/7/2018	1.13.5	Updated to support draft-ietf-regext-epp-fees-13.
James F. Gould	9/24/2018	1.13.6	Added support for draft-gould-regext-login-security-policy-00 and updated some of the referenced draft versions.
James F. Gould	10/15/2018	1.13.7	Added support for draft-ietf-regext-validate-04.
James F. Gould	10/25/2018	1.13.8	Added support for draft-gould-carney-regext-registry-04.
James F. Gould	1/17/2019	1.13.9	Updated some of the referenced drafts and RFCs. Also updated the change log for the 1.11.0 release.
James F. Gould	2/20/2019	1.13.10	Updated the 1.11.0 change log to include support for Java 11 and to reflect the change from base support of Java 7 to Java 8.
James F. Gould	5/13/2019	1.13.11	Revised the version of the supported Internet Drafts and RFC's including the registry fee extension, the change poll extension, the organization mapping, and the organization extension.
James F. Gould	6/19/2019	1.14.0	Added references to the 1.12.0 release.
James F. Gould	6/24/2019	1.14.1	Made corrections to the Introduction and other small corrections elsewhere.
James F. Gould	12/13/2019	1.15.0	Updated documentation on the build, based on the replacement of Ant with Gradle.
James F. Gould	6/19/2020	1.16.0	Configuration setting changes based on conversion from Apache Commons Pool 1 to 2.
James F. Gould	6/22/2020	1.17.0	Replaced PoolMan with the use of Apache Commons Pool 2 for the Parser and Transformer pools.
James F. Gould	9/2/2020	1.18.0	Added the EPP.ReadTimeOut property
James F. Gould	9/28/2020	1.19.0	Added the definition of the EPP.SessionPool.minAbsoluteTimeout, EPP.SessionPoo.maxAbsoluteTimeout, EPP.SessionPool.<system>.minAbsoluteTimeout, and EPP.SessionPoo.<system>.maxAbsoluteTimeout properties.
James F. Gould	12/15/2020	1.20.0	Revised the domain names for the Verisign registries systems.
James F. Gould	4/19/2021	1.21.0	Updated the logging configuration information to leverage SLF4J along with auto-discovered backend loggers including

			logback, Lo4J 1.2, and Log4J 2. The default backend logger will be set to Log4J 2. Added the Maintenance Notification EPP Extension to the bundle. Removed the JOBS Contact EPP Extension.
James F. Gould	7/1/2021	1.22.0	1. Removed the Premium Domain Extension 2. Remove reference to the non-RFC 8748 versions of Registry Fee Extension.
James F. Gould	1/11/2022	1.23.0	Updates that include: 1. Replaced setPreWhois and setPostWhois references to setPreData and setPostDaa, respectiviely. 2. Added a reference to the Secure Authorization Information for Transfer RFC 9154. 3. Updated the reference of the Registry Maintenance Notification from the draft to RFC 9167
James F. Gould	1/28/2022	1.24.0	Added support for Use of Internationalized Email Addresses in the EPP (draft-ietf-regext-epp-eai).
James F. Gould	6/25/2024	1.25.0	Added the TTL Extension and added the new session pool initSessionOnMake properties.
James F. Gould	9/3/2024	1.26.0	Added the HTTP transport (EoH) based on draft-loffredo-regext-epp-over-http. EoH is pluggable with EoT and can be tested in parallel with EoT.
James F. Gould	10/10/2024	1.27.0	Added the QUIC transport (EoQ) based on draft-yao-regext-epp-quic. EoQ is pluggable with EoT and can be tested in parallel with EoT. Also cleaned up some old content and adding some missing content.
James F. Gould	12/4/2024	1.28.0	Updated Section 6.5 “Libraries” to reference the Gradle “libs.gradle” file for the libraries dependencies of the distribution.
James F. Gould	5/13/2025	1.29.0	Added the Change Mapping and Change Extension to the Verisign Bundle
James F. Gould	10/1/2026	1.30.0	Added the following extensions: 1. EPP Balance Mapping (IETF) 2. EPP Key Relay Mapping 3. EPP Authentication Token Mapping 4. EPP Status Set Extension 5. EPP Server Validation Extension

References

Author(s)	Title	Revision	Date
Scott Hollenbeck	Extensible Provisioning Protocol		8/2009
Scott Hollenbeck	Extensible Provisioning Protocol (EPP) Transport Over TCP		8/2009
Scott Hollenbeck	Extensible Provisioning Protocol (EPP) Domain Name Mapping		8/2009
Scott Hollenbeck	Extensible Provisioning Protocol (EPP) Host Mapping		8/2009
Scott Hollenbeck	Extensible Provisioning Protocol (EPP) Contact Mapping		8/2009
Scott Hollenbeck	Domain Registry Grace Period Mapping for the Extensible Provisioning Protocol		4/16/2004
Scott Hollenbeck	ConsoliDate Mapping for the Extensible Provisioning Protocol	01	3/22/2005
Scott Hollenbeck	Domain Name System (DNS) Security Extensions Mapping for the Extensible Provisioning Protocol (EPP)		11/2005
James F. Gould	EPP RGP Poll Mapping	00	12/10/2013
James F. Gould and Mahendra Jain	EPP Low Balance Mapping	00	12/10/2013
James F. Gould	IDN Language Tag	00	12/10/2013
James F. Gould and Srikanth Veeramachaneni	Whois Info Extension	00	1/10/2014
James Gould and Scott Hollenbeck	RFC 5910 – Domain Name System (DNS) Security Extensions Mapping for the Extensible Provisioning Protocol		5/2010
James F. Gould and Jeff Faust	Client Object Attribute Extension Mapping	00	1/2/2014
James F. Gould	Versign Balance Mapping	00	12/16/2013
James F. Gould	Defensive Registration Mapping	1.2	
James F. Gould	Email Forwarding Mapping	1.2	
James F. Gould	RFC 8334 - Launch Phase Extension		3/2018

Wil Tan Gavin Brown			
James F. Gould	Personal Registration Extension Mapping	1.2	
James F. Gould	Verisign Registry Mapping	00	1/10/2014
James F. Gould Nagesh Chigurupali Srikanth Veeramachaneni	Related Domain Extension Mapping	00	1/2/2014
James F. Gould	Namestore Extension Mapping	00	12/10/2013
James F. Gould Kal Feher (Neustar)	RFC 8495 - Allocation Token Extension		11/2018
James F. Gould Trung Tran (Neustar)	RFC 8590 - Change Poll Extension		5/2019
James F. Gould Franscisco Obispo (Uniregistry) Luis Enrique Munoz (Uniregistry)	Internationalized Domain Name (IDN) Table Mapping	07	10/15/2018
Franscisco Obispo (Uniregistry) Luis Enrique Munoz (Uniregistry)	Internationalized Domain Name Mapping Extension	02	1/5/2015
Roger Carney (GoDaddy) Gavin Brown (CentralNic)	RFC 8748 – Registry Fee Extension		3/2020
James F. Gould	Verification Code Extension	06	1/10/2019
Xie Jiagui Liu Hongyan (Teleinfo) James F. Gould	China Name Verification Mapping	00	10/26/2016
L. Zhou	RFC 8543 - Organization Mapping		4/2019

N. Kong X. Lee (CNNIC) C. Qi (Teleinfo) James F. Gould			
L. Zhou N. Kong X. Lee (CNNIC) C. Qi (Teleinfo) James F. Gould	RFC 8544 - Organization Extension		4/2019
James F. Gould	RFC 8807 – Login Security Extension		8/2020
James F. Gould Lin Jia (Verisign) Roger Carney Jody Kolker (GoDaddy)	Registry Mapping	04	10/22/2018
James F. Gould	Launch Phase Policy Extension	01	8/17/2018
James F. Gould	Login Security Policy Extension	03	1/16/2019
Roger Carney Joseph Snitker	Validate Mapping	04	10/11/2018
James F. Gould Martin Casanova (SWITCH)	RFC 9038 - Unhandled Namespaces		5/2021
Tobias Sattler Roger Carney Jody Kolker	RFC 9167 - Registry Maintenance Notifications		12/2021

James F. Gould Rick Wilhelm	RFC 9154 – Secure Authorization Information for Transfer		12/2021
Gavin Brown (ICANN)	EPP Time-to-Live Extension		6/2025
Dmitry Belyavskiy James F. Gould Scott Hollenbeck	RFC 9873 - Additional Email Address Extension		10/2025
Mario Loffredo (.IT) Lorenzo Luconi Trombacchi (.IT) Maurizio Martinelli (.IT) Dan Keathley James F. Gould	EPP Transport over HTTPS	05	9/8/2026
Jiankang Yao (CNNIC) Hongtao Li (CNNIC) Man Zhang (CNNIC) Daniel Keathley James Gould	EPP Transport over QUIC	12	7/6/2026
Poonam Garg James F. Gould John Colosi	EPP Change Mapping	01	9/21/2026
Poonam Garg James F. Gould John Colosi	EPP Change Extension	01	9/21/2026
James F. Gould Werner Staub (CORE) Dimitrios Melissovas	EPP Balance Mapping	01 02 03	4/13/2026 8/14/2026 9/24/2026
Rik Ribbers (SIDN) Marc Groeneweg (SIDN) Miek Gieben (SIDN) Antoin Verschuren (SIDN)	RFC 8063 - EPP Key Relay Mapping		2/2017
James F. Gould Poonam Garg	EPP Authentication Token Mapping	00	7/20/2026

Mohammad Suhale Malang Khader			
James F. Gould Poonam Garg Mohammad Suhale Malang Khader	EPP Status Set Extension	03 04	8/17/2026 9/2/2026
James F. Gould Sandra Gould Tanya Sutan-Tanon	EPP Server Validation Extension	00	9/19/2026

Definitions, Acronyms, and Abbreviations

Term	Description
CTLD	Consolidated Top-Level Domain
DNS	Domain Name System
DS	Delegation Signer
EPP	Extensible Provisioning Protocol
IDN	Internationalized Domain Name
IETF	http://www.ietf.org/
RFC	Request for Comments
RGP	Registry Grace Period
SDK	Software Development Kit
SSL	http://home.netscape.com/eng/ssl3/ssl-toc.html
TLS	http://www.ietf.org/rfc/rfc2246.txt?number=2246
XML	http://www.w3c.org/XML/

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1. Introduction

This document provides instructions on how to use the Verisign Bundle Extensible Provisioning Protocol (EPP) Software Development Kit (SDK) includes all the API's required to interface with the Verisign EPP servers that include:

a. COM/NET (COMNET) Shared Registry System (SRS), hereon referred to as COMNET, supports the .COM and .NET TLDs. The COMNET commands require the NameStore Extension for specifying the target registry. The Registry Mapping can be used to provide the list of available TLDs as well as the feature and policy information for the TLDs.
b. Consolidated Top Level Domain (CTLD) Shared Registry System (SRS), hereon referred to as CTLD, supports .CC, .NAME, and new gTLDs. CTLD commands require the Namestore Extension for specifying the target registry. The Registry Mapping can be used to provide the list of available TLDs as well as the feature and policy information for the TLDs.

The SDK includes a full implementation of the EPP specifications independent of the services supported by the Registry services (i.e. CTLD and COMNET). The `com.verisign.epp.interfaces.EPPDomain` and `com.verisign.epp.interfaces.EPPHost` fully support the IETF Domain and Host mappings, while `com.verisign.namestore.interfaces.NSDomain` and `com.verisign.namestore.interfaces.NSHost` provide convinence sub-classes for easily passing the Namestore Extension and for supporting extension API's like Sync and RGP Restore Request/Report. The SDK also provides a Stub Server that can run over TCP, SSL, HTTP, HTTPS, and QUIC and a set of test client code (`*Tst.java`) that validates the SDK API's and can be used as samples. For example, `com.verisign.epp.namestore.interfaces.NSPollTst` includes sample code for processing each of the supported poll messages produced by CTLD and the COMNET.

The instructions provided include an overview of the Verisign Bundle EPP SDK, how to configure it, how to use it, and how to extend it. Please see http://www.verisigninc.com/en_US/products-and-services/domain-name-services/registry-products/epp-sdk for updates to the Programmer's Guide between Verisign Bundle EPP SDK releases.

The Verisign Bundle EPP SDK provide detailed interface information in HTML Javadoc. This document does not duplicate the detailed interface information contained in the HTML Javadoc. Descriptions are provided of the main interface elements, the pre-conditions, the post-conditions, and example code.

It is assumed that the reader has reviewed the associated EPP specifications and has a general understanding of the EPP concepts. Much of the EPP details are encapsulated in the SDK, but having a solid understanding of the EPP concepts will help in effectively using the SDK.

2. Changes from Previous Version

Refer to the changelog.txt file included in the bundles/verisign/doc directory for a change history of the Verisign Bundle EPP SDK.

3. Supported Transports

The SDK supports the following transports:

1. TCP and SSL – The default configuration of the SDK is to use the SSL transport, but the SDK can be configured to use TCP. The TCP and the SSL transports follow RFC 5734 “Extensible Provisioning Protocol (EPP) Transport Over TCP”, referred to as EoT.
2. HTTP and HTTPS – An optional configuration of the SDK is to use the HTTP or HTTPS transport, referred to as EoH, which can be configured for the client and uses a different EoH Stub Server than the EoT Stub Server.
3. QUIC – An optional configuration of the SDK is to use the QUIC transport, referred to as EoQ, which can be configured for the client and uses a different EoQ Stub Server than the EoT Stub Server.

4. Quick Start Instructions

The Verisign Bundle EPP SDK is distributed in two forms, a source code distribution and a binary distribution. Both distributions are preconfigured to run a TCP/IP Stub Server and include a suite of tests that run against the TCP/IP Stub Server. The Stub Server is described in section 10. The following steps are common to either transport:

1. Uncompress the Verisign Bundle EPP SDK. With the source distribution, the Unix filename is ***epp-verisign--${BUILD_VER}-src.tar.gz*** and the Windows filename is ***epp-verisign-${BUILD_VER}-src.zip***. With the binary distribution, the Unix filename is ***epp-verisign-${BUILD_VER}-bin.tar.gz*** and the Windows filename is ***epp-verisign-${BUILD_VER}-bin.zip***. ***${BUILD_VER}*** is the version number for the release (e.g 1.0.0).
2. Change to the Verisign Bundle EPP SDK directory: ***epp-verisign-${BUILD_VER}/bundles/verisign***
3. Edit any configuration changes in ***epp.config*** for EoT, ***epp-http.config*** for EoH, and ***epp-quic.config*** for EoQ.
4. Execute one of the Gradle tasks defined in Table 1 – Verisign Bundle Gradle Tasks. If Gradle is not already installed, the Verisign Bundle EPP SDK root directory contains *gradlew* and *gradlew.bat* to build using the Gradle included in the Verisign Bundle EPP SDK. Set the PATH to include the Verisign Bundle EPP SDK root directory, or execute Gradle using a relative path (e.g., `../../gradlew <tasks>`). The Gradle tasks can be executed from the Verisign Bundle EPP SDK root directory by prefixing the task with the sub-project path "bundles:verisign", such as "`./gradlew bundles:verisign:testBundle`".

Table 1 – Verisign Bundle Gradle Tasks

Target	Distribution (src, bin, or both)	Transports Supported (EoT, EoH, EoQ)	Description
`clean`	`both`	`EoT, EoH, EoQ`	`Cleans the built files and directories`
`build`	`src`	`EoT, EoH, EoQ`	`Compiles the source files`
`distJavadoc`	`src`	`EoT, EoH, EoQ`	`Creates the HTML API documentation at the path "bundles/verisign/build/javadoc"`
`jar`	`src`	`EoT, EoH, EoQ`	`Creates the jar file (epp-verisign-bundle-{$version}.jar) at the path "builds/lib/epp". The`

			version is set on the command line with the -P option, as in "./gradlew -Pversion=test bundles:verisign:jar".
startServer	both	EoT	Starts the EoT EPP SDK Stub Server that uses epp.config.
startHttpServer	both	EoH	Starts the EoH EPP SDK Stub Server that uses epp-http.config.
startQuicServer	both	EoQ	Starts the EoQ EPP SDK Stub Server that uses epp-quic.config.
testBundle	both	EoT, EoH, EoQ	Runs all tests (codec and client-server for each transport) that uses epp.config for EoT, uses epp-http.config for EoH, and uses epp-quic for EoQ.
testClientBundle	both	EoT	Runs all client tests against a previously started EoT EPP SDK Stub Server that uses epp.config.
testChinaClient	Both	EoT	Runs the ChinaVerificationCodeTst test against a previously started EoT EPP SDK Stub Server that uses epp-china-verification.config.
testChinaClientServer	Both	EoT	Runs the ChinaVerificationCodeTst test against a started EoT EPP SDK Stub Server that uses epp-china-verification.config.
testHttpClientBundle	both	EoH	Runs all client tests against a previously started EoH EPP SDK Stub Server that uses epp-http.config.
testQuicClientBundle	both	EoQ	Runs all client tests against a previously started EoQ EPP SDK Stub Server that uses epp-quic.config.
testClientServerBundle	both	EoT	Runs all client tests against a started EoT EPP SDK Stub Server that uses epp.config.
testHttpClientServerBundle	both	EoH	Runs all client tests against a started EoH EPP SDK Stub Server that uses epp-http.config.

testQuicClientServerBundle	both	EoQ	Runs all client tests against a started EoQ EPP SDK Stub Server that uses epp-quic.config.
testCodecBundle	both	EoT, EoH, EoQ	Runs all CODEC unit tests that uses epp.config.

1.1 Running SDK Tests via Stub Server

The SDK works with JDK 11 and higher. Follow the directions below to run the suite of tests against the EPP SDK Stub Server for EoT, EoH and EoQ. Use `gradlew.bat` on Windows and `gradlew` on Unix to execute the Gradle tasks. The directions only reference `gradlew`, so replace `gradlew` with `gradlew.bat` when running on Windows.

- `gradlew bundles:verisign:testClientServerBundle`
- `gradlew bundles:verisign:testHttpClientServerBundle`
- `gradlew bundles:verisign:testQuicClientServerBundle`

When running the `testClientServerBundle` task, the following is a sample result of a successful execution.

```
BUILD SUCCESSFUL in 2m 10s
106 actionable tasks: 71 executed, 35 up-to-date
```

4.1 Changes Required to Interface with Verisign Servers

The SDK configuration must be changed to communicate with the real Verisign Servers, since the transport is SSL for the Production servers. The client mappings/extensions that are used might have to be changed. Set the properties in "Table 2 - Changes Required to Interface with Verisign Servers via SSL" in ***epp.config***.

Table 2 - Changes Required to Interface with Verisign Servers via SSL

Property	Update To	Default
EPP.MapFactories	MapFactories for products that will be provisioned. For example, if .com domains are only provisioned, set `EPP.MapFactories` to: • `com.verisign.epp.codec.domain.EPPDomainMapFactory` • `com.verisign.epp.codec.host.EPPHostMapFactory`	All supported map factories.

	Recommend use of the default map factories.	
EPP.CmdRspExtensions	Dependent command/response extensions needed by the products that will be provisioned. For example, if .cc domains are only provisioned, set `EPP.CmdRspExtensions` to: • `com.verisign.epp.codec.namestoreext.EPPNamestoreExtExtFactory` **Recommend use of the default extension factories.**	All supported extension factories
EPP.SSLKeyFileName	JSSE keystore file name that contains the CA issued certificate chain and the associated private key.	../../lib/keystore/testkeys
EPP.SSLPassPhrase	Password needed to access `EPP.SSLKeyFileName` file.	passphrase
EPP.SSLKeyPassPhrase	Password needed to access the private key defined in the `EPP.SSLKeyFileName` file. If this property is not defined, `EPP.SSLPassPhrase` will be used for accessing both the keystore and the private key.	Not Defined
EPP.SSLProtocol	SSL protocol of the configured provider	TLSv1.3
EPP.SSLKeyStore	SSL keystore file type	JKS
EPP.SSLTrustStoreFileName	The trust store is a file that contains the certificate or chain of certificates that this client trusts. If this property is not defined, than the default JRE truststore ($JAVA_HOME/lib/security/cacerts) will be used. **Recommend commenting out this property.**	../../lib/keystore/testkeys
EPP.SSLTrustStorePassPhrase	Password for accessing the trust store defined by the `EPP.SSLTrustStoreFileName` property. This property is required if `EPP.SSLTrustStoreFileName` is defined. **Recommend commenting out this property.**	Undefined
EPP.ClientSocketName	Class used to make EoT client connections. Options include:	com.verisign.epp.transport.client.EPPSSLClientSocket

	1. com.verisign.epp.transport.client.EPPPlainClientSocket – TCP 2. com.verisign.epp.transport.client.EPPSSLClientSocket - SSL 3. com.verisign.epp.transport.client.EPPSSLProxyClientSocket – SSL with Proxy Server **Set this to `com.verisign.epp.transport.client.EPPSSLClientSocket` for SSL.**	
EPP.ServerName	Set to the EoT Verisign server name or IP address. The following are possible values: 1. CLTD OTE - ote-ctldepp.verisign-grs.com 2. CTLD Production – ctldepp.verisign-grs.com 3. COMNET OTE – epp-ote.verisign-grs.com 4. COMNET Production - epp.verisign-grs.net Recommend configuring and using the session pooling feature defined in section 1.1 to interface with multiple Verisign servers with a single client.	localhost
EPP.ServerPort	Set to the Versign server port number, which should be `700`.	1700

The SDK uses JSSE in the JDK. Use the EPP.SSL properties of the SDK to configure JSSE. Please consult the JSSE documentation for details of how to construct java keystores and truststores.

4.2 Example Code to initialize the Verisign Bundle EPP SDK and Start Session

The following code can be used to initialize a session with an EPP Server.

```
   public static void main(String[] args) {

       try {
        EPPApplicationSingle.getInstance().initialize("epp.config");
}
       catch (EPPCommandException e){
        e.printStackTrace();
}
```

```
       try {

         EPPSession session = new EPPSession();
         session.setTransId("ABC-12345");
         session.setVersion("1.0");
         session.setLang("en");

         session.setClientID("myname");
         session.setPassword("mypass");

         session.initSession();

         // Invoke commands on Interface classes here…
  } // try
  catch (EPPCommandException e) {

         EPPResponse response = session.getResponse();

         // Is a server specified error?
         if ((response != null) && (!response.isSuccess()))    {
                System.out.println("Server Error : " + response);
         }
                else {
                e.printStackTrace();
                System.out.println("initSession Error : " + e);
         }

        }
    }
```

4.3 Example Code to initialize the Verisign Bundle EPP SDK and using Session Pool

The example provided in section 4.2 shows a simple method of creating a new EPP session. The recommended approach is to use a session pool to manage sessions and to borrow, return, and invalidate sessions in the pool as needed. The session pool manages idle timeouts, manages absolute timeouts, maintains the configured number of sessions, and provides for a configurable session create retry. There can be more then one session pool configured, each with a pool name, so that the client can manage pools with different settings (server info, protocol, transport, login name, login password, SSL settings, number of sessions, etc.) from a single client. Refer to section 1.1 for more information on the session pools. The example below shows initializing the SDK with initializing the session pools and borrowing / returning / invalidating a session in the pool using the “test” session pool.

```
try {
         EPPApplicationSingle.getInstance().initialize(“epp.config”);
  EPPSessionPool.getInstance().init();
}
catch (Exception e){
  e.printStackTrace();
  System.exit(1);
}
```

```
EPPSession theSession = null;
try {
      theSession = EPPSessionPool.getInstance().borrowObject("test");
      NSDomain theDomain = new NSDomain(theSession);
      theDomain.addDomainName("example.com");
      theDomain.setSubProductID(NSSubProduct.COM);
      EPPDomainCheckResp theResponse = theDomain.sendCheck();
      ….
}
catch (EPPCommandException ex) {
      if (ex.hasResponse()) {
            if (ex.getResponse().getResult().shouldCloseSession()) {
                  EPPSessionPool.getInstance().invalidateObject("test",
theSession);
                  theSession = null;
            }
      }
      else {
            EPPSessionPool.getInstance().invalidateObject("test",
theSession);
            theSession = null;
      }
}
finally {
      if (theSession !- null)
            EPPSessionPool.getInstance().returnObject(theSession);
}

// Cleanly close the session pools at the end of the program
EPPSessionPool.getInstance().close();
```

4.4 Example / Test Programs

The best examples are running programs. The Verisign Bundle EPP SDK includes a suite of client tests that are fully run against a Stub Server and that can be used as samples of using the SDK. Download the source distribution of the Verisign Bundle EPP SDK to review the source of the tests included in Table 3 - SDK Interface Test Classes.

Table 3 - SDK Interface Test Classes

Test Classes	Description
com.verisign.epp.interfaces.addlemail.EPPAddlEmailTst	Test of the EAI (Additional Email) Extension
com.verisign.epp.interfaces.EPPAllocationTokenDomainTst	Test of the Allocation Token Extension
com.verisign.epp.interfaces.EPPBalanceDomainTst	Test of the Balance Info Command
com.verisign.epp.interfaces.EPPBalanceTst	Test of sending a Balance Info Command.
com.verisign.epp.interfaces.EPPCoaDomainTst	Test of the Client Object Attribute (COA) extension. Tests include a domain create with COA, and adding, changing and removing COAs using domain updates. Also tests using the domain info command to retrieve a COA from an existing owned domain.
com.verisign.epp.interfaces.EPPContactRelaxedValidationTst	Test of using the EPPContact interface to test contact creat command and contact info response with relaxed contact validation. Relaxed contact validation loads a relaxed contact XSD (contact-1.0-relaxed.xsd) that makes many of the RFC 5733 required elements optional. This test does not do anything unless the EPP.Contact.RelaxedValidation epp.config property is set to true.
com.verisign.epp.interfaces.EPPContactTst	Test of using the EPPContact interface for all of the RFC 5733 contact commands. This test creates an individual EPP session without the SDK session pool.
com.verisign.epp.interfaces.EPPDefRegTst	Test of the Defensive Registration Mapping, specific to .NAME
com.verisign.epp.interfaces.EPPDomainTst	Test of using the EPPDomain interface for all of the RFC 5731 domain commands. This test

	creates an individual EPP session without the SDK session pool.
com.verisign.epp.interfaces.EPPEmailFwdTst	Test of the Email Forwarding Mapping, specific to .NAME
com.verisign.epp.interfaces.EPPHostTst	Test of using the EPPHost interface for all of the RFC 5732 host commands. This test creates an individual EPP session without the SDK session pool.
com.verisign.epp.interfaces.EPPHttpSessionTst	Test of doing the RFC 5730 commands (login, hello, poll, and logout) over HTTP (EoH).
com.verisign.epp.interfaces.EPPIdnDomainTst	Tests send a domain create command with the IDN language extension (EPPIdnLangTag). This test creates an individual EPP session without the SDK session pool.
com.verisign.epp.interfaces.EPPIdnTableTst	Test of the IDN Table Mapping.
com.verisign.epp.interfaces.EPPLaunchTst	Test of sending launch phase commands (check, create, info, update, and delete).
com.verisign.epp.interfaces.EPPLowBalanceDomainTst	Test of processing the Low Balance Poll Message by sending a domain create of “test.com” against the Stub Server that will then insert the Low Balance Poll Message. This test creates an individual EPP session without the SDK session pool.
com.verisign.epp.interfaces.EPPNamestoreExtDomainTst	Test of using the RFC 5731 domain commands along with the NameStore Extension (EPPNamestoreExtNamestoreExt). This test creates an individual EPP session without the SDK session pool.
com.verisign.epp.interfaces.EPPNamestoreExtHostTst	Test of using the RFC 5732 host commands along with the NameStore Extension

	(EPPNamestoreExtNamestoreExt). This test creates an individual EPP session without the SDK session pool.
com.verisign.epp.interfaces.EPPNameVerificationTst	Test if the Verification Service Provider (VSP) Mapping
com.verisign.epp.interfaces.EPPNameWatchTst	Test of the NameWatch Mapping, specific to .NAME
com.verisign.epp.interfaces.EPPOrgExtDomainTst	Test of the Organization Extension
com.verisign.epp.interfaces.EPPOrgTst	Test of the Organization Mapping
com.verisign.epp.interfaces.EPPQuicSessionTst	Test of doing the RFC 5730 commands (login, hello, poll, and logout) over QUIC (EoQ).
com.verisign.epp.interfaces.EPPRegistryTst	Test of sending Verisign Registry Mapping commands.
com.verisign.epp.interfaces.EPPRelatedDomainTst	Test of sending Related Domain Extension command (domain info with extension).
com.verisign.epp.interfaces.EPPRgpDomainTst	Test of using the Domain Registry Grace Period (RGP) extension defined in RFC 3915 to restore a domain and to retrieve RGP statuses from the Stub Server. This test creates an individual EPP session without the SDK session pool.
com.verisign.epp.interfaces.EPPSessionTst	Test of doing the RFC 5730 commands (login, hello, poll, and logout).
com.verisign.epp.interfaces.EPPSyncDomainTst	Test of using ConsoliDate extension (EPPSyncExtUpdate) to synchronize the experation date of a domain. This test creates an individual EPP session without the SDK session pool.
com.verisign.epp.interfaces.EPPVerificationCodeDomainTst	Test of the Verification Code Extension
com.verisign.epp.interfaces.EPPWhoisDomainTst	Test using the EPP Whois Info Extension with the RFC 5731

	domain info command to retrieve the additional information sent by the Stub Server. This test creates an individual EPP session without the SDK session pool.
com.verisign.epp.interfaces.idnmap.EPPIdnMapDomainTst	Test of the IDN Mapping Extension.
com.verisign.epp.interfaces.launchpolicy.v01.EPPLaunchPolicyTst	Test of the Launch Policy Extension
com.verisign.epp.interfaces.loginsec.v1_0.EPPLoginSecTst	Test of the Login Security Extension
com.verisign.epp.interfaces.loginsecpolicy.v04.EPPLoginSecPolicyTst	Test of the Login Security Policy Extension
com.verisign.epp.interfaces.registry.v02.EPPRegistryTst	Test of sending Registry Mapping commands.
com.verisign.epp.interfaces.secdnsext.(v10|v11).EPPSecDNSDomainTst	Test of using the DNSSEC Extension RFC 4310 (secDNS-1.0) and RFC 5910 (secDNS-1.1) to create, info, and update a domain with DS data. This test creates an individual EPP session without the SDK session pool.
com.verisign.epp.interfaces.secureauthinfo.v1_0.EPPSecureAuthInfoTst	Test of the Secure Authorization Info Extension
com.verisign.epp.interfaces.v1_0.EPPFeeDomainTst	Test of the Registry Fee Extension
com.verisign.epp.interfaces.v1_0.EPPMaintenanceTst	Test of the Maintenance Mapping
com.verisign.epp.interfaces.v1_0.EPPTtlTst	Test of the TTL Extension
com.verisign.epp.interfaces.validate.v02.EPPValidateTst	Test of the Validate Extension.
com.verisign.epp.namestore.interfaces.NSContactTst	Test of using NSContact for all of the contact commands. This test also utilizes the SDK session pool.
com.verisign.epp.namestore.interfaces.NSDomainTst	Test of using NSDomain for all of the domain commands. This test also utilizes the SDK session pool.

com.verisign.epp.namestore.interfaces.NSHostTst	Test of using NSHost for all of the host commands. This test also utilizes the SDK session pool.
com.verisign.epp.namestore.interfaces.NSPollTst	Test of processing each of the poll messages produced by NameStore and the COMNET by sending a domain create command for "NSPollTst.com" to the Stub Server, which will then insert all possible poll message types for consumption by NSPollTst. This test also utilizes the SDK session pool.
com.verisign.epp.pool.EPPSessionPoolTst	Test of using the EPPSessionPool for an individual session pool. It utializes the session pool to send a hello and poll command. It also tests the absolute and idle timeout features of the pool.
com.verisign.epp.pool.EPPSystemSessionPoolTst	Test using two session pools (default and "test").

5. SDK Overview

The Verisign Bundle EPP SDK provide an interface for users to easily implement client applications that use EPP as the underlying protocol. The primary goal of the SDK is the same as EPP itself, which is to be extensible. New EPP Command Mappings can be created and added to the SDK. The SDK provides the following features:

- Extensible EPP Client Interface
- EPP Session Management
- Pluggable Transport Package with TCP/IP and SSL/TLS transport implementations
- Encapsulation of XML Encoding and Decoding
- Diagnostic logging using a powerful, open logging facility
- Extensible EPP Stub Server
- Use of an XML Parser Pool with XML schema caching
- Session Pooling with support for a separate SSL configuration per Session Pool.
- Support for pipelining when using *com.verisign.epp.interfaces.EPPSession*. Pipelining Pipelining is sending multiple commands and processing the responses asynchronously.

The EPP Session Management includes the handling of the EPP Greeting, the EPP Login, the EPP Logout, the EPP Hello, and the EPP Poll commands. The default behavior is to derive the EPP Login services from the classes defined in the *EPP.MapFactories* and the optional *EPP.ProtocolExtensions* and *EPP.CmdRspExtensions* configuration parameters. These configuration parameters can be overridden by calling *EPPSession.setServices ()* and *EPPSession.addExtensions ()* in the *EPPSession* Interface. As described in Section 1.1 - **Transport**, the transport layer can be easily replaced. The XML encoding and decoding is completely encapsulated in the SDK, although the XML messages can be logged as described in Section 6.6 - **Diagnostic and Error Logging**.

1.1 SDK Directories

Once unpacked, the Verisign Bundle EPP SDK will have the following directories:

Table 4 - Verisign Bundle EPP SDK Directories

Directory	Description
Graepp-verisign-${BUILD_VER}/bundles/verisign	Main directory for the Verisign Bundle EPP SDK. A bundle is a packaging of multiple EPP SDK mappings and extensions. This directory contains the configuration files and a build script that includes the Gradle tasks defined in Table 1 – Verisign Bundle Gradle Tasks.
epp-verisign-${BUILD_VER}/bundles/verisign/doc	This directory contains bundled documentation for the Verisign Bundle EPP SDK. There are EPP Mapping documents in PDF format (.pdf) or ASCII format (.txt). These documents describe the XML schema definitions for the bundled products.
epp-verisign-${BUILD_VER}/bundles/verisign/doc /html	This directory contains the bundled interface specification in Javadoc format.
epp-verisign-${BUILD_VER}/lib	This directory contains the EPP SDK JAR files and keystores.
epp-verisign-${BUILD_VER}/lib/epp	This directory contains the bundled JAR file for the Verisign Bundle EPP SDK (epp-verisign-bundle-${BUILD_VER}.jar).

1.2 SDK Packages

The SDK consists of sub-packages under *com.verisign.epp*. Some packages are extended by sub-packages (i.e. *com.verisign.epp.codec*), and some packages are extended with new classes in the existing packages (i.e. *com.verisign.epp.interfaces*). Table 5 - Verisign Bundle EPP SDK High-Level Packages provides an overview of the high-level SDK packages.

Table 5 - Verisign Bundle EPP SDK High-Level Packages

Package	Description
com.verisign.epp.codec	EPP Encoder/Decoder package. There is one sub-package per implemented EPP specification (i.e. gen for the EPP General Specification and domain for the EPP Domain Command Mapping Specification).
com.verisign.epp.exception	General EPP SDK exception classes

com.verisign.epp.interfaces	Client interface classes including EPPApplication and EPPSession
com.verisign.epp.framework	EPP Server Framework classes used by the Stub Server
com.verisign.epp.serverstub	Stub Server classes including handlers for each of the supported EPP Command Mappings.
com.verisign.epp.util	Set of SDK utility classes including EPPEnv.
com.verisign.epp.pool	Session Pool classes

6. SDK Configuration

1.1 Configuration File

The Verisign Bundle EPP SDK configuration file is a Java properties file that is passed to *EPPApplication.initialize(String)* to initialize the SDK. It contains configuration parameters that initialize the logging facility, that specify the EPP Command Mapping classes, that initialize the XML Parser Pools, and that initialize the transport layer. Each of the parameters has accessor methods in *EPPEnv*. The property file is searched in the following ways:

1. On the file system (i.e. new File(*String*))
2. In the system ClassLoader (i.e. ClassLoader.getSystemResourceAsStream(*String*))
3. In the ClassLoader of the *Environment* class (i.e. Environment.class.getClassLoader().getResourceAsStream(*String*)).

The parameters that include "Client" and "Server" indicate two separate parameters for the Client and the Server, respectively. The Process column with a value "Client/Server" indicates that the Client is the process for the Client form of the parameter and that the Server is the process for the Server form of the parameter. The required column and the description apply to both forms of the parameter. You may optionally setup separate epp.config files for client and server, when running the stub server. The parameters containing "Server" are required in the server's epp.config; parameters containing "Client" are required in the client's epp.config.

Table 6 - SDK Configuration File Parameters shows the configuration parameters in the configuration file. The table includes each configuration parameter, a description, the process that uses the parameter (Client, Server, or Both), and whether the parameter is required. The JSSE parameters are only required if *EPP.ClientSocketName* or *EPP.ServerSocketName* use a JSSE class. **Bolded** parameters are new to this release of the SDK.

Parameter	Process	Required	Description
EPP.ClientHost	Client	No	Host name or IP Address that the client will connect from. If not defined the client host will default to the loopback address.
EPP.ClientSocketName	Client	No	Concrete client socket class. The class must implement the EPPClientCon interface and is only required for TCP or SSL. The concrete EPPClientCon class is instantiated when an EPPSession is instantiated and is closed when EPPSession.endSession() is called. The classes provided in the SDK include: com.verisign.epp.transport.client.EPPPlainClientSocket - Plain TCP/IP socket connection(s)

			com.verisign.epp.transport.client.EPPSSLClientSocket - SSL TCP/IP socket connection(s) com.verisign.epp.transport.client.EPPPlainProxyClientSocket - Plain TCP/IP socket connection(s) that connects through an Apache Proxy Server (mod_proxy). The EPP.ProxyServersLocator property must be set and the EPP.ProxyServers and EPP.ProxyServersRandomize should be set. com.verisign.epp.transport.client.EPPSSLProxyClientSocket - SSL TCP/IP socket connection(s) that connects through an Apache Proxy Server. The EPP.ProxyServersLocator property must be set and the EPP.ProxyServers and EPP.ProxyServersRandomize should be set.
EPP.CmdRspExtensions	Client	No	Space separated list of fully qualified EPP Command Extension factory class names. There is one EPP Command Response Extension Factory mapping per EPP Command Response Extensions. See the Programmer Guide for the desired EPP Command Mapping for more details
EPP.Contact.RelaxedValidation	Client/Server	No	Optional Boolean setting that loads and validates to a relaxed form of the contact XSD (contact-1.0-relaxed.xsd) that makes the <contact:name>, <contact:addr>, <contact:city>, <contact:street>, <contact:cc>, and <contact:email> elements optional. Stub Server and client-side code drive off this property to apply the relaxed validation. Relaxed contact validation only applies if the property exists and is set to true. Default is false
EPP.ConTimeOut	Client	Yes	Connection timeout in milliseconds. A setting of 0 indicates no timeout. The default setting is 50000 milliseconds (50 seconds).
EPP.FullSchemaChecking	Client/Server	No	Turns on/off strict XML schema validation. Set to true to test against the Stub Server with full XML schema validation. EPP.Validating must be set to true for the EPP.FullSchemaChecking setting to have any impact. Default is true.
EPP.HttpServerScheme	Server (EoH)	Yes for EoH	HTTP server scheme to use by server, with options including “http” or “https”.

EPP.HttpVersion	Client (EoH)	No	HTTP version to use by the client, with a default of "2" and the options: 1. "1.1" for HTTP/1.1 2. "2" for HTTP/2 3. "3" for **future** HTTP/3
EPP.LoginAdapter	Client	No	Concrete optional com.verisign.epp.interfaces.EPPLoginAdapter that can customize (adapt) the makeup of the EPP Login Command sent to the server. The LoginAdapter is called prior to sending the login command to the server in com.verisign.epp.interfaces.EPPSession. Default is com.verisign.epp.interfaces.EPPLoginSecLoginAdapter to support automatically adding the Login Security Extension to the login command when the password or new password is longer than 16 characters or the EPP.UseUserAgent property is not set to false.
EPP.MapFactories	Client	Yes	Space separated list of fully qualified EPP Command Mapping factory class names. There is one EPP Mapping Factory per EPP Command Mapping. See the Programmer Guide for the desired EPP Command Mapping for more details.
EPP.MaxPacketSize	Client/Server	No	Maximum packet size of bytes accepted to ensure that the client is not overrun with an invalid packet or a packet that exceeds the maximum size. The default is 10000 if property is not defined.
EPP.PollHandlers	Server	No	Space separated list of fully qualified EPP Poll Handler class names loaded in the Stub Server. Each EPP Command Mapping that supports EPP Poll will include an EPP Poll Handler. See the Programmer Guide for the desired EPP Command Mapping for more details.
EPP.PollMessageFilter	Server	No	Set one of the com.verisign.epp.codec.gen.EPPPollMessageFilter classes that is called from within com.verisign.epp.serverstub.GenHandler.doPoll(EPPEvent, Object) to filter the poll message responses based on the client login services. The server must not return extensions (object or command / response) that the client does not support based on the login services that are passed in the Login Command. The EPP.PollMessageFilter property is optional and if set should be set only once. Default is null (undefined)
EPP.ProtocolExtensions	Client	No	Space separated list of fully qualified EPP Protocol Extension factory class names. There is one EPP Protocol Extension Factory Mapping per EPP Protocol Extensions. See the Programmer Guide for the desired EPP Command Mapping for more details.

EPP.ProxyServers	Client	No	Defines the list of Apache Proxy Servers to connect through when the EPP.ProxyServersLocator property is set to com.verisign.epp.transport.client.EPPConfigProxyServersLocator. The format required for the property value is: (<proxy server>:<port number>)(,<proxy server>:<port number>)* <proxy server> ::= '['?<ip address> | <host name>']'? An example value of for connecting to the local Apache Server using the host name, IPv4 address, and IPv6 address is “localhost:80,127.0.0.1:80,[::1]:80”.
EPP.ProxyServersLocator	Client	No	Defines the concrete class of the com.verisign.epp.transport.client.EPPProxyServersLocator interface that returns the list of Apache Proxy Servers to connect through. This property is required if the EPP.ClientSocketName property is set to either com.verisign.epp.transport.client.EPPPlainProxyClientSocket or com.verisign.epp.transport.client.EPPSSLProxyClientSocket. The default value is com.verisign.epp.transport.client.EPPConfigProxyServersLocator to load the proxy servers from the EPP.ProxyServers property.
EPP.ProxyServersRandomize	Client	No	Defines whether or not the Apache Servers defined by the EPP.ProxyServers property or what the EPP.ProxyServersLocator class returns randomized per connection or attempted in order.
EPP.ReadTimeOut	Client	No	Read timeout in milliseconds. A setting of 0 indicates no timeout. The default setting is 50000 milliseconds (50 seconds). If the property is not defined, the value of the EPP.ConTimeOut property is used for the read timeout.
EPP.RegistryPolicyAdapters	Server	No	
EPP.SchemaCachingParserPool.size	Client/Server	No	XML schema caching parser pool. This is used for parsing XML in the client and the server. The property defines the size of the pool, which is recommended to be the number of threads used in the client or the server. Default value is 10.
EPP.SDKVersion	Client	No	Defines the version of the Verisign EPP SDK distribution for inclusion in the Login Security Extension user agent. Default is automatically set by the Verisign EPP SDK distribution.

EPP.SendReceiveLogger	Client/Server	No	Concrete com.verisign.epp.util.EPPSendReceiveLogger to use for logging sent and received packets. The default value is to use com.verisign.epp.util.EPPRawSendReceiveLogger if the EPP.SendReceiveLogger is not defined. An alternative logger is to use com.verisign.epp.namestore.util.EPPSecureSendReceiveLogger that will mask sensitive attributes like the login password and the auth info values with the word "MASKED".
EPP.ServerAssembler	Server	No	Fully qualified class name of the class the Stub Server will use to assemble EPP packets. This class must implement the com.verisign.epp.framework.EPPAssembler interface. If nothing is specified then com.verisign.epp.framework.EPPXMLAssembler is used.
EPP.ServerEventHandlers	Server	Yes	Space separated list of fully qualified EPP Event Handler class names loaded in the Stub Server. There is one EPP Event Handler per EPP Command Mapping. There is one handler required for EPP general handling, which is com.verisign.epp.serverstub.GenHandler. See the Programmer Guide for the desired EPP Command Mapping for more details.
EPP.ServerName	Both	Yes	Host name or IP Address for EoT, URL for EoH or EoQ for the client to connect to. The default setting is "localhost" for EoT, "https://localhost:8083" for EoH, and "eoq://localhost:1700" for EoQ.
EPP.ServerPort	Both	Yes	Port that the server will listen on and that the client will connect to when using EoT.
EPP.ServerSocketName	Server	Yes	Concrete server socket class used by the EoT Stub Server. The classes provided in the SDK include: com.verisign.epp.transport.server.EPPPlainServer - Plain TCP/IP socket connection(s) com.verisign.epp.transport.server.EPPSSLServer - SSL TCP/IP socket connection(s)
EPP.SessionPool.<system>.maxAbsoluteTimeout	Client	No	System specific setting of EPP.SessionPool.maxAbsoluteTimeout, where <system> is replaced with the system name (i.e., srs, ctld)
EPP.SessionPool.<system>.minAbsoluteTimeout	Client	No	System specific setting of EPP.SessionPool.minAbsoluteTimeout, where <system> is replaced with the system name (i.e., srs, ctld)
EPP.SessionPool.clientTransIdGenerator	Client	No	Fully qualified class name of client transaction identifier generator that implements the com.verisign.epp.pool.EPPClientTransIdGenerator interface. Default is null (not set)
EPP.SessionPool.poolableFactoryClassName	Client	No	Poolable factory for the EPPSession's to include in the pool. Options are based on the EPP transport used:

			1. com.verisign.epp.pool.EPPGenericSessionPoolableFactory - EoT 2. com.verisign.epp.pool.EPPHttpSessionPoolableFactory – EoH 3. com.verisign.epp.pool.EPPQuicSessionPoolableFactory - EoQ
EPP.SessionPool.<system>.absoluteTimeout	Client	No	System specific setting of EPP.SessionPool.absoluteTimeout, where <system> is replaced with the system name (i.e. srs, ctld)
EPP.SessionPool.<system>.borrowRetries	Client	No	System specific setting of EPP.SessionPool.borrowRetries, where <system> is replaced with the system name (i.e. srs, ctld)
EPP.SessionPool.<system>.clientHost	Client	No	TCP client host name. If not defined, the loopback will be used.
EPP.SessionPool.<system>.clientId	Client	No	System specific setting of EPP.SessionPool.clientId, where <system> is replaced with the system name (i.e. srs, ctld)
EPP.SessionPool.<system>.clientTransIdGenerator	Client	No	System specific setting of EPP.SessionPool.clientTransIdGenerator, where <system> is replaced with the system name (i.e. srs, ctld)
EPP.SessionPool.<system>.idleTimeout	Client	No	System specific setting of EPP.SessionPool.idleTimeout, where <system> is replaced with the system name (i.e. srs, ctld)
EPP.SessionPool.<system>.initMaxTotal	Client	No	System specific setting of EPP.SessionPool.initMaxTotal, where <system> is replaced with the system name (i.e. srs, ctld)
EPP.SessionPool.<system>.initSessionOnMake	Client	No	Initialize the EPPSession when created by with an EPP login command? Boolean value with a default value of "true".
EPP.SessionPool.<system>.maxIdle	Client	No	System specific setting of EPP.SessionPool.maxIdle, where <system> is replaced with the system name (i.e. srs, ctld)
EPP.SessionPool.<system>.maxTotal	Client	No	System specific setting of EPP.SessionPool.maxTotal, where <system> is replaced with the system name (i.e. srs, ctld)
EPP.SessionPool.<system>.maxWait	Client	No	System specific setting of EPP.SessionPool.maxWait, where <system> is replaced with the system name (i.e. srs, ctld)
EPP.SessionPool.<system>.minIdle	Client	No	System specific setting of EPP.SessionPool.minIdle, where <system> is replaced with the system name (i.e. srs, ctld)
EPP.SessionPool.<system>.password	Client	No	System specific setting of EPP.SessionPool.password, where <system> is replaced with the system name (i.e. srs, ctld)
EPP.SessionPool.<system>.poolableFactoryClassName	Client	No	System specific setting of EPP.SessionPool. poolableFactoryClassName, where <system> is replaced with the system name (i.e. srs, ctld). Options are based on the EPP transport used:

			4. com.verisign.epp.pool.EPPGenericSessionPoolableFactory - EoT 5. com.verisign.epp.pool.EPPHttpSessionPoolableFactory - EoH 6. com.verisign.epp.pool.EPPQuicSessionPoolableFactory - EoQ
EPP.SessionPool.<system>.serverName	Client	No	System specific setting of EPP.ServerName, where <system> is replaced with the system name (i.e. srs, cltd)
EPP.SessionPool.<system>.serverPort	Client	No	System specific setting of EPP.ServerPort, where <system> is replaced with the system name (i.e. srs, ctld)
EPP.SessionPool.<system>.SSLDebug	Client	No	Defines the SSL debug Java system property javax.net.debug value. The possible values include: • none – No debug • all – All debug This property only needs to be defined once for all pools, since each pool property will result in resetting the javax.net.debug system property.
EPP.SessionPool.<system>.SSLEnabledCipherSuites	Client	No	Optional space delimited list of SSL cipher suites, where <system> is replaced with the system name (i.e. srs, ctld). Examples include: • SSL_RSA_WITH_RC4_128_MD5 • SSL_RSA_WITH_RC4_128_SHA
EPP.SessionPool.<system>.SSLEnabledProtocols	Client	No	Optional space delimited list of enabled SSL protocols, where <system> is replaced with the system name (i.e. srs, ctld).
EPP.SessionPool.<system>.SSLKeyFileName	Client	No	Name of the identity KeyStore file, where <system> is replaced with the system name (i.e. srs, ctld). Required if SSLProtocol is defined for pool. Default is ../../lib/keystore/testkeys
EPP.SessionPool.<system>.SSLKeyPassPhrase	Client	No	Optional passphrase/password for the private key stored in the identity KeyStore, where <system> is replaced with the system name (i.e. srs, ctld). If undefined the pool SSLPassPhrase will be used.
EPP.SessionPool.<system>.SSLKeyStore	Client	No	Type of identity KeyStore, where <system> is replaced with the system name (i.e. srs, ctld). Required if SSLProtocol is defined for pool. Default is JKS
EPP.SessionPool.<system>.SSLPassPhrase	Client	No	Passphrase/password to access the identity KeyStore file defined by SSLKeyFileName pool property, where <system> is replaced with the system name (i.e. srs, ctld). Required if SSLProtocol is defined for pool. Default is passphrase

EPP.SessionPool.<system>.SSLProtocol	Client	No	Protocol to use for pool, where <system> is replaced with the system name (i.e. srs, ctld). If defined the pool will have its own SSL configuration. The required pool SSL properties include SSLKeyStore, SSLKeyFileName, and SSLKeyPassPhrase. Default is TLSv1
EPP.SessionPool.<system>.SSLTrustStore	Client	No	Optional Type of the Trust Store, where <system> is replaced with the system name (i.e. srs, ctld). If not defined and the pool SSLTrustStoreFileName is defined, the pool SSLKeyStore will be used for the Trust Store. Default is JKS
EPP.SessionPool.<system>.SSLTrustStoreFileName	Client	No	Pool trust store file that contains the list of Certificate Authorities that should be trusted. If not set than the pool defaults to the keystore that comes with the JDK which is: $JAVA_HOME/jre/lib/security/cacerts. It is recommended to comment out or not define this property when connecting to the NameStore or COMNET Servers.
EPP.SessionPool.<system>.SSLTrustStorePassPhrase	Client	No	Pool passphrase/password to access the Trust Store file defined by the pool SSLTrustStoreFileName property.
EPP.SessionPool.<system>.timeBetweenEvictionRunsMillis	Client	No	System specific setting of EPP.SessionPool.timeBetweenEvictionRunsMillis, where <system> is replaced with the system name (i.e. srs, ctld)
EPP.SessionPool.absoluteTimeout	Client	No	Absolute timeout of session in milliseconds of a session in the session pool. Sessions past the absolute timeout will be refreshed in the pool. The setting of the EPP.SessionPool.minAbsoluteTimeout and EPP.SessionPool.maxAbsoluteTimeout properties override this property. Default is 82800000 (23 hours)
EPP.SessionPool.borrowRetries	Client	No	Number of retries when there is a failure in borrowing a new session from the pool. This eliminiates the client having to implement its own retry loop on a call to EPPSessionPool.borrowObject() and also applies to pre-initalizing the sessions when EPP.SessionPool.initMaxTotal is true. Default is 0
EPP.SessionPool.clientId	Client	No	Client id/name used to authenticate session in the session pool. Required if using the EPPSessionPool.
EPP.SessionPool.idleTimeout	Client	No	Idle timeout of session in millisonds of a sessin in the session pool. Sessions past the idle timeout will send an EPP hello command to keep the session alive. Required if using the EPPSessionPool. Default is 480000 (8 minutes)

EPP.SessionPool.initMaxTotal	Client	No	Boolean value that will pre-initialize maxTotal sessions in the pool. Default is false
EPP.SessionPool.initSessionOnMake	Client	No	Initialize the EPPSession when created by with an EPP login command? Boolean value with a default value of "true".
EPP.SessionPool.maxAbsoluteTimeout	Client	No	Maximum absolute timeout of session in milliseconds of a session in the session pool. The absolute timeout is randomized between minAbsoluteTimeout and maxAbsoluteTimeout properties as an override for the absoluteTimeout property. Sessions past the absolute timeout will be refreshed in the pool.
EPP.SessionPool.maxIdle	Client	No	Maximum number of idle sessions in the session pool. Default is 10
EPP.SessionPool.maxTotal	Client	No	Total number of sessions for the session pool. Default is 10
EPP.SessionPool.maxWait	Client	No	The maximum number of milliseconds a client will block waiting for a session from the session pool. Default is 60000 (1 minute)
EPP.SessionPool.minAbsoluteTimeout	Client	No	Minimum absolute timeout of session in milliseconds of a session in the session pool. The absolute timeout is randomized between minAbsoluteTimeout and maxAbsoluteTimeout properties as an override for the absoluteTimeout property. Sessions past the absolute timeout will be refreshed in the pool.
EPP.SessionPool.minIdle	Client	No	Minimum number of idle sessions in the session pool. Default is 5
EPP.SessionPool.password	Client	No	Password used to authenticate session in the session pool. Required if using the EPPSessionPool.
EPP.SessionPool.systemPools	Client	No	Default the set of system session pools in a comma separated list of names (i.e. srs,namestore). The system name "default" initializes a default pool that uses the EPP.SessioinPool.<param> property along with other properties like EPP.ServerName and EPP.ServerPort. The default pool uses the EPPSessionPool methods that don't take a aSystem parameter.
EPP.SessionPool.timeBetweenEvictionRunsMillis	Client	No	Frequency in milliseconds to scan idle sessions in the session pool for timeouts. Default is 500 (1/2 second)

EPP.SSLDisableHostnameVerification	Client (EoH or EoQ)	No	Disable host name verification of the server certificate, with a default value of "false". The possible values are boolean values of "true" and "false".
EPP.SSLEnabledCipherSuites	Both	No	Enabled Cipher Suites. Space delimeted list of cipher suites. Examples include: • SSL_RSA_WITH_RC4_128_MD5 • SSL_RSA_WITH_RC4_128_SHA
EPP.SSLEnabledProtocols	Both	No	Enabled Protocols. If not defined, the default for the provider will be used. If defined, the list of enabled protocols should be provided using spaces as delimeters. Examples of protocols include: • SSL - Supports some version of SSL • SSLv2 - Supports SSL version 2 or higher • SSLv3 - Supports SSL version 3 • TLS - Supports some version of TLS • TLSv1 - Supports TLS version 1 • TLSv1.1 – Supports TLS version 1.1 • TLSv1.2 – Supports TLS version 1.2 • TLSv1.3 – Supports TLS version 1.3
EPP.SSLKeyFileName	Both	No	JSSE KeyStore file used for authentication. The SDK includes a self-signed certificate in the KeyStore "testkeys".
EPP.SSLKeyPassPhrase	Both	No	JSSE private key pass-phrase. If not set, EPP.SSLPassPhrase is used. The SDK does not use a different pass-phrase for the private key.
EPP.SSLKeyStore	Both	No	JSSE KeyStore format. The default setting is "JKS".
EPP.SSLPassPhrase	Both	No	JSSE KeyStore pass-phrase. The SDK provided KeyStore has a pass-phrase of "passphrase".
EPP.SSLProtocol	Both	Yes	JSSE Protocol used. The possible values include: TLS - Supports some version of TLS SSL - Supports some version of SSL SSLv2 - Supports SSL version 2 or higher SSLv3 - Supports SSL version 3 TLSv1 - Supports TLS version 1.0 TLSv1.1 – Supports TLS version 1.1 (Java 7 or higher) TLSv1.2 – Supports TLS version 1.2 (Java 7 or higher) TLSv1.3 – Supports TLS version 1.3 (Java 11 or higher)
EPP.SSLTrustStoreFileName	Both	No	Set this to the keystore file that contains the list of Certificate Authorities that should be trusted. If not set then

			it defaults to the keystore that comes with the JDK which is: $JAVA_HOME/jre/lib/security/cacerts It is recommended to comment out or not define this property when connecting to the NameStore or COMNET Servers.
EPP.SSLTrustStorePassPhrase	Both	No	JSSE TrustStore pass-phrase. This property is required if EPP.SSLTrustStoreFileName is defined.
EPP.Test.clientId	Client	No	Optional setting for configuring the login clientId used by the tests. This will allow the tests to target servers other than the Stub Server like OT&E. Not all tests might have been updated to utilize this property. Default is "ClientX"
EPP.Test.password	Client	No	Optional setting for configuring the login password used by the tests. This will allow the tests to target servers other than the Stub Server like OT&E. Not all tests might have been updated to utilize this property. Default is "password"
EPP.Test.stubServer	Client	No	Optional Boolean setting to specify to the tests that the target server is the Stub Server. This allows the tests to be customized to run against the Stub Server or against a real server like OT&E. Default is true
EPP.TransformerPool.size	Client/Server	No	XML transformer pool. This is used for marshalling XML in the client and the server. The property defines the size of the pool, which is recommended to be the number of threads used in the client or the server. Default value is 10.
EPP.UseEntityResolver	Client/Server	No	Use an Entity Resolver, that supports the dynamic loading of XML schemas based on the client or server including the xsi:schemaLocation attribute for an XML namespace that has not already been loaded into the XML parser. XML schemas will be pre-loaded based on the registered factories, so the recommendation is to set this property to false. The default setting is true for backward compatibility. Default is true
EPP.UseUserAgent	Client	No	Include the userAgent in the login security extension? The default is true, but it can be disabled by setting the EPP.UseUserAgent property to false. Default is true
EPP.Validating	Client/Server	No	Turns on/off XML schema validation. The default is false for clients for improved performance, but can be turned to true if response validation is important. Set to true to test against the Stub Server with XML schema validation. Default is true.

EPP.XMLSignatureParserPool.size	Client/Server	No	XML Signature parser pool. This is used for validating XML signatures in launch signed marks and signed validation codes. The property defines the size of the pool, which is recommended to be the number of threads used in the client or the server. Default value is 10.
javax.net.debug	Both	No	JSSE debug options. This is very useful for debugging SSL handshaking issues. The possible values include: • none – No debug • all – All debug This property will set the javax.net.debug System property.

Table 6 - SDK Configuration File Parameters

6.5 Libraries

The Verisign Bundle EPP SDK distributions include the library dependencies in the Gradle libs.gradle file at the root of the distribution.

6.6 Diagnostic and Error Logging

The Verisign Bundle EPP SDK uses SLF4J for the logging API and applications using the Verisign Bundle EPP SDK can auto-configure their desired backend logger. The top-level Gradle libs.gradle file includes the dependencies for Log4J 1.2 (log4j1), Log4j 2 (log4j2), and Logback (logback). The default backend logger is set to Log4J 2. The tests and the Stub Server can be launched with the desired backend logger by editing the dependencies include the top-level build.gradle file. Comment out only one of the compile dependencies that include: libs.logback, libs.log4j1, and libs.log4j2. As long as the desired set of backend logger dependent libraries and the backend logger configuration file is in the application classpath, the application should use that backend logger for the Verisign Bundle EPP SDK log messages. Refer to the provided backend logger configuration files for an example of logging with the Verisign Bundle EPP SDK.

Figure 1 - Default SDK Log4J 2 Configuration File shows the configuration supplied in the SDK for Log4J 2, which includes three appenders, LOG, PACKETFILE, and ERROR, and a set of loggers. All logs will be sent to the LOG appender, which will result in the log file epp.log. All logs with the priority (level) of WARN or above will be sent to the ERROR appender, which will result in the log file epp.err. The EPP packets will be logged to the PACKETFILE appender, which will result in the log file epp-packet.log. The default format of the logs includes the date in the format "yyyyMMdd HHmmss", the category as the fully qualified class name, the priority (DEBUG, INFO, WARN, ERROR), and the log message. The EPPSession, EPPLoginCmd, and "org.apache.commons" logs are minimized for security reasons. The root category is set with a priority of "debug", so that all SDK messages will be logged.

```
<Configuration>

  <Appenders>
    <File name="LOG" fileName="epp.log" append="true">
      <PatternLayout pattern="%d{yyyyMMdd HHmmss}  %c %-5p %m%n"/>
    </File>
    <File name="PACKETFILE" fileName="epp-packet.log" append="true">
      <PatternLayout pattern="%d{yyyyMMdd HHmmss}  %c %-5p %m%n"/>
    </File>
    <File name="ERROR" fileName="epp.err" append="true">
      <PatternLayout pattern="%d{yyyyMMdd HHmmss}  %c %-5p %m%n"/>
      <ThresholdFilter level="WARN" onMatch="ACCEPT" onMismatch="DENY"/>
    </File>
  </Appenders>

  <Loggers>
     <Logger name="com.verisign.epp.interfaces.EPPSession"
       level="error"/>
    <Logger name="com.verisign.epp.codec.gen.EPPLoginCmd"
       level="error"/>
    <Logger name="org.apache.commons" level="off"/>
    <Logger name="com.verisign.epp.util.EPPXMLStream.packet"
       level="debug">
       <AppenderRef ref="LOG"/>
      <AppenderRef ref="PACKETFILE"/>
     </Logger>
     <Root level="debug">
       <AppenderRef ref="LOG"/>
       <AppenderRef ref="ERROR"/>
     </Root>
   </Loggers>

</Configuration>
```

Figure 1 - Default SDK Log4J 2 Configuration File (log4j2.xml)

6.6.1 SDK Log Categories

The SDK Log Categories are based on the SDK fully qualified class names. All of the SDK classes are contained in the package *com.verisign.epp*. In general, any SDK errors are logged at the ERROR priority level. **Table 7 - SDK Log Categories** lists the primary categories defined in the SDK.

Category	Description
com.verisign.epp.util.EPPXMLStream	Class that handles the reading and writing of the EPP XML messages. When the "debug" priority level is enabled, the packets that are read and written will be logged.
com.verisign.epp.util.EPPSchemaCachingEntityResolver	Class that handles the loading and caching of XML schemas. The loading is done from the

Category	Description
	CLASSPATH, where the schemas need to reside in the directory “schemas”.
com.verisign.epp.transport	Package that contains the SDK transport classes. When the “debug” priority level is enabled, the trace of the primary classes will be logged.
com.verisign.epp.interfaces	Package that contains the client interface classes. Currently, these classes don’t log messages, but it is likely that logs will be added in future releases.
com.verisign.epp.codec	Package that contains the EPP encoding/decoding classes. Currently, these classes don’t log messages, but it is likely that logs will be added in future releases.
com.verisign.epp.pool	Package that contains the EPP session pool classes. Logs include the number of active sessions, idle sessions, and identifies the session being borrowed or returned from/to the session pool.

Table 7 - SDK Log Categories

6.7 Adding an EPP Command Mapping to the SDK

The SDK can be easily extended to support new EPP Command Mappings. As described in section 6.5, an EPP Command Mapping is associated with a single library. This SDK distribution bundles EPP Command Mappings, so manually adding mappings might not be required. Do the following to add an EPP Command Mapping to the SDK:

1. Add the EPP Command Mapping library (i.e. *epp-domain.jar*) to the application and Stub Server CLASSPATH. When using the standard SDK build scripts, the .jar files can be added to epp-verisign-${BUILD_VER}/lib/epp for automatic inclusion in the CLASSPATH.
2. Add EPP Command Mapping factory to the *EPP.MapFactories* configuration parameter. See the EPP Command Mapping Programmer Guide for the name of the class.
3. Add EPP Command Mapping factory to the *EPP.ProtocolExtensions* configuration parameter. See the EPP Command Mapping Programmer Guide for the name of the class.
4. Add EPP Command Mapping factory to the *EPP.CmdRspExtensions* configuration parameter. See the EPP Command Mapping Programmer Guide for the name of the class.

5. Add EPP Command Mapping handler to the *EPP.ServerEventHandlers* configuration parameter. See the EPP Command Mapping Programmer Guide for the name of the class.
6. Add EPP Command Mapping poll handler to the *EPP.PollHandlers* configuration parameter. See the EPP Command Mapping Programmer Guide for the name of the class. Only EPP Command Mappings that support the EPP Poll command will include a poll handler.

By default, the services contained in the EPP <login> and the EPP <greeting> are controlled by the classes listed In *EPP.MapFactories,EPP.ProtocolExtensions, EPP.CmdRspExtensions* and *EPP.ServerEventHandler*. The client EPP <login> services by default will be determined by finding the intersection of the services included in the EPP <greeting> and the services defined by factories referenced by the *EPP.MapFactories,EPP.ProtocolExtensions, EPP.CmdRspExtensions* properties. The client can override the services with a call to *EPPSession.setServices(String [])* or the client can override the extensions with a call to *EPPSession.addExtensions(Vector ext,Vector ext)* before calling *EPPSession.initSession()*.

7. Generic EPP Client Interfaces

The generic EPP client interface classes are contained in the *com.verisign.epp.interfaces* package and are meant to be the primary classes that a client application will use.

1.1 EPPApplication

Figure 2 - EPPApplication Class Diagram shows the *EPPApplication* classes used to initialize the SDK subsystems. *EPPApplicationSingle* is a Singleton version of *EPPApplication.* The subsystems initialized by *EPPApplication*, include:

- The Environment Settings based on the contents of the configuration file. *EPPEnv* provides an interface to the configuration information.
- The Logging Facility based on the *EPP.Log* configuration parameters. If *EPP.LogMode* is set to *CUSTOM*, than the Logging Facility will not be initialized by *EPPApplication*.
- The EPP Encoder/Decoder (CODEC) based on the *EPP.MapFactories* configuration parameter

EPPApplication.initialize() must be the first SDK method called, and it reads the configuration file passed in as an argument.

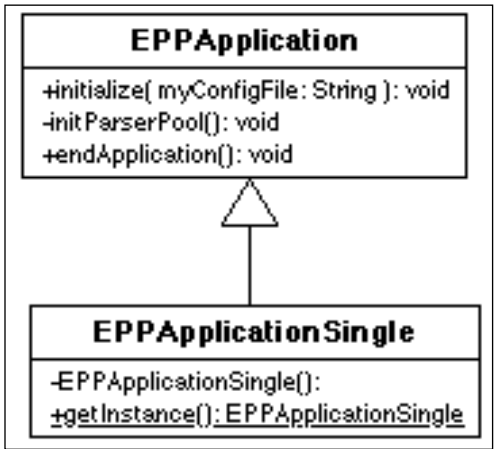


Figure 2 - EPPApplication Class Diagram

Figure 3 - EPPApplication Initialization Sample Code shows the code required to initialize *EPPApplication* with the epp.config configuration file. After *EPPApplication* is properly initialized, sessions can be created with the EPP Server as described in section 0.

```
try {
  EPPApplicationSingle.getInstance().initialize("epp.config");
}
catch (EPPCommandException e){
  System.err.println("Error initializing the EPP Application: " + e);
}
```

```
// Create one or more EPP Server sessions.
EPPSession session = new EPPSession();
```

Figure 3 - EPPApplication Initialization Sample Code

7.8 EPPSession

7.8.1 Overview

Figure 4 - EPPSession Class Diagram shows the class that is responsible for managing a session with an EPP Server. An *EPPSession* represents an authenticated connection with the EPP Server, and is passed in the constructor of the EPP Command Mapping Interface classes. For example, *EPPDomain* is created with an instance of *EPPSession*. Each *EPPSession* is associated with one *EPPClientCon*, which represents one EPP Server connection.



Figure 4 - EPPSession Class Diagram

The following is a description of the sequence in creation, usage, and closing of an *EPPSession*:

1. The client will create an instance of an *EPPSession*
2. *EPPSession* will create a connection to the EPPServer, using the concrete *EPPClientCon* defined by the *EPP.ClientSocketName* configuration parameter.

3. The client will set the authentication information (Client ID, Password) and authenticate with the EPP Server by calling *EPPSession.initSession()*. The *EPP.initSession()* will automatically intersect the configured services using the *EPP.MapFactories, EPP.ProtocolExtensions, EPP.CmdRspExtensions* configuration properties with the services included in the EPP <greeting> with setting the EPP <login> services. Optionally, the client can call *EPPSession.setServices()* with the list of client services, and also the client can optionally call *EPPSession.addExtensions()* with a vector of EPPProtocolExtensions or vector of CommandResponseExtensions or a combination of both, before calling *EPPSession.initSession()*.
4. The *EPPSession* will read the EPP <greeting> from the EPP Server, will create an EPP <login>, and will send the EPP <login> to the EPP Server.
5. The client will creates a Mapping Interface object (i.e. *EPPDomain*) with the *EPPSession* instance.
6. The client will execute zero or more commands through the Mapping Interface object.
7. The client will end the session by calling *EPPSession.endSession()*.
8. The *EPPSession* will send an EPP <logout> to the EPP Server and will call *EPPClientCon.close()* to close the connection with the EPP Server.

7.8.2 Sample Code

Figure 5 - EPPSession Life Cycle Sample Code shows the code associated with the *EPPSession* life cycle. One optional step is shown, which is setting the services to *EPPDomainMapFactory.NS* (urn:iana:xml:ns:domain-1.0) before initializing the session. The exception handlers look for an *EPPResponse* to print out the error information sent by the EPP Server. If no *EPPResponse* exists and *isSuccess()* returns *true*, than the exception is not associated with an EPP Server error.

```
// Create session and set session attributes.
EPPSession session = new EPPSession();

session.setTransId("ABC-12345-XYZ");
session.setVersion("1.0");
session.setLang("en-US");
session.setClientID("ClientX");
session.setPassword("foo-BAR2");
session.setNewPassword("bar-FOO2");

// Optional step: Override the services sent with an EPP Login, which
// by default are derived from the classes defined by
// the EPP.MapFactories configuration parameter.
// Optional step: Override the extensions sent with an EPP Login, which
// by default are derived from the classes defined by
// the EPP.ProtocolExtensions and EPP.CmdRspExtensions configuration
// Parameters.
Vector ProtocolExtensions=new Vector();
```

```
ProtocolExtensions.addElement(new String("protocolExtURI"));
Vector CommandResponseExtensions=new Vector();
CommandResponseExtensions.addElement(new String("commandExtURI"));

try {
  session.setServices(new String[]{EPPDomainMapFactory.NS});

session.addExtensions(protocolExtensions,CommandResponseExtensions);
}
catch (EPPCommandException ex) {
  System.err.println("Service " + EPPDomainMapFactory.NS + "not valid");
}

// Initialize the session
try
{
  session.initSession();
}
catch (EPPCommandException e)
{
  EPPResponse response = session.getResponse();

  // Is an EPP Server specified error?
  if ((response != null) && (!response.isSuccess()))    {
          System.err.println("initSession Server Error : " + response);

  }
  else { // Internal SDK error
          System.err.println("initSession Internal Error : " + e);
  }
}

// Create EPP Command Mapping Interface object
// See appropriate EPP Command Mapping Programmer Guide

// End the seesion
try {
  session.endSession()
}
catch (EPPCommandException e) {
  EPPResponse response = session.getResponse();

  // Is an EPP Server specified error?
  if ((response != null) && (!response.isSuccess()))    {
          System.err.println("endSession Server Error : " + response);

  }
  else { // Internal SDK error
          System.err.println("endSession Internal Error : " + e);
  }

}
```

Figure 5 - EPPSession Life Cycle Sample Code

7.8.3 initSession() Method

Initializes a session with the EPP Server.

Pre-Conditions

The following methods must be previously called:

- *setTransId(String)* – Sets the client transaction identifier
- *setClientID(String)* – Sets the client login identifier
- *setPassword(String)* – Sets the client password

The following methods can be previously called:

- *setVersion(String)* – Sets the EPP protocol version. Default is "1.0".
- setNewPassword(String) – Requests a change in password. The EPP Server might not support this. See the SDK release notes for more details.
- *setLang(String)* – Sets the desired response message language. Default is "en-US". The EPP Server might not support any language other than "en-US". See the SDK release notes for more details.
- *setServices(String [ ])* – Set the services to use with the session. The default services are derived from the classes defined by the *EPP.MapFactories* configuration parameter intersected with the EPP <greeting> services. This is useful if the client wants to explicitly define the services.
- *addExtensions(Vector,Vector)* – Set the Extensions to use with the session. The default extensions are derived from the classes defined by the *EPP.ProtocolExtensions* and the *EPP.CmdRspExtensions* configuration properties intersected with the EPP <greeting> extension services. This is useful if the client wants to explicitly define the extension services.
- *setMode(int)* – Sets the command/response processing mode to either *EPPSession.MODE_SYNC* (default) or *EPPSession.MODE_ASYNC*. *EPPSession.MODE_ASYNC* is used for pipelining where a call to a *send* method will immediately return after sending the command and the client is responsible for calling *EPPSession.readResponse() : EPPResponse* to get the response asynchronousnly.

Post-Conditions

The session with the EPP Server has been authenticated for the services set by *setServices* or derived from the classes defined in the *EPP.MapFactories* configuration parameter. The successful EPPResponse can be retrieved by calling *getResponse()*.

Exceptions

EPPCommandException that contains the *EPPResponse* returned from the EPP Server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the EPP Server response, than *getResponse()* will return *null*

.

EPP Status Codes

The following are expected EPP Status Codes when a response has been received from the EPP Server:

Constant Name	Constant Value	Description
EPPResult.SUCCESS	1000	Session has successfully been initialized. initSession will not throw an exception, and the successful response can be retrieved by calling.getResponse().
EPPResult.COMMAND_SYNTAX_ERROR	2001	Malformed EPP message.
EPPResult.COMMAND_USE_ERROR	2002	Session has already been established, which could be due to initSession being called more than once.
EPPResult.PARAM_OUT_OF_RANGE	2004	Input attribute (i.e. client identifier, password) not valid
EPPResult.COMMAND_FAILED	2500	Internal EPP Server error
EPPResult.AUTHENTICATION_ERROR	2200	Not a valid user
EPPResult.AUTHORIZATION_ERROR	2201	User is not authorized to login.
EPPResult.TIMEOUT_END	2501	Command timeout has occurred. The EPP Server closes the connection.

Table 8 - EPPSession.initSession EPP Status Code Matrix

7.8.4 endSession() Method

Ends a session initialized by *initSession()*.

Pre-Conditions

A session has been successfully initialized by *initSession()*.

The following methods must be previously called:

- *setTransId(String)* – Sets the client transaction identifier

Post-Conditions

The connection is closed with the EPP Server. The successful *EPPResponse* can be retrieved by calling *getResponse()*.

Exceptions
EPPCommandException that contains the *EPPResponse* returned from the EPP Server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the EPP Server response, than *getResponse()* will return *null*.

EPP Status Codes
The following are expected EPP Status Codes when a response has been received from the EPP Server:

Constant Name	Constant Value	Description
EPPResult. SUCCESS_END_SESSION	1500	Session has successfully been closed. endSession will not throw an exception, and the successful response can be retrieved by calling.getResponse().
EPPResult.COMMAND_SYNTAX_ERROR	2001	Malformed EPP message.
EPPResult.COMMAND_USE_ERROR	2002	Session has not been established.
EPPResult.PARAM_OUT_OF_RANGE	2004	Input attribute not valid
EPPResult.COMMAND_FAILED	2500	Internal EPP Server error
EPPResult.TIMEOUT_END	2501	Command or session timeout has occurred. The EPP Server closes the connection.

Table 9 - EPPSession.initSession EPP Status Code Matrix

7.8.5 hello() Method
Sends an EPP Hello message to get the EPP Greeting from the server. This can be done with an unauthenticated and with an authenticated session.

Pre-Conditions
None.

Post-Conditions
An *EPPGreeting* is returned.

Exceptions
EPPCommandException indicates that the *EPPGreeting* was not successfully received.

EPP Status Codes
None.

7.8.6 sendPoll() Method

Sends a poll command to either request a poll message or to send a poll message acknowledgement.

Pre-Conditions

A session has been successfully initialized by *initSession()*.

The following methods must be previously called:

- *setTransId(String)* – Sets the client transaction identifier
- *setPollOp(String)* – Sets the poll operation to either *EPPSession.OP_REQ* for requesting a poll message and *EPPSession.OP_ACK* to acknowledge a poll message.

The following methods can be previously called:

- *setMsgID(String)* – Sets the message identifier associated with a poll command where the poll operation is set to *EPPSession.OP_ACK.*

Post-Conditions
A poll message is contained in the *EPPResponse* when the poll operation is *EPPSession.OP_REQ* and the poll message is removed from the poll queue when the poll operation is *EPPSession.OP_ACK.*

Exceptions
EPPCommandException that contains the *EPPResponse* returned from the EPP Server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the EPP Server response, than *getResponse()* will return *null*.

EPP Status Codes
The following are expected EPP Status Codes when a response has been received from the EPP Server:

Constant Name	Constant Value	Description
EPPResult. SUCCESS	1000	Poll acknowledgement command was successful

EPPResult.SUCCESS_POLL_NO_MSGS	1300	Successful Poll request command. There are no messages in the queue.
EPPResult.SUCCESS_POLL_MSG	1301	Successful Poll request command. A poll and a queue size is returned.
EPPResult.COMMAND_SYNTAX_ERROR	2001	Malformed EPP message.
EPPResult.COMMAND_USE_ERROR	2002	Session has not been established.
EPPResult.PARAM_OUT_OF_RANGE	2004	Input attribute not valid
EPPResult.COMMAND_FAILED	2500	Internal EPP Server error
EPPResult.TIMEOUT_END	2501	Command or session timeout has occurred. The EPP Server closes the connection.

Table 10 - EPPSession.sendPoll EPP Status Code Matrix

7.9 EPPEnv

EPPEnv is a utility class initialized by *EPPApplication* that provides an interface for the SDK configuration parameters. *EPPEnvSingle* is the Singleton class for *EPPEnv*. **Figure 6 - EPPEnv Class Diagram** shows the class diagram for *EPPEnv* and *EPPEnvSingle*.

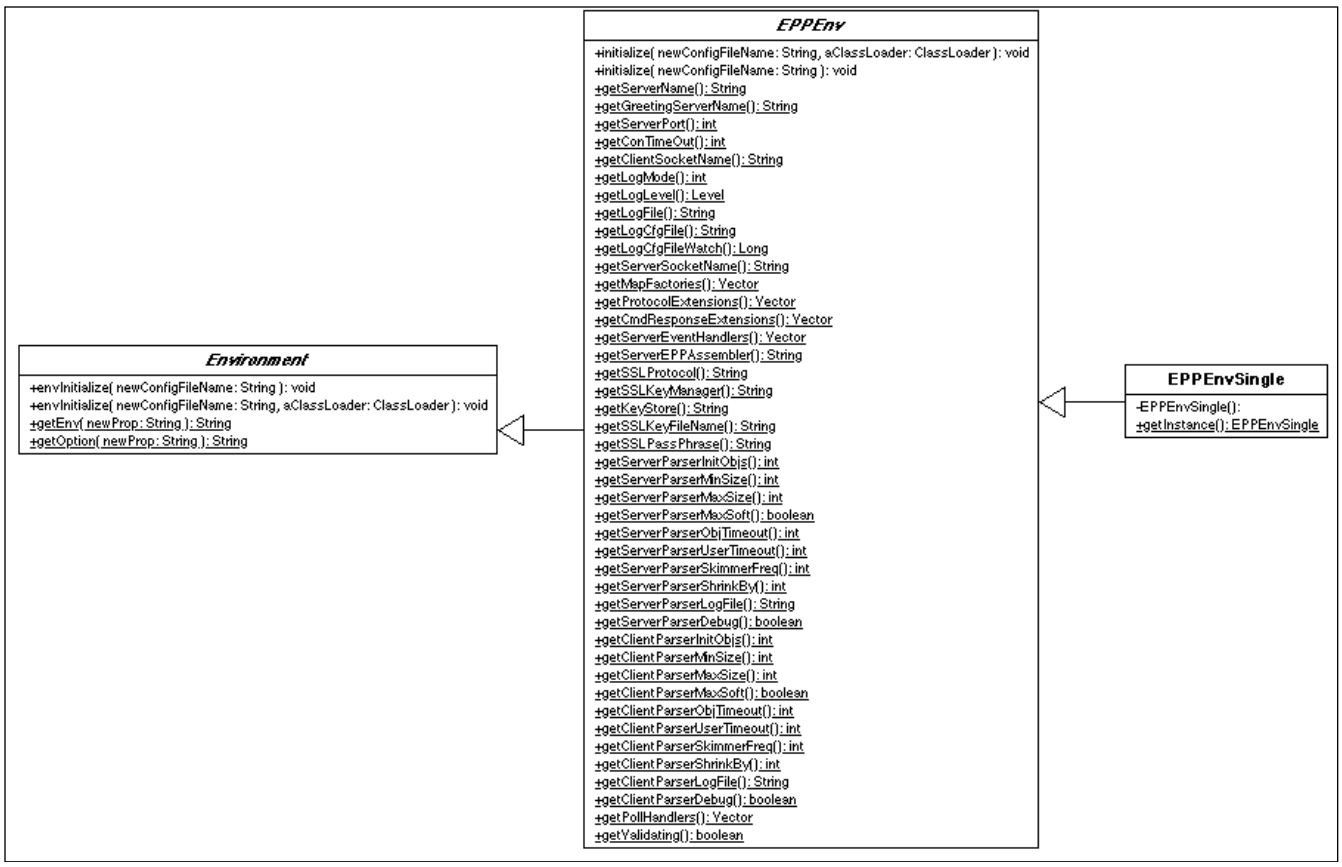


Figure 6 - EPPEnv Class Diagram

Each configuration parameter has an associated EPPEnv accessor method. Table 11 - EPPEnv Method Mappings shows the mapping of the *EPPEnv* assessor methods to the configuration parameters.

Method Name	Configuration Parameter
getClientSocketName()	EPP.ClientSocketName
getCmdResponseExtensions()	EPP.CmdRspExtensions
getConTimeOut	EPP.ConTimeOut
getFullSchemaChecking()	EPP.FullSchemaChecking
getGreetingServerName()	EPP.GreetingServerName
getKeyStore()	EPP.SSLKeyStore
getMapFactories()	EPP.MapFactories

getPollHandlers()	EPP.PollHandlers
getProtocolExtensions()	EPP.ProtocolExtensions
getProxyServerLocator()	EPP.ProxyServersLocator
getProxyServers()	EPP. ProxyServers
getProxyServersRandomize()	EPP.ProxyServersRandomize
getServerEventHandlers()	EPP.ServerEventHandlers
getServerName()	EPP.ServerName
getServerPort()	EPP.ServerPort
getServerSocketName()	EPP.ServerSocketName
getSSLEnabledCipherSuites()	EPP.SSLEnabledCipherSuites
getSSLEnabledProtocol()	EPP.SSLEnabledProtocols
getSSLKeyFileName()	EPP.SSLKeyFileName
getSSLKeyManager()	EPP.SSLKeyManager
getSSLKeyPassPhrase()	EPP.SSLKeyPassPhrase
getSSLPassPhrase()	EPP.SSLPassPhrase
getSSLPassPhrase()	EPP.SSLPassPhrase
getSSLProtocol()	EPP.SSLProtocol
getSSLTrustStoreFileName()	EPP.SSLTrustStoreFileName
getSSLTrustStorePassPhrase()	EPP.SSLTrustStorePassPhrase
getValidating()	EPP.Validating
getSchemaCachingParserPoolSize()	EPP.SchemaCachingParserPool.size
getTransformerPoolSize()	EPP.TransformerPool.size
getXMLSignatureParserPoolSize()	EPP.XMLSignatureParserPool.size

Table 11 - EPPEnv Method Mappings

8. XML Parser Pool

The XML Parser included in the SDK is XercesJ (http://xml.apache.org/xerces-j/index.html), which is not thread-safe. There are three approaches to overcoming this limitation, which include:

1. A parser per thread
2. A parser per operation
3. A parser pool

Having a parser per thread requires the SDK to have knowledge/control of the thread, which is not flexible. Instantiating a parser per operation represents a scalability issue because of the expense of instantiating and garbage collecting a parser for every operation. Utilizing a parser pool provides a more scalable solution and does not require the SDK to have knowledge/control of the thread.

Apache Common Pool 2 is used to implement the XML Parser Pool. There is an XML Parser Pool used by the SDK Client and the SDK Stub Server. The configuration property EPP.SchemaCachingParserPool.size can be used to configure the client and Stub Server. Table 6 - SDK Configuration File Parameters describes the XML Parser Pool configuration parameters. The *EPPEnv* class includes accessor methods for the configuration parameters as described in Table 11 - EPPEnv Method Mappings. There is a matching Transformer Pool that is used to marshal the XML in the client and Stub Server, which is configured with the EPP.TransformerPool.size property.

9. Extending the SDK

1.1 Transport

The SDK allows for the replacement of the transport layer with a combination of the *EPP.ServerName* and *EPP.ClientSocketName* configuration parameters. The pre-built transports in the SDK include:

- com.verisign.epp.transport.client.EPPPlainClientSocket – For TCP/IP connections
- com.verisign.epp.transport.client.EPPSSLClientSocket – For SSL/TLS connections

A transport class must implement *com.verisign.epp.transport.EPPClientCon* and have a default constructor. **Figure 7 - EPPClientCon Class Diagram** shows the class diagram for *EPPClientCon*.

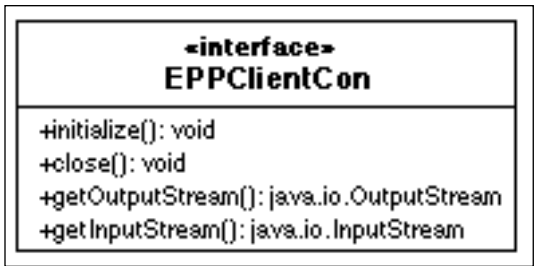


Figure 7 - EPPClientCon Class Diagram

When a new *EPPSession* is created, the *EPPSession* will create an instance of the class defined by the *EPP.ClientSocketName* configuration parameter, call the *EPPClientCon.initialize()* method, and retrieve the input/output stream by calling *EPPClientCon.getInputStream()* and *EPPClientCon getOutputStream()*. When the *EPPSession* is ended by a call to *EPPSession.endSession()*, the *EPPSession* will call *EPPClientCon.close()*.

Figure 8 - SDK TCP/IP Transport Sample Code shows the code required to implement a TCP/IP transport using the host name, port number, and connection timeout SDK configuration settings. A custom transport can be used by setting EPP.ClientSocketName with the fully qualified name of the `EPPClientCon` class and by using `EPPSession`.

```
import java.net.*;
import java.io.*;
import com.verisign.epp.transport.*;
import com.verisign.epp.util.*;

public class EPPClientConSample implements EPPClientCon {
```

```
public EPPClientConSample() throws EPPConException {
        try {
                _hostName = EPPEnv.getServerName();
                _portNum  = EPPEnv.getServerPort();
                _conTimeout = EPPEnv.getConTimeOut();
        }
        catch (EPPEnvException ex) {
                throw new EPPConException("Error initializing
                attributes: " + ex);
        }

        _socket = null;
        _input  = null;
        _output = null;
}

public void initialize() throws EPPConException {
        try {
                _socket = new Socket(_hostName, _portNum);
                _socket.setSoTimeout(_conTimeout);
        }
        catch (UnknownHostException ex) {
                throw new EPPConException("Creating socket: " + ex);
        }
        catch (IOException ex) {
                throw new EPPConException("Creating socket: " + ex);
        }
        catch (SecurityException ex) {
                throw new EPPConException("Creating socket: " + ex);
        }

        try {
                _input = _socket.getInputStream();
                _output = _socket.getOutputStream();
        }
        catch (IOException ex) {
                throw new EPPConException("Getting streams: " + ex);
        }
}

public InputStream getInputStream() throws EPPConException {
        if (_input == null) {
                throw new EPPConException("The input stream is null");
        }

        return _input;
}

public OutputStream getOutputStream() throws EPPConException {
        if (_output == null) {
                throw new EPPConException("The output stream is null");
        }

        return _output;
}

public void close() throws EPPConException {
```

```
        if (_socket != null) {

                try {
                        _socket.close();
                }
                catch (IOException ex) {
                        throw new EPPConException("Closing socket: "
                        + ex);
                }

                _socket = null;
                _input = null;
                _output = null;
        }
 }

 private InputStream    _input;
 private OutputStream   _output;
 private Socket         _socket;
 private String         _hostName;
 private int            _portNum;
 private int            _conTimeout;

} // End class EPPClientConSample
```

Figure 8 - SDK TCP/IP Transport Sample Code

10. Stub Server

The Verisign Bundle EPP SDK includes an extensible Stub Server that implements all of the installed EPP commands and returns back complete hard-coded successful EPP responses.

1.1 Event Handlers

The Stub Server uses event handlers to process and respond to the EPP commands it receives. The *EPP.ServerEventHandlers*, located in the *epp.config* file, controls what EPP commands will be supported by the Stub Server. The general EPP commands including EPP Login, EPP Logout, EPP Hello, EPP Poll, and the creation of the EPP Greeting is handled by *com.verisign.epp.serverstub.GenHandler*.

Each EPP Command Mapping will include a handler in the *com.verisign.epp.serverstub* package. For example, the EPP Domain Command Mapping has the handler *com.verisign.epp.serverstub.DomainHandler*. The handlers set in *EPP.ServerEventHandlers* will create the list of services in the EPP Greeting. For example, by adding *com.verisign.epp.serverstub.DomainHandler* to *EPP.ServerEventHandlers*, *urn:ietf:params:xml:ns:domain-1.0* will be added to the EPP Greeting service menu.

10.10 Poll Handlers

Each EPP Command Mapping that supports EPP Poll will include a handler in the *com.verisign.epp.serverstub* package. For example, the EPP Domain Command Mapping has the handler *com.verisign.epp.serverstub.DomainPollHandler*. The handlers loaded in the server are included with the *EPP.PollHandlers* configuration parameter. The Stub Server implements an in-memory poll queue, which can be used by server handlers to insert messages into the queue. See the product sections of this programmer's guide for more details about polling requirements and adding the product specific EPP Command Mappings. There is only one in-memory queue for the server, so different connections will pull messages from the same queue. See the *EPPSession.sendPoll()* for more information on sending an EPP Poll command.

11. Client Implementation Notes

1.1 Pooling

Connection pooling is a common pattern for scalable systems. *EPPSession* is associated with a single connection for its entire lifecycle. Since an *EPPSession* represents an authenticated connection with the EPP Server, it is recommended to pool *EPPSession* instances. The EPP Server does have a session timeout, so the *EPPSession* instances will have to be periodically refreshed. The *EPPSessionPool* can be used to manage a pool of sessions. Refer to the EPP.SessionPool parameters in Table 6 - SDK Configuration File Parameters for details on configuring the session pool. *EPPSessionPool.init()* will initialize the session pool assuming the SDK has already been initialized by calling *EPPApplicationSingle.initialize(config_file : String)*. *EPPSessionPool.close* will cleanly close the underlying *EPPSession* instances that should be called at the ending of the client program. Below is a sample of the block of code using the EPPSessionPool for sending a domain check:

```
EPPSession theSession = null;
try {
      theSession = EPPSessionPool.getInstance().borrowObject();
      NSDomain theDomain = new NSDomain(theSession);
      theDomain.addDomainName("example.com");
      theDomain.setSubProductID(NSSubProduct.COM);
      EPPDomainCheckResp theResponse = theDomain.sendCheck();
      ….
}
catch (EPPCommandException ex) {
      if (ex.hasResponse()) {
            if (ex.getResponse().getResult().shouldCloseSession()) {

      EPPSessionPool.getInstance().invalidateObject(theSession);
                  theSession = null;
            }
      }
      else if (theSession != null) {
            EPPSessionPool.getInstance().invalidateObject(theSession);
            theSession = null;
      }
}
finally {
```

```
      if (theSession !- null)
            EPPSessionPool.getInstance().returnObject(theSession);
}
```

11.10.1 Multiple Session Pools

Multiple session pools can be configured and used in the SDK by defining a list of system names in the EPP.SessionPool.systemPools property. The system name "default" is for backward compatible with the EPP.SessionPool.<prop>, EPP.ServerName, and EPP.ServerPort properties. The *EPPSessionPool.init()* method will attempt to initalize a pool for each system name specified in the comma separated list o system names. The *EPPSessionPool.close()* method will cleanly close the underlying *EPPSession* instances contained in the pools and should be called at the end of the client program. The properties for a system session pool follow the naming convention, EPP.SessionPool.<system>.<prop>, where <system> is the system name. The following epp.config properties define the use of the "default" system pool along with a new system pool called "test".

```
EPP.SessionPool.systemPools=default,test

EPP.SessionPool.test.clientTransIdGenerator=com.verisign.epp.pool.Clien
tTransIdGenerator
EPP.SessionPool.test.serverName=localhost
EPP.SessionPool.test.serverPort=1700
EPP.SessionPool.test.clientId=username
EPP.SessionPool.test.password=password
EPP.SessionPool.test.minAbsoluteTimeout=79200000
EPP.SessionPool.test.maxAbsoluteTimeout=82800000
EPP.SessionPool.test.idleTimeout=480000
EPP.SessionPool.test.minIdle=0
EPP.SessionPool.test.maxIdle=-1
EPP.SessionPool.test.maxTotal=10
EPP.SessionPool.test.initMaxTotal=true
EPP.SessionPool.test.borrowRetries=3
EPP.SessionPool.test.maxWait=60000
EPP.SessionPool.test.timeBetweenEvictionRunsMillis=500
```

The example below illustrates the same session pool sample using the "test" system instead of the default system.

```
EPPSession theSession = null;
try {
      theSession = EPPSessionPool.getInstance().borrowObject("test");
      NSDomain theDomain = new NSDomain(theSession);
      theDomain.addDomainName("example.com");
      theDomain.setSubProductID(NSSubProduct.COM);
      EPPDomainCheckResp theResponse = theDomain.sendCheck();
      ….
```

```
}
catch (EPPCommandException ex) {
      if (ex.hasResponse()) {
            if (ex.getResponse().getResult().shouldCloseSession()) {
                  EPPSessionPool.getInstance().invalidateObject("test",
theSession);
                  theSession = null;
            }
      }
      else if (theSession != null) {
            EPPSessionPool.getInstance().invalidateObject("test",
theSession);
            theSession = null;
      }
}
finally {
      if (theSession !- null)

      EPPSessionPool.getInstance().returnObject("test",theSession);
}
```

The example below illustrates the same session pool sample using the "default" system instead of using the equavalent default system methods of EPPSessionPool.

```
EPPSession theSession = null;
try {
      theSession =
EPPSessionPool.getInstance().borrowObject(EPPSessionPool.DEFAULT);
      NSDomain theDomain = new NSDomain(theSession);
      theDomain.addDomainName("example.com");
      theDomain.setSubProductID(NSSubProduct.COM);
      EPPDomainCheckResp theResponse = theDomain.sendCheck();
      ….
}
catch (EPPCommandException ex) {
      if (ex.hasResponse()) {
            if (ex.getResponse().getResult().shouldCloseSession()) {

      EPPSessionPool.getInstance().invalidateObject(EPPSesionPool.DEFAU
```

```
LT, theSession);
                    theSession = null;
             }
      }
      else if (theSession != null) {

      EPPSessionPool.getInstance().invalidateObject(EPPSesionPool.DEFAU
LT, theSession);
             theSession = null;
      }
}
finally {
      if (theSession !- null)

      EPPSessionPool.getInstance().returnObject(EPPSessionPool.DEFAULT,
theSession);
}
```

11.10.2 Separate SSL Configuration Per Session Pool

Section 11.10.1 defines how to use multiple session pools in the SDK. The SDK provides a set of SSL configuration properties that by default will be used across all session pools. Each session pool can define its own SSL configuration properties. All of the SSL configuration properties are available as session pool properties. Please refer to "Table 6 - SDK Configuration File Parameters" for more detail of the session pool SSL properties. The SDK includes the following files to test and demonstrate the use of separate SSL configurations per session pool:

1. `bundles/verisign/epp-client.config` – SDK configuration file containing a default SSL configuration that references "../lib/keystore/client1-identity.jks" for the identity keystore and "../lib/keystore/client-truststore.jks" for the truststore, and the "test" system session pool SSL configuration that references "../lib/keystore/client2-identity.jks" for the identity keystore and "../lib/keystore/client-truststore.jks" for the truststore. The "../lib/keystore /client-truststore.jks" truststore contains the self-signed server certificate contained in "../../lib/keystore/testkeys".
2. `bundles/verisign/epp-server.config` – SDK configuration to run the Stub Server using "../../lib/keystore/testkeys" as the identity keystore and "../../lib/keystore/server-truststore.jks" as the truststore. "../../lib/keystore/server-truststore.jks" contains the certificates for "../lib/keystore/client1-identity.jks" and "../lib/keystore/client2-identity.jks" so that both client session pools can establish a two-way SSL connection.

3. `lib/keystore/client1-identity.jks` – Identity keystore used by the first session pool ("default").
4. `lib/keystore/client2-identity.jks` – Identity keystore used by the second session pool ("test").
5. `lib/keystore /client-truststore.jks` – Truststore used by clients containing the server certificate from "lib/keystore/testkeys".
6. `lib/keystore/server-truststore.jks` – Truststore used by server containing the certificates from "lib/keystore/client1-identity.jks" and "lib/keystore/client2-identity.jks".

To run a test of using two session pools with separate SSL configurations, follow the steps below (using UNIX conventions):

1. `cd epp-verisign-${BUILD_VER}/bundles/verisign`
2. `build.sh -DEPP.ConfigFile=epp-server.config start-server`
3. In a separate Window:
   a. `cd epp-verisign-${BUILD_VER}/bundles/verisign`
   b. `build.sh -DEPP.ConfigFile=epp-client.config test-client`

11.11 Threading

EPPSession and the SDK classes that use *EPPSession* (i.e. *EPPDomain*) are not thread safe. It is recommended that each thread use its own *EPPSession* or use a session pool.

11.12 Pipelining

The *EPPSession* class supports pipelining by changing the mode from the default of *EPPSession.MODE_SYNC* to *EPPSession.MODE_ASYNC*. When the mode is set to *EPPSession.MODE_ASYNC* calling any of the *send* methods (i.e. *EPPDomain.sendCreate() : EPPDomainCreateResp*) will return *null* and the *EPPSession.readResponse() : EPPResponse* method needs to be called to asynchronously read the responses.

If Session Pooling, as described in section 1.1, is being used along with Pipelining, the mode must be set to MODE_SYNC when returning sessions back to the pool. Commands like login, logout, and hello are synchronous, so sessions in the pool must be set to MODE_SYNC. The following code shows using a session pool and sending pipelining domain check commands:

```
EPPSession theSession = null;
try {
      theSession = EPPSessionPool.getInstance().borrowObject();
```

```
      if (!theSession.isModeSupported(EPPSession.MODE_ASYNC) {
            throw new Exception("EPPSession does NOT support
MODE_ASYNC");
      }

      theSession.setMode(EPPSession.MODE_ASYNC);
      NSDomain theDomain = new NSDomain(theSession);
      // Pipeline 10 domain check commands
      for (int i = 0; i < 10; i++) {
         theDomain.addDomainName("example" + i + ".com");
         // It's good to set the client trans id for mapping responses.
         theDomain.setTransId("ASYNC-DOMAIN-CHECK-" + i);
         theDomain.setSubProductID(NSSubProduct.COM);
         // The response is null with MODE_ASYNC
         theDomain.sendCheck();
      }
      // Get the domain check responses asynchronously
      EPPDomainCheckResp theResponse;
      for (int i = 0; i < 10; i++) {
         theResponse = (EPPDomainCheckResp) theSession.readResponse();
         System.out.println("Received async domain check " + i + ": " +
theResponse);
      }
}
catch (EPPCommandException ex) {
      if (ex.hasResponse()) {
            if (ex.getResponse().getResult().shouldCloseSession()) {
               theSession.setMode(EPPSession.MODE_SYNC);

EPPSessionPool.getInstance().invalidateObject(theSession);
               theSession = null;
            }
      }
      else if (theSession != null) {
            theSession.setMode(EPPSession.MODE_SYNC);
            EPPSessionPool.getInstance().invalidateObject(theSession);
            theSession = null;
      }
```

```
}
finally {
      if (theSession != null) {
            theSession.setMode(EPPSession.MODE_SYNC);
            EPPSessionPool.getInstance().returnObject(theSession);
      }
}
```

12. Poll Messages

The servers can send different kinds EPP poll messages. “Table 12 - Poll Message System Mapping” includes all of the possible EPP poll messages with a mapping of the systems that support them.

Table 12 - Poll Message System Mapping

Poll Message	CTLD	COMNET	Description
com.verisign.epp.codec.domain.EPPDomainTransferResp	X	X	Used for transfer notifications for the domain transfer actions: request, cancelled, approved, rejected, and auto approved.
com.verisign.epp.codec.domain.EPPDomainPendActionMsg	X		Used for domain registration pending action notifications.
com.verisign.epp.codec.domain.EPPDomainPendActionMsg with com.verisign.epp.codec.launch.EPPLaunchInfData extension	X		Used to notify the result of a launch application.
com.verisign.epp.codec.contact.EPPContactTransferResp	X	X	Used for transfer notifications for the contact transfer actions: request, cancelled, approved, rejected, and auto approved.
com.verisign.epp.codec.emailFwd.EPPEmailFwdTransferResp	X		Used for transfer notifications for the email forwarding transfer actions: request, cancelled, approved, rejected, and auto approved.

com.verisign.epp.codec.defReg.EPPDefRegTransferResp	X		Used for transfer notifications for the defensive registration transfer actions: request, cancelled, approved, rejected, and auto approved.
com.verisign.epp.codec.nameWatch.EPPNameWatchTransferResp	X		Used for transfer notifications for the namewatch transfer actions: request, cancelled, approved, rejected, and auto approved.
com.verisign.epp.codec.lowbalancepoll.EPPLowBalancePollResponse	X	X	Used for account low balance notifications.
com.verisign.epp.codec.rgppoll.EPPRgpPollResponse	X	X	Used for Registry Grace Period (RGP) pending restore notifications.
com.verisign.epp.codec.domain.EPPDomainInfoResp with com.verisign.epp.codec.changepoll.EPPChangeData	X	X	Used for domain change poll messages.
com.verisign.epp.codec.host.EPPHostInfoResp with com.verisign.epp.codec.changepoll.EPPChangeData	X	X	Used for host change poll messages.

The test *com.verisign.epp.namestore.interface.NSPollTst* provides a sample of processing the some of the poll messages. The following is a portion of the *com.verisign.epp.namestore.interfaces.NSPollTst*.

```
// Transfer notification
if (theResponse instanceof EPPDomainTransferResp) {
  System.out.println("testPoll: Got transfer notification");

  EPPDomainTransferResp theMsg = (EPPDomainTransferResp) theResponse;

  String theStatus = theMsg.getTransferStatus();

  // Transfer request?
  if (theStatus.equals(EPPDomainTransferResp.TRANSFER_PENDING)) {
          System.out.println("testPoll: Got transfer request
notification");
  } // Transfer approved?
  else if
(theStatus.equals(EPPDomainTransferResp.TRANSFER_CLIENT_APPROVED)) {
          System.out.println("testPoll: Got transfer approve
notification");
  } // Transfer cancelled?
  else if
(theStatus.equals(EPPDomainTransferResp.TRANSFER_CLIENT_CANCELLED)) {
          System.out.println("testPoll: Got transfer cancelled
notification");

  } // Transfer rejected?
  else if
(theStatus.equals(EPPDomainTransferResp.TRANSFER_CLIENT_REJECTED)) {
          System.out.println("testPoll: Got transfer rejected
notification");
  } // Tranfer auto approved?
  else if
(theStatus.equals(EPPDomainTransferResp.TRANSFER_SERVER_APPROVED)) {
          System.out.println("testPoll: Got transfer auto approve
notification");
  } // Tranfer auto cancelled?
  else if
(theStatus.equals(EPPDomainTransferResp.TRANSFER_SERVER_CANCELLED)) {
          System.out.println("testPoll: Got transfer auto cancelled
notification");
  }
  else {
          System.out.println("testPoll: Unknown transfer status [" +
theStatus + "]");               }

} // low balance notification
else if (theResponse instanceof EPPLowBalancePollResponse) {
  System.out.println("testPoll: Got low balance notification");

} // RGP notification
else if (theResponse instanceof EPPRgpPollResponse) {
  System.out.println("testPoll: Got RGP notification");

} // Pending action notification
else if (theResponse instanceof
com.verisign.epp.codec.domain.EPPDomainPendActionMsg) {
  System.out.println("testPoll: Got domain pending action
notification");
} // Unknown general message
```

```
else {
  System.out.println("testPoll: Got general notification");
}
```

13. Mappings and Extensions

This section provides a description of each of the Extensbible Provisioning Protocol (EPP) Mappings and Extensions supported by the Verisign Bundle EPP SDK that includes:

1. Definition of the files (i.e. library, schema)
2. Description of the interface classes, including the pre-conditions, the post-conditions, the exceptions, the EPP status codes, and sample code of each of the action methods.

Each of the Verisign systems support a different set of mappings and extensions included in the Verisign Bundle EPP SDK. "Table 13 - Mapping and Extension System Support" shows the mappings and extensions supported by the two Verisign EPP systems (Common Top Level Domain – CTLD and COM/NET Shared Registry System - COMNET) along with a short description. The name of the Mapping and Extension corresponds to the directory name included in the source distribution.

Table 13 - Mapping and Extension System Support

Mapping / Extension	CTLD	COMNET	Description
allocationtoken			RFC 8495 – Allocation Token Extension
coa		X	Client Object Attribute Extension to allow the creation and maintenance of key/value pairs associated with Objects.
changepoll	X	X	RFC 8590 - Change Poll Extension
contact	X	X	RFC 5733 - Contact Mapping
defreg	X		Defensive Registration Mapping
domain	X	X	RFC 5731 - Domain Mapping
emailfwd	X		Email Forwarding Mapping

fee draft-brown-epp-fees-06 RFC 8748	X X		RFC 8748 – Registry Fee Extension
host	X	X	RFC 5732 - Host Mapping
idn	X	X	Extension for the International Domain Name Tag required for IDN domain creates.
launch	X		RFC 8334 - Launch Phase Extension
launchpolicy draft-gould-regext-launch-policy-00			draft-gould-regext-launch-policy IETF draft.
loginsec	X	X	RFC 8807 – Login Security Extension
Maintenance			draft-ietf-regext-epp-registry-maintenance IETF draft.
namestoreext	X	X	Namestore Extension needed to specify the target sub-product for a command.
namewatch	X		NameWatch Mapping
nsfinance	X	X	Low Balance Poll Mapping and Balance Mapping
org			RFC 8543 - Organization Mapping & RFC 8544 – Organization Extension
persreg	X		Personal Registration Extension

premiumdomain	X		Extensions to the domain check command, domain check response and domain update command to support premium features.
registry Verisign Proprietary draft-gould-carney-regext-registry-02	X	X	Registry Mapping
relateddomain		X	Related Domain Extension
rgp	X	X	RFC 3915 - Redemption Grace Period Extension
secdns	X	X	RFC 5910 - Domain Name System Security Extension to provide additional features required for the provisioning of DNS
sync	X	X	Extension to support the domain sync command defined in the ConsoliDate Mapping
verificationcode	X	X	draft-ietf-regext-verificationcode IETF Draft
whois		X	Extension to the domain info command and domain info response to specify if whois information is desired and the whois attributes,

			respectively. The whois attributes include the registrar name, the whois server name, the registrar referral URL, and the IRIS server name.

"Table 14 – Mapping and Extension Directory Standard Files" defines the standard set of files that reside in the mapping and extension directories defined in "Table 13 - Mapping and Extension System Support". The mappings and extensions can be worked on in isolation by using the files in the directories, but most of the time the Verisign bundle directory should be used, which is the bundles/verisign directory.

Table 14 – Mapping and Extension Directory Standard Files

Directory	Description
build.gradle	Gradle build file that leverages the top-level Gradle files including: settings.gradle, build.gradle, libs.gradle, and gradle.properties.
epp.config	This is a sample EPP configuration file. See section 1.1 for information on configuring the SDK.
log4j.xml	Log4J 1 XML configuration file.
log4j2.xml	Log4J 2 XML configuration file.
logback.xml	Logback XML configuration file.

"Table 15 - Mapping and Extension CODEC Packages" defines the CODEC Java packages associated with each of the mappings and extensions along with a description of how they CODEC packages are configured in the SDK.

Table 15 - Mapping and Extension CODEC Packages

Mapping / Extension	Package	Description
coa	com.verisign.epp.codec.coaext	The COA Extension Encoder/Decoder package. All of the detail of encoding and decoding the COA Extension is in this package.

		The EPPCoaExtFactory must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name.
contact	com.verisign.epp.codec.contact	The standard EPP Contact Encoder/Decoder package. All of the detail of encoding and decoding the EPP Contact messages are in this package. The EPPContactMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.
defreg	com.verisign.epp.codec.defreg	The EPP Defensive Registration Encoder/Decoder package. All the detail of encoding and decoding the EPP Defensive Registration message are in this package. The EPPDefRegMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.
domain	com.verisign.epp.codec.domain	The standard EPP Domain Encoder/Decoder package. All of the detail of encoding and decoding the EPP Domain messages are in this package. The EPPDomainMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.
emailfwd	com.verisign.epp.codec.emailfwd	The EPP Email Forwarding Encoder/Decoder package. All the detail of encoding and decoding the EPP Email Forwarding message are in this package. The EPPEmailFwdMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.
fee	com.verisign.epp.codec.fee.v09 com.verisign.epp.codec.fee.v11 com.verisign.epp.codec.fee.v23 com.verisign.epp.codec.fee.v1_0	The Registry Fee Extension Encoder/Decoder packages. All the detail of encoding and decoding the EPP Registry Fee versioned messages are in these packages. The desired set of EPPFeeExtFactory classes must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name.
host	com.verisign.epp.codec.host	The standard EPP Host Encoder/Decoder package. All of the detail of encoding and decoding the EPP Host messages are in this package.

		The EPPHostMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.
idn	com.verisign.epp.codec.idnext	The IDN Tag Extension Encoder/Decoder package. All of the detail of encoding and decoding the IDN Tag Extension is in this package. The EPPIdnExtFactory must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name.
launch	com.verisign.epp.codec.launch	The standard Launch Phase Extension Encoder/Decoder package. All of the detail of encoding and decoding the Launch Phase Extension is in this package. The EPPLaunchExtFactory must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name.
launchpolicy	com.verisign.epp.codec.launchpolicy.v01	The Launch Policy Extension Encoder/Decoder package. All of the detail of encoding and decoding the Login Security Extension is in this package. The EPPLaunchPolicyExtFactory must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name. The EPPLaunchPolicyAdapter should be added to the EPP.RegistryPolicyAdapter configuration parameter using the full package and class name when running the Stub Server.
loginsec	com.verisign.epp.codec.loginsec.v1_0	The Login Security Extension Encoder/Decoder package. All of the detail of encoding and decoding the Login Security Extension is in this package. The EPPLoginSecExtFactory must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name.
Maintenance	com.verisign.epp.codec.maintenance.v1_0	Maintenance Mapping Encoder/Decoder package. The EPPMaintenanceMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.

namestoreext	com.verisign.epp.codec.namestoreext	NamestoreExt Extension Encoder/Decoder package. All of the detail of encoding and decoding the EPP NamestoreExt messages are in this package. The EPPNamestoreExtExtFactory must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name.
namewatch	com.verisign.epp.codec.namewatch	The EPP NameWatch Encoder/Decoder package. All the detail of encoding and decoding the EPP NameWatch message are in this package. The EPPNameWatchMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.
nsfinance	com.verisign.epp.codec.balance	The EPP Balance Encoder/Decoder package. All the detail of encoding and decoding the EPP Balance message are in this package. The EPPBalanceMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.
nsfinance	com.verisign.epp.codec.lowbalancepoll	The EPP Low Balance Poll Encoder/Decoder package. All the detail of encoding and decoding the EPP Low Balance Poll message are in this package. The EPPLowBalancePollMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.
org	com.verisign.epp.codec.org	The Organization Mapping Encoder/Decoder package. All of the detail of encoding and decoding the Organization Mapping is in this package. The EPPOrgMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.
orgext	com.verisign.epp.codec.orgext	The Organization Extension Encoder/Decoder package. All of the detail of encoding and decoding the Organization Extension is in this package. The EPPOrgExtFactory must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name.
persreg	com.verisign.epp.codec.persreg	The Personal Registration Encoder/Decoder package. All of the detail of encoding and decoding the Personal Registration Extension is in this package.

		The EPPPersRegExtFactory must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name.
premiumdomain	com.verisign.epp.codec.premiumdomain	The Premium Domain Extension Encoder/Decoder package. All of the detail of encoding and decoding the Premium Domain Extension is in this package. The EPPPremiumDomainExtFactory must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name.
registry	com.verisign.epp.codec.registry com.verisign.epp.codec.registry.v01 com.verisign.epp.codec.registry.v02	The EPP Registry Encoder/Decoder package. All the detail of encoding and decoding the EPP Registry messages are in this package. The EPPRegistryMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.
relateddomain	com.verisign.epp.codec.relateddomainext	The EPP Related Domain Encoder/Decoder package. All the detail of encoding and deconding the EPP Related Domain Extension are in this package. The EPPRelatedDomainExtFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.
rgp	com.verisign.epp.codec.rgpext	The RGP Extension Encoder/Decoder package. All of the detail of encoding and decoding the RGP extension is in this package. The EPPRgpExtFactory must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name.
rgp	com.verisign.epp.codec.rgppoll	The RGP Poll Encoder/Decoder package. All of the detail of encoding and decoding the RGP poll message is in this package. The EPPRgpPollMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.

secdns	com.verisign.epp.codec.secdnsext	The SecDNS Extension Encoder/Decoder package. All of the detail of encoding and decoding the SecDNS Extension is in this package. The EPPSecDNSExtFactory must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name.
suggestion	com.verisign.epp.codec.suggestion	The EPP Name Suggestion Encoder/Decoder package. All the detail of encoding and decoding the EPP Name Suggestion message are in this package. The EPPSuggestionMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.
sync	com.verisign.epp.codec.syncext	The Sync Extension Encoder/Decoder package. All of the detail of encoding and decoding the Sync extension is in this package. The EPPSyncExtFactory must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name.
whois	com.verisign.epp.codec.whois	The Whois Extension Encoder/Decoder package. All of the detail of encoding and decoding the Whois Extension is in this package. The EPPWhoisExtFactory must be added to the EPP.CmdRspExtensions configuration parameter using the full package and class name.
whowas	com.verisign.epp.codec.whowas	The EPP WhoWas Encoder/Decoder package. All the detail of encoding and decoding the EPP WhoWas message are in this package. The EPPWhoWasMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name.

The EPP Mappings and Extensions are defined using XML schema files. These files are located in the ***schemas*** directory of *epp-verisign-bundle-{$BUILD_VER}.jar*. Extract the *epp-verisign-bundle-{$BUILD_VER}.jar* in the binary distribution to view the schema files or look to the location column defined in "Table 16 – Mapping and Extension XML

Schema Files" to view the schema files in the source distribution. The *EPPSchemaParsingEntityResolver* look for the schemas in the *schemas* folder of the classpath.

Table 16 – Mapping and Extension XML Schema Files

File Name	Location	Description
coa-1.0.xsd	coa/schemas	Client Object Attribute (COA) XML schema
contact-1.0.xsd	contact/schemas	Standard EPP Contact XML Schema.
defreg-1.0.xsd	defreg/schemas	Defensive Registration XML Schema.
domain-1.0.xsd	domain/schemas	Standard EPP Domain XML Schema.
emailfwd-1.0.xsd	emailfwd/schemas	Email Forwarding XML Schema.
fee-0.9.xsd fee-0.11.xsd fee-0.23.xsd fee-1.0.xsd	fee/schemas	Registry Fee Extension versioned XML Schema.
host-1.0.xsd	host/schemas	Standard EPP Host XML Schema.
idnLang-1.0.xsd	idn/schemas	IDN Language Tag Extension XML Schema.
loginSec-0.1.xsd loginSec-0.2.xsd	loginsec/schemas	Login Security Extension XML Schema.
launchPolicy-0.1.xsd	launchpolicy/schemas	Launch Policy Extension XML Schema.
Maintenance-1.0.xsd	Maintenance/schemas	Maintenance Mapping XML Schema.
namestoreExt-1.0.xsd	namestoreext/schemas	NamestoreExt XML Schema.
launch-1.0.xsd mark-1.0.xsd signedMark-1.0.xsd xmldsig-core-schema.xsd	launch/schemas	Launch Phase EPP Extension XML schemas.
namestoreExt-1.0.xsd	namestoreext/schemas	Namestore Extension XML Schema.

namewatch-1.0.xsd	namewatch/schemas	NameWatch XML Schema.
balance-1.0.xsd lowbalance-poll-1.0.xsd	nsfinance/schemas	Namestore Finance (Balance and Low Balance Poll) XML schemas.
org-1.0.xsd orgext-1.0.xsd	org/schemas	Organization Mapping and Extension XML Schema.
persReg-1.0.xsd	persreg/schemas	Personal Registration Extension XML Schema.
registry-0.1.xsd (IETF draft) registry-1.0.xsd (Proprietary)	registry/schemas	Registry Mapping XML Schema.
relatedDomain-1.0.xsd	relateddomain/schemas	Related Domain Extension XML Schema.
rgp-1.0.xsd rgp-poll-1.0.xsd	rgp/schemas	Standard EPP Domain Registry Grace Period Mapping XML Schema and EPP Registry Grace Period Poll Mapping XML Schema.
sync-1.0.xsd	sync/schemas	Standard EPP ConsoliDate Mapping XML Schema.
secDNS-1.0.xsd secDNS-1.1.xsd	secdns/schemas	Domain Name System Security Extension XML Schemas (1.0 for RFC 4310 and 1.1 for RFC 5910).
suggestion-1.1.xsd	suggestion/schemas	Name Suggestion XML Schema.
sync-1.0.xsd	sync/schemas	ConsoliDate (Sync) XML Schema.
whoisInf-1.0.xsd	whois/schemas	Whois Info Extension XML Schema.
whowas-1.0.xsd	whowas/schemas	WhoWas XML Schema.

13.13 Namestore Client Interfaces

The Client Interfaces package *com.verisign.epp.namestore.interfaces* consists of a set of high-level client interface classes for setting the properties of commands and sending those commands to an EPP server using an established EPP Session. Generally, there is one Client Interface class per supported EPP mapping and a set of support classes for attaching extensions to the commands. A set of higher-level utility Client Interface classes and support classes have been defined to make setting of the extensions easier, which include:

- *com.verisign.epp.namestore.interfaces.NSDomain* – Extension of the *com.verisign.epp.namestore.interfaces.EPPDomain* Client Interface that adds methods for RGP (restore request and restore report), sync, DNSSEC, Namestore Extension, and the Whois Info Extension. This interface is defined in section 13.14.1.
- *com.verisign.epp.namestore.interfaces.NSHost* – Extension of the *com.verisign.epp.namestore.interfaces.EPPHost* Client Interface that adds a method for the Namestore Extension. This interface is defined in section 13.14.2.
- *com.verisign.epp.namestore.interfaces.NSContact* - Extension of the *com.verisign.epp.namestore.interfaces.EPPContact* Client Interface that adds a method for the Namestore Extension. This interface is defined in section 13.14.3.

13.14 Mappings

13.14.1 Domain Mapping (NSDomain Interface)

The Domain Mapping is first handled by the *com.verisign.epp.interfaces.EPPDomain* interface class, which is extended by the *com.verisign.epp.namestore.interfaces.NSDomain* interface to add support for common extensions. Convenience methods are provided in *NSDomain* to make managing domains easier. For example, the method *setSubProductID* is provided instead of having to manually add the *EPPNamestoreExtNamestoreExt* with each action.

The *NSDomain* interface has the following relevant methods:

Return Value	Parameters
	`NSDomain(EPPSession aNewSession)` This is the constructor method and it requires an EPP session object to be passed that has been authenticated (e.g. logged in).
`void`	`addDomainName(java.lang.String)` This method adds a domain name to the object for use with the action methods.
`void`	`addExtension(EPPCodecComponent)` Adds a extension to be sent with the command.
`void`	`addHostName(java.lang.String)` Adds a host name to be associated with the domain.
`void`	`addContact(String, String)` Adds contact for call to sendCreate() or sendUpdate().
`EPPResponse`	`getResponse()` This method returns the EPP Response for the last executed command on the interface.
`Date`	`getExpirationDate()` Returns the expiration date of the domain.
`Vector`	`getExtensions()` Gets all set command extensions.
`Boolean`	`hasExtension(Class)` Does a command extension exist with the specified Class.
`EPPResponse`	`sendCheck()` This method sends the domain check command to the server.
`EPPResponse`	`sendCreate()` This method sends the domain create command to the server.
`EPPResponse`	`sendDelete()` This method sends the domain delete command to the server.
`EPPResponse`	`sendInfo()` This method sends the domain info command to the server.
`EPPResponse`	`sendUpdate()` This method sends the domain update command to the server.

EPPResponse	sendRenew() This method sends the domain renewal command to the server.
EPPResponse	sendTransfer() This method sends the domain transfer command to the server.
EPPResponse	sendRestoreRequest() This method sends the Registry Grace Period (RGP) restore request command.
EPPResponse	sendRestoreReport() This method sends the Registry Grace Period (RGP) restore report command.
EPPResponse	sendSync() This method sends the ConsoliDate sync command.
void	setTransferOpCode(java.lang.String) Sets the operation type for future transfer commands. Valid values are "TRANSFER_REQUEST", "TRANSFER_APPROVE" or "TRANSFER_REJECT"
void	setTransId(java.lang.String) This methods sets the client transaction identifier.
void	setDay(int) Sets the target day for a call to sendSync.
void	setMonth(int) Sets the target month using the Calendar month constants (Calendar.JANUARY to Calendar.DECEMBER) for a call to sendSync.
void	setIDNLangTag(String) Sets the IDN language tag for a call to sendCreate() of an IDN domain.
void	setSubProductID(String) Sets the NameStore sub-product id associated with the action method. The NSSubProduct class includes a set of constant that can be used as the setSubProductID argument value.
void	setPeriodLength(int) Sets the registration period for a create, renew, or transfer command. The default value is 1 year.
void	setPeriodUnit(String) Sets the unit of the registration period as defined by setPeriodLength(int) according to the EPP specification. The servers currently only support the default value of "y" for years.
void	setExpirationDate(Date) Sets the current expiration date for a call to sendRenew().
void	setUpdateAttrib(…) Sets attribute to update for a call to sendUpdate().
void	setAuthString(String) Sets authorization string for a call to sendCreate() , sendTransfer(), or sendInfo()
void	setRegistrant(String) Sets the domain registrant for a call to sendCreate() or sendUpdate().

void	`setHosts(String)` Sets the desired level of host information using one of the HOSTS_ constant values for a call to sendInfo(). The possible values include: HOSTS_ALL – Get information on all hosts (delegated and subordinate). This is the default value. HOSTS_DELEGATED – Get information on just the delegated hosts. HOSTS_SUBORDINATE – Get information on just the subordinate hosts.
void	`setWhoisInfo(boolean)` Sets the flag that determines if the whois info extension should be included in the response to sendInfo(). The target server needs to support the "Extensible Provisioning Protocol Extension Mapping: Whois Info" to set this flag.
void	`setSecDNSCreate(List<EPPSecDNSExtDsData>)` Sets the list of <`EPPSecDNSExtDsData` > instances in order to create delegation signer information.
void	`setSecDNSUpdateForAdd(List<EPPSecDNSExtDsData>, boolean)` Sets the list of <`EPPSecDNSExtDsData` > instances in order to add delegation signer information. It also supports setting of an urgent attribute in the SecDNS update extension which determines the priority of the request.
void	`setSecDNSUpdateForChg(List<EPPSecDNSExtDsData>, boolean)` Sets the list of <`EPPSecDNSExtDsData` > instances in order to change delegation signer information. It also supports setting of an urgent attribute in the SecDNS update extension which determines the priority of the request.
void	`setSecDNSUpdateForRem(List<Integer>, boolean)` Sets the list of <Integer> instances (i.e keytags of DS records) in order to remove delegation signer information. It also supports setting of an urgent attribute in the SecDNS update extension which determines the priority of the request.
void	`setCoaCreate(List<EPPCoaExtAttr>)` Sets the list of `<EPPCoaExtAttr>` instances (which in turn each specify a single key/value pair) to be associated with the object being created.
void	`setCoaUpdateForPut(List<EPPCoaExtAttr>)` Sets the list of `<EPPCoaExtAttr>` instances (which in turn each specify a single key/value pair) to be associated with the object being updated. If the object already has a value associated with the key, this value will be overwritten with the value specified.
void	`setCoaUpdateForRem(List<EPPCoaExtKey>)` Sets the list of `<EPPCoaExtKey>` instances specifying the key portions of existing key/value pairs to be removed from the object being updated.
void	`addOrgId(EPPOrgExtId)` Adds an org identifier with role for use with `sendCreate()`.

Void	addUpdateOrgId(int, EPPOrgExtId) Adds an org identifier with role for use with `sendUpdate()`.

Action methods are prefixed with *send* and are shown in bold in the previous table. Each action method has a different set of pre-conditions defining what attributes need to be set with the setter methods. Each action method will return a response from the server and will throw an exception if any error occurs. If the exception is associated with an error response from the server, then the response can be retrieved from the exception with a call to *getResponse()*. The following sections describe and provide sample code for the action methods.

13.14.1.1 NSDomain() method

The *NSDomain* constructor requires that an authenticated *EPPSession* object be passed upon creation. Once created, the *NSDomain* object can perform multiple functions without re-initializing the *EPPSession* object. For example, you can use the same initialized *NSDomain* object to create and info a domain with the *sendCreate()* and *sendInfo()* commands.

13.14.1.1.1 Pre-Conditions

An authenticated session has been successfully established with an *EPPSession*.

13.14.1.1.2 Post-Conditions

The *NSDomain* instance is ready for the execution of one or more operations.

13.14.1.1.3 Exceptions

None

13.14.1.1.4 Sample Code

The following example shows the steps of initializing an *EPPSession*, then using the *EPPSession* to initialize the *NSDomain* interface.

```
EPPSession session = new EPPSession();

// optional
session.setTransId("ABC-12345-XYZ");
session.setVersion("1.0");
session.setLang("en");

// required
session.setClientID("ClientXID");
session.setPassword("ClientXPass");

try {
  session.initSession();
}
catch (EPPCommandException ex) {
  ex.printStackTrace();
  System.exit(1);
}
```

```
NSDomain domain = new NSDomain(session);
```

13.14.1.2 sendCheck() method

The *sendCheck()* method sends the EPP check domain command to check the allowable flag for one or more domains.

13.14.1.2.1 Pre-Conditions

The following list shows the accessor methods for the required attributes:

- addDomainName(String) – add a domain name to the object in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.

The following list shows the the accessor methods for the optional attributes:

- addExtension(EPPCodecComponent) - Sets the extension, if any (Ex. EPPPremiumDomainCheck for Premium Domain extension)

13.14.1.2.2 Post-Conditions

On success, an *EPPDomainCheckResp* is returned, with the following attributes:

- Results – the check results are returned in a vector containing one or more *EPPDomainCheckResult* objects.

On success, an EPPDomainCheckResp is returned, with the following optional attributes based on authorization level and command attributes set:

- com.verisign.epp.codec.premiumdomain.EPPPremiumDomainCheckResp extension containing premium information. This is available via the getExtension(Class) method.

13.14.1.2.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the server response, then *getResponse()* will return *null*.

13.14.1.2.4 Sample Code

The following example shows the steps of performing a check on domains through the use of the *NSDomain* client interface and the *sendCheck()* method:

```
try {
  // Check single domain name
  domain.setTransId("ABC-12345-XYZ");
  domain.addDomainName("mydomain.tv");
  domain.setSubProductID(NSSubProduct.TV);

  // optionally set the premium extension
  EPPPremiumDomainCheck extension = new EPPPremiumDomainCheck( true );
  domain.addExtension( extension );

  response = domain.sendCheck();

  // Correct number of results?
  Assert.assertEquals(1, response.getCheckResults().size());

  // For each result
  for (int i = 0; i < response.getCheckResults().size(); i++) {
         EPPDomainCheckResult currResult = (EPPDomainCheckResult)
                response.getCheckResults().elementAt(i);

         if (currResult.isAvailable()) {
                System.out.println("domainCheck: Domain " +
                       currResult.getName() + " is available");
         } else {
                System.out.println("domainCheck: Domain " +
                       currResult.getName() + " is not available");
         }
  }

  if (response.hasExtension(EPPPremiumDomainCheckResp.class)) {
         EPPPremiumDomainCheckResp resp =
                (EPPPremiumDomainCheckResp)
          response.getExtension(EPPPremiumDomainCheckResp.class);

     // For each result
     for (int i = 0; i < resp.getCheckResults().size(); i++) {
         EPPPremiumDomainCheckResult currResult =
          (EPPPremiumDomainCheckResult) resp
                       .getCheckResults().elementAt(i);

         if (currResult.isPremium()) {
                System.out.println("domainCheck: Domain "
                       + currResult.getName() + " is premium");
                if(currResult.getPrice() != null) {
                       System.out.println("domainCheck: Premium price
                                is $" + currResult.getPrice());
                       System.out.println("domainCheck: Premium
                                renewal price is $" +
                                       currResult.getRenewalPrice());
                }
         }
         else {
                System.out.println("domainCheck: Domain "
                       + currResult.getName() + " is not premium");
         }
     }
  }
```

```
} // end of try block
catch (EPPCommandException cmdException) {

  // do something to handle the exception
  handleException(cmdException);

} // end of catch block
```

13.14.1.3 sendCreate() method

The *sendCreate()* method sends the EPP create domain command to the server.

13.14.1.3.1 Pre-Conditions

This method requires that several attributes be set prior to execution. The following list shows the accessor methods for the required attributes:

- addDomainName(String) – add the domain name to the object in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.

The following list shows the the accessor methods for the optional attributes:

- setPeriodLength(int) – Registration period for the domain create command. The default value is 1 year. Valid values are from 1 to 10.
- setIDNLangTag(String) – Language tag associated with IDN domain create command. This is required if an IDN domain name is specified.
- setSecDNSCreate(List<*EPPSecDNSExtDsData*>) – Sets the list of <*EPPSecDNSExtDsData*> instances in order to create delegation signer (DS) information.
- setCoaCreate(List<*EPPCoaExtAttr*>) - Sets the list of <*EPPCoaExtAttr*> instances (which in turn each specify a single key/value pair) to be associated with the object being created.

13.14.1.3.2 Post-Conditions

On success, an *EPPDomainCreateResp* is returned, with the following attributes:

- Name – the name of the domain being created.
- CreationDate – the date that the domain was created.
- ExpirationDate – the date that the domain is due to be renewed.

13.14.1.3.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the server response, then *getResponse()* will return *null*.

13.14.1.3.4 Sample Code

The following example shows the steps of performing a create of a domain through the use of the *NSDomain* client interface and the *sendCreate()* method:

```
try {

  domain.setTransId("ABC-12345-XYZ");

  domain.addDomainName("example.tv");
  domain.setSubProductID(NSSubProduct.TV);
  domain.addHostName1("a.b.com");
  domain.addHostName2("c.d.com");
  domain.setPeriodUnit(2);

        // -- Add Delegation Signer Information
  // instantiate a secDNS:keyData object
  EPPSecDNSExtKeyData keyData = new EPPSecDNSExtKeyData();
  keyData.setFlags( EPPSecDNSExtKeyData.FLAGS_ZONE_KEY_SEP );
  keyData.setProtocol( EPPSecDNSExtKeyData.DEFAULT_PROTOCOL );
  keyData.setAlg( EPPSecDNSAlgorithm.RSASHA1 );
  keyData.setPubKey( "AQPmsXk3Q1ngNSzsH1lrX63mRIhtwkkK+5Zj"
                + "vxykBCV1NYne83+8RXkBElGb/YJ1n4TacMUs"
                + "poZap7caJj7MdOaADKmzB2ci0vwpubNyW0t2"
                + "AnaQqpy1ce+07Y8RkbTC6xCeEw1UQZ73PzIO"
                + "OvJDdjwPxWaO9F7zSxnGpGt0WtuItQ==" );

  // instantiate another secDNS:keyData object
  EPPSecDNSExtKeyData keyData2 = new EPPSecDNSExtKeyData(
                EPPSecDNSExtKeyData.FLAGS_ZONE_KEY_SEP,
                EPPSecDNSExtKeyData.DEFAULT_PROTOCOL,
                EPPSecDNSAlgorithm.RSASHA1,
                "AQOxXpFbRp7+zPBoTt6zL7Af0aEKzpS4JbVB"
                + "5ofk5E5HpXuUmU+Hnt9hm2kMph6LZdEEL142"
                + "nq0HrgiETFCsN/YM4Zn+meRkELLpCG93Cu/H"
                + "hwvxfaZenUAAA6Vb9FwXQ1EMYRW05K/gh2Ge"
                + "w5Sk/0o6Ev7DKG2YiDJYA17QsaZtFw==" );

  // instantiate a secDNS:dsData object
  EPPSecDNSExtDsData dsData = new EPPSecDNSExtDsData();
  dsData.setKeyTag( 34095 );
  dsData.setAlg( EPPSecDNSAlgorithm.RSASHA1 );
  dsData.setDigestType( EPPSecDNSExtDsData.SHA1_DIGEST_TYPE );
  dsData.setDigest( "6BD4FFFF11566D6E6A5BA44ED0018797564AA289" );
  dsData.setMaxSigLife( 604800 );
  dsData.setKeyData( keyData );

  // instantiate another secDNS:dsData object
  EPPSecDNSExtDsData dsData2 = new EPPSecDNSExtDsData( 10563,
                        EPPSecDNSAlgorithm.RSASHA1,
                        EPPSecDNSExtDsData.SHA1_DIGEST_TYPE,
                        "9C20674BFF957211D129B0DFE9410AF753559D4B",
                        604800, keyData2 );

  // dsData Records
  List dsDataRecords = new ArrayList();
  dsDataRecords.add( dsData );
  dsDataRecords.add( dsData2 );

        // Call only if server supports creating delegation signer
        // information
```

```
  theDomain.setSecDNSCreate( dsDataRecords );

  response = (EPPDomainCreateResp) domain.sendCreate();

  //-- Output response attributes using accessors
  System.out.println("domainCreate: name = " +
         response.getName());

  System.out.println("domainCreate: CreationDate = " +
         response.getCreationDate());

  System.out.println("domainCreate: ExpirationDate = " +
         response.getExpirationDate());


} // end of try block
catch (EPPCommandException cmdException) {

  // do something to handle the exception
  handleException(cmdException);

} // end of catch block
```

13.14.1.4 sendDelete() method

The *sendDelete()* method sends the EPP delete domain command to the server.

13.14.1.4.1 Pre-Conditions

This method expects that the domain object be populated with the unique identifier of the domain to be deleted. The following method must be called to populate the domain identifier:

- addDomainName(String) – call the add domain name method passing the unique domain name in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.

13.14.1.4.2 Post-Conditions

On success, an *EPPResponse* is returned, with no attributes.

13.14.1.4.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the

exception is thrown before reading the server response, then *getResponse()* will return *null*.

13.14.1.4.4 Sample Code

The following example shows the steps of performing a delete of an CTLD domain through the use of the *NSDomain* client interface and the *sendDelete()* method:

```
try {

  domain.setTransId("ABC-12345-XYZ");
  domain.addDomainName("abcdefdg.tv");
  domain.setSubProductID(NSSubProduct.TV);

  response = (EPPResponse) domain.sendDelete();

} // end of try block
catch (EPPCommandException cmdException) {

  // do something to handle the exception
  handleException(cmdException);

} // end of catch block
```

13.14.1.5 sendInfo() method

The *sendInfo()* method sends the EPP info domain command to the server.

13.14.1.5.1 Pre-Conditions

This method expects that the domain object be populated with the single domain name of the domain to be queried. The following method must be called to populate the domain identifier:

- addDomainName(String) – call the add domain name method passing the unique domain name in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.

The following list shows the the accessor methods for the optional attributes:

- setAuthString(String) – sets the authorization string for getting full domain information if not sponsoring Registrar.
- setHosts(String) – Sets the desired level of host information. Use one of the *HOSTS_* constant values:

HOSTS_ALL – Get information on all hosts (delegated and subordinate). This is the default value.
HOSTS_DELEGATED – Get information on just the delegated hosts.
HOSTS_SUBORDINATE – Get information on just the subordinate hosts.

- setWhoisInfo(boolean) – Sets the flag for the desire for the whois information defined in the *com.verisign.epp.codec.whois.EPPWhoisInfData* class.

13.14.1.5.2 Post-Conditions

On success, an *EPPDomainInfoResp* is returned, with the following required attributes:

- name – the fully qualified domain name
- roid – the domain roid
- clientId – identifier of sponsoring client

On success, an *EPPDomainInfoResp* is returned, with the following optional attributes based on authorization level and command attributes set:

- expirationDate - date and time identifying the end of the domain's registration period
- createdBy – identifier of the client that created the domain
- createdDate - date and time of domain creation
- lastUpdatedBy - identifier of the client that last updated the domain
- lastUpdatedDate - date and time of the most recent domain modification
- lastTransferDate - date and time of the most recent successful transfer
- authInfo - authorization information
- hosts - names of host objects
- nses - names of name server objects
- status - one or more current status descriptors
- *com.verisign.epp.codec.whois.EPPWhoisInfData* extension contains the additional whois information. This is available via the *getExtension(Class)* method and will only be set if the *EPPWhoisInf* command extension was included with a flag value of *true*, which is authomatically set using the *setWhoisInfo(boolean)* method.
- *com.verisign.epp.codec.secdnsext.EPPSecDNSExtInfData* extension contains the Delegation Signer (DS) information. This is available via the *getExtension(Class)* method.

- *com.verisign.epp.codec.coaext.EPPCoaExtInfData* extension contains the Client Object Attribute (COA) information. This is available via the *getExtension(Class)* method.

13.14.1.5.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the server response, then *getResponse()* will return *null*.

13.14.1.5.4 Sample Code

The following example shows the steps of querying an CTLD domain through the use of the *NSDomain* client interface and the *sendInfo()* method:

```
try {

  domain.setTransId("ABC-12345-XYZ");
  domain.addDomainName("abcdefg.tv");
  domain.setSubProductID(NSSubProduct.TV);
  domain.setHosts(EPPDomain.HOSTS_ALL);
  domain.setWhoisInfo(true); // Call only if server supports it

  response = (EPPDomainInfoResp) domain.sendInfo();

  //-- Output required response attributes using accessors
  System.out.println("domainInfo: name            = " +
         response.getName());
  System.out.println("domainInfo: created by      = " +
         response.getCreatedBy());
  System.out.println("domainInfo: expiration date = " +
         response.getExpirationDate());

  //-- Output additional whois information if returned
  if (response.hasExtension(EPPWhoisInfData.class) {
         EPPWhoisInfData whois = (EPPWhoisInfData)
                response.getExtension(EPPWhoisInfData.class);
         System.out.println("domainInfo: registrar = " +
                whois.getRegistrar());
         System.out.println("domainInfo: whois server = " +
                whois.getWhoisServer());
  }

       //-- Output the secDNS:infData extension if returned
       if (response.hasExtension(EPPSecDNSExtInfData.class)) {
          EPPSecDNSExtInfData infData =(EPPSecDNSExtInfData)
                response.getExtension(EPPSecDNSExtInfData.class);

          Collection dsDataVec = infData.getDsData();
          EPPSecDNSExtDsData dsData = null;
          if (dsDataVec == null) {
                System.out.println("domainInfo: secDNS:infData
                             dsDataVec = " + dsDataVec);
          }
          else {
                int i = 0;
                Iterator iter = dsDataVec.iterator();
                while (iter.hasNext()) {
                       dsData = (EPPSecDNSExtDsData)iter.next();

                       System.out.println("domainInfo:
                              secDNS:infData/dsData[" + i + "]/keyTag
                              = "  + dsData.getKeyTag());
                       System.out.println("domainInfo:
                              secDNS:infData/dsData[" + i + "]/alg =
                              " + dsData.getAlg());
                       System.out.println("domainInfo:
                              secDNS:infData/dsData[" + i +
                              "]/digestType = " +
                              dsData.getDigestType());
                       System.out.println("domainInfo:
                              secDNS:infData/dsData[" + i + "]/digest
```

```
                                = "  + dsData.getDigest());
                        System.out.println("domainInfo:
                                secDNS:infData/dsData[" + i +
                                "]/maxSigLife = "  +
                                dsData.getMaxSigLife());

                        EPPSecDNSExtKeyData keyData =
                                dsData.getKeyData();
                        if (keyData == null) {
                                System.out.println("domainInfo:
                                        secDNS:infData/dsData[" + i +
                                        "]/keyData = "  + keyData);
                        }
                        else {
                                System.out.println("domainInfo:
                                        secDNS:infData/dsData[" + i +
                                        "]/keyData/flags = "
                                        + keyData.getFlags());
                                System.out.println("domainInfo:
                                        secDNS:infData/dsData[" + i +
                                        "]/keyData/protocol = "
                                        + keyData.getProtocol());
                                System.out.println("domainInfo:
                                        secDNS:infData/dsData[" + i +
                                        "]/keyData/alg = "
                                        + keyData.getAlg());
                                System.out.println("domainInfo:
                                        secDNS:infData/dsData[" + i +
                                        "]/keyData/pubKey = "
                                        + keyData.getPubKey());
                        }

                        i++;

                } // end while
          }

        }
} // end of try block
catch (EPPCommandException cmdException) {

  // do something to handle the exception
  handleException(cmdException);

} // end of catch block
```

13.14.1.6 sendUpdate() method

The *sendUpdate()* method sends the EPP update domain command to the server.

13.14.1.6.1 Pre-Conditions

This method expects that the domain object be populated with the unique identifier of the domain to be updated and the attributes to change. The following methods must be called to populate the domain name:

- addDomainName(String) – call the add domain name method passing the unique domain name in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.

The following list shows the the accessor methods for the optional attributes:

- setSecDNSUpdateForAdd(List<*EPPSecDNSExtDsData*>, `boolean`) – Sets the list of <*EPPSecDNSExtDsData*> instances in order to add delegation signer information. It also supports setting of an *urgent* attribute in the SecDNS update extension which determines the priority of the request.
- setSecDNSUpdateForChg(List<*EPPSecDNSExtDsData*>, `boolean`) – Sets the list of <*EPPSecDNSExtDsData*> instances in order to change delegation signer information. It also supports setting of an *urgent* attribute in the SecDNS update extension which determines the priority of the request.
- setSecDNSUpdateForRem(List<*Integer*>, `boolean`) – Sets the list of <*Integer*> instances (i.e key tags of DS records) in order to remove delegation signer information. It also supports setting of an *urgent* attribute in the SecDNS update extension which determines the priority of the request.
- setCoaUpdateForPut(List<*EPPCoaExtAttr*>) - Sets the list of <*EPPCoaExtAttr*> instances (which in turn each specify a single key/value pair) to be associated with the object being updated. If the object already has a value for one or more of the specified keys, the existing value will be overwritten by the specified one.
- setCoaUpdateForRem(List<*EPPCoaExtKey*>) - Sets the list of <*EPPCoaExtKey*> instances specifying the key portions of existing key/value pairs to be removed from the object being updated.
- addExtension(EPPCodecComponent) – Sets the extension, if any (Ex. EPPPremiumDomainReAssignCmd for Premium Domain (ReAssign) extension.)

13.14.1.6.2 Post-Conditions

On success, an *EPPResponse* is returned, with no attributes.

13.14.1.6.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the server response, then *getResponse()* will return *null*.

13.14.1.6.4 Sample Code

The following example shows the steps of performing an update of an domain through the use of the *NSDomain* client interface and the *sendUpdate()* method:

```
try {
  domain.setTransId("ABC-12345-XYZ");
  domain.addDomainName("abcdefg.tv");
  domain.setSubProductID(NSSubProduct.TV);

  // Execute update
  domain.addHostName("a.b.com");
  domain.addHostName("a.c.com");

  // instantiate the rem DS Key Tag List
  List remKeyTags = new ArrayList();
  remKeyTags.add(new Integer( 34095 ) );
  remKeyTags.add new Integer( 10563 );

        // Call only if server supports updating delegation signer
        // information
        domain.setSecDNSUpdateForRmv(remKeyTags);

  // Call only when premium domain (reassign) extension need to be set
  EPPPremiumDomainReAssignCmd extension =
                new EPPPremiumDomainReAssignCmd();
  extension.setShortName("testregistrar");
  domain.addExtension(extension);


  response = domain.sendUpdate();

} // end of try block
catch (EPPCommandException cmdException) {
  // do something to handle the exception
  handleException(cmdException);
} // end of catch block
```

13.14.1.7 sendRenew() method

The sendRenew*()* method sends the EPP renew domain command to the server.

13.14.1.7.1 Pre-Conditions

This method expects that the domain object be populated with the unique identifier of the domain to be updated and the attributes to change. The following methods must be called to populate the domain name:

- addDomainName(String) – call the add domain name method passing the unique domain name in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.
- setExpirationDate(Date) – the current expiration date needs to be set to confirm the renewal.
- SetPeriodUnit(String) – the period for which the domain is to be renewed

13.14.1.7.2 Post-Conditions

On success, an *EPPDomainRenewResp* is returned, with the following attributes:

- Name – the name of the domain being created.
- ExpirationDate – the new date that the domain is due to be renewed.

13.14.1.7.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the server response, then *getResponse()* will return *null*.

13.14.1.7.4 Sample Code

The following example shows the steps of performing an renewal of an domain through the use of the *NSDomain* client interface and the *sendRenew()* method:

```
try {
  domain.setTransId("ABC-12345-XYZ");
  domain.addDomainName("abcdefg.tv");
  domain.setSubProductID(NSSubProduct.TV);

  // Execute update
  domain.setExpirationDate(theCurrentExpirationDate);
  domain.setPeriodUnit("1");

  // Set the price value
  vector someExtensions = new vector;
  someExtensions.addElement(new EPPNSDomBillRenew("50.00"));
  domain.getExtension().addExtensions(someExtensions);


  response = (EPPDomainRenewResp) domain.sendRenew();

  //-- Output response attributes using accessors
  System.out.println("domainRenew: name = " +
          response.getName());

  System.out.println("domainRenew: ExpirationDate = " +
          response.getExpirationDate());

} // end of try block
catch (EPPCommandException cmdException) {
  // do something to handle the exception
  handleException(cmdException);
} // end of catch block
```

13.14.1.8 sendTransfer() method

The sendTransfer*()* method sends the EPP transfer domain command to the server. There are three different operations that can be performed with a *sendTransfer()* command – request a transfer, approve a transfer or reject a transfer. A transfer is initiated by the new registrar sending a transfer request. Once a transfer has been requested, the current registrar of record will be notified by an external method. The current registrar is then required to either approve or reject the transfer.

13.14.1.8.1 Pre-Conditions

This method expects that the domain object be populated with the unique identifier of the domain to be updated and the attributes to change. The following methods must be called to populate the domain name:

- addDomainName(String) – call the add domain name method passing the unique domain name in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from

com.verisign.epp.namestore.interfaces.NSSubProduct or the TLD value going forward.

- SetTransferOpCode(String) – sets the operation code for this particular call. Valid values are "TRANSFER_REQUEST", "TRANSFER_APPROVE" or "TRANSFER_REJECT"

13.14.1.8.2 Post-Conditions

On success, an *EPPDomainTransferResp* is returned, with attributes depending on the operation code requested.

For "TRANSFER_REQUEST":

- ActionDate – The date at which the transfer must be approved or rejected by, otherwise it will be accepted by default.

For "TRANSFER_APPROVE" and "TRANSFER_REJECT" no additional attributres are set.

13.14.1.8.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the server response, then *getResponse()* will return *null*.

13.14.1.8.4 Sample Code

The following example shows the steps of performing a transfer request of a domain through the use of the *NSDomain* client interface and the *sendTransfer()* method:

```
try {
  domain.setTransId("ABC-12345-XYZ");
  domain.addDomainName("abcdefg.cc");
  domain.setSubProductID(NSSubProduct.CC);
  domain.setTransferOpCode("TRANSFER_REQUEST");

  // Execute update

  response = (EPPDomainTransferResp) domain.sendTransfer();

  System.out.println ("domainTransfer: Action Date: " +
          response.getActionDate());

} // end of try block
catch (EPPCommandException cmdException) {
  // do something to handle the exception
  handleException(cmdException);
} // end of catch block
```

The following example shows the steps of performing a transfer approve of a domain through the use of the *NSDomain* client interface and the *sendTransfer()* method:

```
try {
  domain.setTransId("ABC-12345-XYZ");
  domain.addDomainName("abcdefg.cc");
  domain.setTransferOpCode("TRANSFER_APPROVE");

  // Execute update

  response = (EPPDomainTransferResp) domain.sendTransfer();

} // end of try block
catch (EPPCommandException cmdException) {
  // do something to handle the exception
  handleException(cmdException);
} // end of catch block
```

The following example shows the steps of performing a transfer reject of a domain through the use of the *NSDomain* client interface and the *sendTransfer()* method:

```
try {
  domain.setTransId("ABC-12345-XYZ");
  domain.addDomainName("abcdefg.cc");
  domain.setTransferOpCode("TRANSFER_REJECT");

  // Execute update

  response = (EPPDomainTransferResp) domain.sendTransfer();

} // end of try block
catch (EPPCommandException cmdException) {
  // do something to handle the exception
  handleException(cmdException);
} // end of catch block
```

13.14.1.9 sendRestoreRequest() method

The *sendRestoreRequest()* method sends the EPP restore request, which is encoded as an EPP update command with an rgp:update command/response extension.

13.14.1.9.1 Pre-Conditions

The following list shows the accessor methods for the required attributes:

- addDomainName(String) – add the domain name to the object in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.

13.14.1.9.2 Post-Conditions

On success, an *EPPResponse* is returned, with no attributes.

13.14.1.9.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the server response, then *getResponse()* will return *null*.

13.14.1.9.4 Sample Code

The following example shows the steps of performing an update of an domain through the use of the *NSDomain* client interface and the *sendRestoreRequest()* method:

```
```

```
try {
  domain.setTransId("ABC-12345-XYZ");
  domain.addDomainName("abcdefg.tv");
  domain.setSubProductID(NSSubProduct.TV);

  response = domain.sendRestoreRequest();

} // end of try block
catch (EPPCommandException cmdException) {
  // do something to handle the exception
  handleException(cmdException);
} // end of catch block
```

13.14.1.10 sendRestoreReport() method

The *sendRestoreReport()* method sends the EPP restore report, which is encoded as an EPP update command with an rgp:update command/response extension. The EPP restore report follows a previous call to *sendRestoreRequest()*.

13.14.1.10.1 Pre-Conditions

The following list shows the accessor methods for the required attributes:

- addDomainName(String) – add the domain name to the object in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.
- setReport(EPPRgpExtReport) – Sets the details of the restore report.

13.14.1.10.2 Post-Conditions

On success, an *EPPResponse* is returned, with no attributes.

13.14.1.10.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the server response, then *getResponse()* will return *null*.

13.14.1.10.4 Sample Code

The following example shows the steps of performing an update of an domain through the use of the *NSDomain* client interface and the *sendRestoreReport()* method:

```
try {
  domain.setTransId("ABC-12345-XYZ");
  domain.addDomainName("abcdefg.tv");
  domain.setSubProductID(NSSubProduct.TV);

  EPPRgpExtReport theReport = new EPPRgpExtReport();
  theReport.setPreData("Pre-delete whois data goes here. Both XML and
free text are allowed");
  theReport.setPostData("Post-delete whois data goes here. Both XML and
free text are allowed");
  theReport.setDeleteTime(new Date());
  theReport.setRestoreTime(new Date());
  theReport.setRestoreReason(new EPPRgpExtReportText("Registrant
Error");
       theReport.setStatement1(new EPPRgpExtReportText(
             "This registrar has not"
             + " restored the Registered Domain in order to "
             + "assume the rights to use or sell the Registered"
             + " Name for itself or for any third party"));


        theReport.setStatement2(new EPPRgpExtReportText(
             "The information in this report "
             + " is true to best of this registrar's knowledge, and
this"
             + "registrar acknowledges that intentionally supplying
false"
             + " information in this report shall "
             + "constitute  an incurable material breach of the
Registry-Registrar"
             + " Agreement"));


         theReport.setOther("other stuff");


         // Execute restore report
         domain.setReport(theReport);
         theResponse = domain.sendRestoreReport();
} // end of try block
catch (EPPCommandException cmdException) {
  // do something to handle the exception
  handleException(cmdException);
} // end of catch block
```

13.14.1.11 sendSync() method

The *sendSync()* method sends the EPP restore request, which is encoded as an EPP update command with an sync:update command/response extension.

13.14.1.11.1 Pre-Conditions

The following list shows the accessor methods for the required attributes:

- addDomainName(String) – add the domain name to the object in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.
- setMonth(int) – Sets the month using a *Calendar* constant of the target expiration date.
- setDay(int) – Sets the day of the target expiration date.

13.14.1.11.2 Post-Conditions

On success, an *EPPResponse* is returned, with no attributes.

13.14.1.11.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the server response, then *getResponse()* will return *null*.

13.14.1.11.4 Sample Code

The following example shows the steps of performing an update of an domain through the use of the *NSDomain* client interface and the *sendSync()* method:

```
try {
  domain.setTransId("ABC-12345-XYZ");
  domain.addDomainName("abcdefg.tv");
  domain.setSubProductID(NSSubProduct.TV);
  domain.setMonth(Calendar.JUNE);
  domain.setDay(15);

  response = domain.sendSync();

} // end of try block
catch (EPPCommandException cmdException) {
  // do something to handle the exception
  handleException(cmdException);
} // end of catch block
```

13.14.2 Host Mapping (NSHost Interface)

The Host Mapping is first handled by the *com.verisign.epp.interfaces.EPPHost* interface class, which is extended by the *com.verisign.epp.namestore.interfaces.NSHost* interface to add support for common extensions. Convenience methods are provided in *NSHost* to make managing hosts easier. For example, the method *setSubProductID* is provided instead of having to manually add the *EPPNamestoreExtNamestoreExt* with each action.

The *NSHost* interface has the following relevant methods:

Return Value	Parameters
	`NSHost(EPPSession aNewSession)` This is the constructor method and it requires an EPP session object to be passed that has been authenticated (e.g. logged in).
`void`	`addHostName(java.lang.String)` This method adds a host name to the object for use with the action methods.
`EPPResponse`	`getResponse()` This method returns the EPP Response for the last executed command on the interface.
`EPPResponse`	**`sendCheck()`** This method sends the host check command to the server.
`EPPResponse`	**`sendCreate()`** This method sends the host create command to the server.
`EPPResponse`	**`sendDelete()`** This method sends the host delete command to the server.
`EPPResponse`	**`sendInfo()`** This method sends the host info command to the server.
`EPPResponse`	**`sendUpdate()`** This method sends the host update command to the server.
`void`	`addIPV4Address(java.lang.String)` This method adds an Ipv4 address to the host object.
`void`	`removeIPV4Address(java.lang.String)` This method removes an Ipv4 address from the host object.
`void`	`setNewName(java.lang.String)` This method sets a new value of the host name for use with the update method.
`void`	`addExtension(EPPCodecComponent)` This method sets the EPP extension for the host object.

Return Value	Parameters
Vector	getExtensions() This method gets the EPP extensions for the host object.
void	setTransId(java.lang.String) This methods sets the client transaction identifier.
void	setSubProductID(String) Sets the NameStore sub-product id associated with the action method. The *NSSubProduct* class includes a set of constant that can be used as the *setSubProductID* argument value.
void	addOrgId(EPPOrgExtId) Adds an org identifier with role for use with sendCreate().
Void	addUpdateOrgId(int, EPPOrgExtId) Adds an org identifier with role for use with sendUpdate().

Action methods are prefixed with *send* and are shown in bold in the previous table. Each action method has a different set of pre-conditions defining what attributes need to be set with the *NSHost* setter methods. Each action method will return a response from the server and will throw an exception if any error occurs. If the exception is associated with an error response from the server, then the response can be retrieved from the exception with a call to *getResponse()*. The following sections describe and provide sample code for the action methods, the *NSHost* constructor and methods requiring additional explanation.

13.14.2.1 NSHost() method

The NSHost constructor requires that an authenticated *EPPSession* object be passed upon creation. Once created, the *NSHost* object can perform multiple functions without reinitializing the *EPPSession* object. For example, you can use the same initialized *NSHost* object to create and info a host with the *sendCreate()* and *sendInfo()* commands.

13.14.2.1.1 Pre-Conditions

An authenticated session has been successfully established with an *EPPSession*.

13.14.2.1.2 Post-Conditions

The *NSHost* instance is ready for the execution of one or more operations.

13.14.2.1.3 Exceptions

None

13.14.2.1.4 Sample Code

The following example shows the steps of initializing an *EPPSession*, using the *EPPSession* to initialize the *NSHost* interface, then setting the extension.

```
EPPSession session = new EPPSession();

// optional
session.setTransId("ABC-12345-XYZ");
session.setVersion("1.0");
session.setLang("en");

// required
session.setClientID("ClientXID");
session.setPassword("ClientXPass");

try {
  session.initSession();
}
catch (EPPCommandException ex) {
  ex.printStackTrace();
  System.exit(1);
}

NSHost host = new NSHost(session);
```

13.14.2.2 sendCheck() method

The *sendCheck()* method sends the EPP check host command to check the allowable flag for one or more hosts.

13.14.2.2.1 Pre-Conditions

The following method must be called to populate the host names:

- addHostName(String) – add a host name to the object in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.

13.14.2.2.2 Post-Conditions

On success, an *EPPHostCheckResp* is returned, with the following attributes:

- Results – the check results are returned in a vector containing one or more *EPPHostCheckResult* objects.

13.14.2.2.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the Server response, then *getResponse()* will return *null*.

13.14.2.2.4 Sample Code

The following example shows the steps of performing a check on hosts through the use of the *Host* client interface and the *sendCheck()* method:

```
try {
  // Check single host name
  host.setTransId("ABC-12345-XYZ");
  host.addHostName("ns.myhost.net");
  host.setSubProductID(NSSubProduct.CC);

  response = (EPPHostCheckResp) host.sendCheck();


  // Correct number of results?
  Assert.assertEquals(1, response.getCheckResults().size());

  // For each result
  for (int i = 0; i < response.getCheckResults().size(); i++) {
          EPPHostCheckResult currResult = (EPPHostCheckResult)
                  response.getCheckResults().elementAt(i);

          if (currResult.isAvailable()){
                  System.out.println("hostCheck: Host " +
                          currResult.getName() + " is available");
          } else {
                  System.out.println("hostCheck: Host " +
                          currResult.getName() + " is not available");
          }
  }
} // end of try block
catch (EPPCommandException cmdException) {

  // do something to handle the exception
  handleException(cmdException);

} // end of catch block
```

13.14.2.3 sendCreate() method

The *sendCreate()* method sends the EPP create host command to the server.

13.14.2.3.1 Pre-Conditions

This method expects that the host object be populated with the name and address of the host to be created. The following methods must be called to populate the host name and address:

- addHostName(String) – add a host name to the object in preparation for an action method.

- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.
- setIPV4Address(String) or setIPV6Address(String) – add an Ipv4 or Ipv6 address to the host object.

13.14.2.3.2 Post-Conditions

On success, an *EPPHostCreateResp* is returned, with the following attributes:

- Name – the host name that was successfully created is returned in the response.

13.14.2.3.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the Server response, then *getResponse()* will return *null*.

13.14.2.3.4 Sample Code

The following example shows the steps of performing a create of a host through the use of the *NSHost* client interface and the *sendCreate()* method:

```
try {

  host.setTransId("ABC-12345-XYZ");
  host.addHostName("ns.myhost.net");
  host.setIPV4Address("123.34.34.2");
  host.setSubProductID(NSSubProduct.NET);

  response = (EPPHostCreateResp) host.sendCreate();

  System.out.println("Host created: " + response.getName());

} // end of try block
catch (EPPCommandException cmdException) {

  // do something to handle the exception
  handleException(cmdException);

} // end of catch block
```

13.14.2.4 sendDelete() method

The *sendDelete()* method sends the EPP delete host command to the server. This method requires that no domains are associated with the host prior to deletion. If there are domains associated with the host the delete will fail.

13.14.2.4.1 Pre-Conditions

This method expects that the host object be populated with the name of the host to be deleted. The following method must be called to populate the host name:

- addHostName(String) – add a host name to the object in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.

13.14.2.4.2 Post-Conditions

On success, a standard *EPPResponse* is returned.

13.14.2.4.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the Server response, then *getResponse()* will return *null*.

13.14.2.4.4 Sample Code

The following example shows the steps of performing a delete of a host through the use of the *NSHost* client interface and the *sendDelete()* method:

```
try {

  host.setTransId("ABC-12345-XYZ");
  host.addHostName("ns.myhost.net");
  host.setSubProductID(NSSubProduct.NET);

  response = (EPPResponse) host.sendDelete();

  System.out.println("EPP Response: " + response);

} // end of try block
catch (EPPCommandException cmdException) {

  // do something to handle the exception
  handleException(cmdException);

} // end of catch block
```

13.14.2.5 sendInfo() method

The *sendInfo()* method sends the EPP info host command to the server.

13.14.2.5.1 Pre-Conditions

This method expects that the host object be populated with a single host name of the host to be queried. The following method must be called to populate the host name:

- addHostName(String) – add a host name to the object in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.

13.14.2.5.2 Post-Conditions

On success, an *EPPHostInfoResp* is returned, with the following attributes:

- name – the fully qualified host name.
- address – the Ipv4 or Ipv6 address of the host.
- RegistrarId – the identifier of the registrar the contact was created by.

13.14.2.5.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the Server response, than *getResponse()* will return *null*.

13.14.2.5.4 Sample Code

The following example shows the steps of querying an host through the use of the *NSHost* client interface and the *sendInfo()* method:

```
try {

  host.setTransId("ABC-12345-XYZ");
  host.addHostName("ns.myhost.net");
  host.setSubProductID(NSSubProduct.NET);

  response = (EPPHostInfoResp) host.sendInfo();

  System.out.println("hostInfo: name = " + response.getName());

  EPPHostAddress currAddress = (EPPHostAddress) response.getAddress();
  System.out.println("hostInfo: ip = ");

  // IPV4 Address?
  if (currAddress.getType() == EPPHostAddress.IPV4) {
         System.out.println(", type = IPV4");
  } // IPV6 Address?
  else if (currAddress.getType() == EPPHostAddress.IPV4) {
         System.out.println(", type = IPV6");
  }

  System.out.println("hostInfo: registrar = " +
         response.getRegistrar());

} // end of try block
catch (EPPCommandException cmdException) {

  // do something to handle the exception
  handleException(cmdException);

} // end of catch block
```

13.14.2.6 sendUpdate() method

The *sendUpdate()* method sends the EPP update host command to the server.

13.14.2.6.1 Pre-Conditions

This method expects that the host object be populated with the name of the host to be updated and the Ipv4 or Ipv6 address to change. The following methods must be called to populate the host name with a new address:

- addHostName(String) – add a host name to the object in preparation for an action method.
- setSubProductID(String) – sub-product associated with operation. Use one of the constants from *com.verisign.epp.namestore.interfaces.NSSubProduct* or the TLD value going forward.
- addIPV4Address (String) or addIPV6Address (String) – add an Ipv4 or Ipv6 address to the host object.
- removeIPV4Address (String) or removeIPV4Address (String) – remove an Ipv4 or Ipv6 address from the host object.

13.14.2.6.2 Post-Conditions

On success, a standard *EPPResponse* is returned.

13.14.2.6.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the Server response, then *getResponse()* will return *null*.

13.14.2.6.4 Sample Code

The following example shows the steps of performing an update of a host through the use of the *NSHost* client interface and the *sendUpdate()* method:

```
try {
  host.setTransId("ABC-12345-XYZ");
  host.addHostName("ns.myhost.net");
  host.setSubProductID(NSSubProduct.NET);

  // set new IP address
  host.addIPV4Address("123.34.34.12");
  // remove old IP address
  host.removeIPV4Address("123.34.34.66");

  response = (EPPResponse) host.sendUpdate();

  System.out.println("Host updated: " + response);
} // end of try block
catch (EPPCommandException cmdException) {
  // do something to handle the exception
  handleException(cmdException);
} // end of catch block
```

13.14.2.7 NSHost Support Classes

The Host package, *com.verisign.epp.codec.host*, contains additional classes required for host provisioning and maintenance. The package contains the following relevant classes:

Class	Description
EPPHostAddress	This class is used by the *sendInfo()* method for encapsulating Ipv4 and Ipv6 addresses.
EPPHostCheckResult	This class is used by the *sendCheck()* method for returning the allowable flag for multiple hosts being checked.

13.14.2.8 EPPHostAddress

The *EPPHostAddress* class is used by the *sendInfo()* method for encapsulating Ipv4 and Ipv6 addresses. The *getType()* method should be used for determining whether the address is an Ipv4 or Ipv6 address. The *getName()* and *getAddress()* methods return the host name and IP address, respectively, for the host queried. Please refer to the previous sections for sample code demonstrating the use of the *EPPHostAddress* class.

13.14.2.9 EPPHostCheckResult

The *EPPHostCheckResult* class is used by the *sendCheck()* method for returning the allowable flag for multiple hosts. The *isAvailable()* method of this class returns *true* if the host is available and *false* if the host is not available.

13.14.3 Contact Mapping (NSContact Interface)

This section is intended to provide users of the Extensible Provisioning Protocol (EPP) Software Development Kit (SDK) with an overview of the Contact, additions to the SDK. This document includes the following Contact information:

1. Definition of the Contact files (i.e. library, schema)
2. Description of the Contact interface class, including the pre-conditions, the post-conditions, the exceptions and sample code of each of the action methods.

The SDK provides detailed interface information in HTML Javadoc. This document does not duplicate the detailed interface information contained in the HTML Javadoc. Descriptions are provided for the Contact interface elements, the pre-conditions, the post-conditions, and example code.

It is assumed that the reader has reviewed the associated EPP Specifications and has a general understanding of the EPP concepts. Much of the EPP details are encapsulated in the SDK, but having a solid understanding of the EPP concepts will help in effectively using the SDK.

The Contact Mapping is first handled by the *com.verisign.epp.interfaces.EPPContact* interface class, which is extended by the *com.verisign.epp.namestore.interfaces.NSContact* interface to add support for common extensions. Convenience methods are provided in *NSContact* to make managing domains easier. For example, the method *setSubProductID* is provided instead of having to manually add the *EPPNamestoreExtNamestoreExt* with each action.

13.14.3.1 Contact Mapping Packages

Contact consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the SDK packages.

Package	Description
com.verisign.epp.codec.contact	Contact EPP Encoder/Decoder package. All of the detail of encoding and decoding the Contact EPP messages are encapsulated in this package. The *EPPContactMapFactory* must be added to the *EPP.MapFactories* configuration parameter.
com.verisign.epp.interfaces	Addition of the *EPPContact* Client interface class, which is the primary class used by a Contact SDK client.
com.verisign.epp.serverstub	Addition of the *com.verisign.epp.serverstub.ContactHandler* class used to implement the EPP Contact Stub Server behavior. This class must be added to the *EPP.ServerEventHandlers* configuration parameter.

13.14.3.2 Contact Mapping XML Schema Files

The Contact EPP Mapping is defined using XML schema files. These files are located in the *epp-contact.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
contact-1.0.xsd	schemas	Contact XML Schema. This file must reside in the current directory of the client application and the EPP Stub Server.

13.14.3.3 Contact Client Interface

13.14.3.3.1 Overview

Figure 11 - EPPContact Class Diagram shows the class diagram for *EPPContact*, which is the primary interface used for managing Contact objects. Some classes out of the *com.verisign.epp.codec.gen* are used to support the interface. There is a reference from *EPPContact* to an *EPPSession*. The action methods are prefixed with *send*, and each action method has a different set of pre-conditions defining what attributes need to be set with the *EPPContact* setter methods. Each action method will return a response from the EPP Server and will throw an exception if any error occurs. If the exception is associated with an error response from the EPP Server, than the response can be retrieved from the exception with a call to *getResponse()*.



Figure 11 - EPPContact Class Diagram

13.14.3.3.2 Initialization

This section shows how an *EPPContact* is initialized. After each operation, *EPPContact* resets itself so that it can be used for more than one operation. For example, you can use the same initialized *EPPContact* to create a Contact with *sendCreate()*, than use it again to delete a Contact with *sendDelete()*. The attributes have to be set/reset before each call to an operation.

1.1.1.1.1.1 Pre-Conditions

An authenticated session has been successfully established with an *EPPSession*.

1.1.1.1.1.2 Post-Conditions

The *EPPContact* instance is ready for the execution of one or more operations.

1.1.1.1.1.3 Exceptions

None

1.1.1.1.1.4 Sample Code

Figure 12 - EPPContact Initialization Sample Code shows the steps of initializing an *EPPSession*, than using the *EPPSession* to initialize and *EPPContact.*

```
EPPSession session = new EPPSession();
session.setClientID("ClientX");
session.setPassword("ClientXPass");
session.setTransId("ABC-12345");

try {
        session.initSession();
}
catch (EPPCommandException ex) {
        ex.printStackTrace();
        System.exit(1);
}

EPPContact contact = EPPContact(session);
```

Figure 12 - EPPContact Initialization Sample Code

13.14.3.3.3 sendCreate() Method

Creates a Contact using this method. *sendCheck()* can be used to check the availability of a Contact before invoking *sendCreate()*.

1.1.1.1.1.5 Pre-Conditions

The following methods must be called:

- *addContactId(String)* – Contact ID.
- *addPostalInfo(EPPContactPostalDefinition)* – Sets the postal information of the contact.
- *setEmail(String)* – Sets the email address of the contact.
- *setAuthorizationId(String)* - Authorization string, which is provided by client.

The following methods can be called:

- *setVoicePhone(String)* – Sets the voice phone number for the contact.
- *setVoiceExt(String)* – Sets the extension for the voice phone number of the contact.
- *setFaxNumber(String)* – Sets the fax number for the contact
- *setFaxExt(String)* – Sets the extension for the fax number of the contact
- *setDisclose(EPPContactDisclose)* – Sets the disclose information about the contact.
- *addExtension(EPPCodecComponent)* – Sets the extension, if any
- *setTransId(String)* – Client transaction identifier, which is mirrored back in the response.

1.1.1.1.1.6 Post-Conditions

The Contact was successfully created. *EPPContactCreateResp* is returned, with the following attributes:

- <epp:extension> - *EPPResponse.getExtension() if response contains extension*
- <epp:trID> - *EPPResponse.getTransId()*
- <contact:id> – *EPPContactCreateResp.getId()*
- <contact:crDate> – *EPPContactCreateResp.getCreationDate()*

This response does not have Contact related information except for the creation date. The response may not even contain an extension.

1.1.1.1.1.7 Exceptions

EPPCommandException that contains the *EPPResponse* returned from the EPP Server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the EPP Server response, than *getResponse()* will return *null*.

1.1.1.1.1.8 Sample Code

Figure 13 - sendCreate() Sample Code shows the steps of creating a Contact. On success, *EPPContactCreateResp* is returned, which contains the contact Id and creation date. If an error occurs, *EPPCommandException* is thrown, and if the error was the result of an EPP Server response, than the response can be retrieved from the exception.

```
try {

        contact.setTransId("ABC-12345-XYZ");
        contact.setAuthorizationId("ClientXYZ");
        contact.addContactId("sh8013");
        contact.setVoicePhone("+1.7035555555");
        contact.setVoiceExt("123");
        contact.setFaxNumber("+1.7035555556");
        contact.setFaxExt("456");
        contact.setEmail("jdoe@example.com");

        // Streets
        Vector streets = new Vector();
        streets.addElement("123 Example Dr.");
        streets.addElement("Suite 100");
        streets.addElement("This is third line");

        EPPContactAddress address = new EPPContactAddress();
        address.setStreets(streets);
        address.setCity("Dulles");
        address.setStateProvince("VA");
        address.setPostalCode("20166-6503");
        address.setCountry("US");

        EPPContactPostalDefinition name = new EPPContactPostalDefinition(

        EPPContactPostalDefinition.ATTR_TYPE_LOC);

        name.setName("John Doe");
        name.setOrg("Example Inc.");
        name.setAddress(address);

        contact.addPostalInfo(name);

        // this is not a valid Example but it will do
        EPPContactAddress Intaddress = new EPPContactAddress();

        Intaddress.setStreets(streets);
        Intaddress.setCity("Dulles");
        Intaddress.setStateProvince("VA");
        Intaddress.setPostalCode("20166-6503");
        Intaddress.setCountry("US");

        EPPContactPostalDefinition Intname = new EPPContactPostalDefinition(

        EPPContactPostalDefinition.ATTR_TYPE_INT);

        Intname.setName("John Doe");
        Intname.setOrg("Example Inc.");
        Intname.setAddress(Intaddress);

        contact.addPostalInfo(Intname);

        // disclose names
        Vector names = new Vector();

        // names.addElement(new
```

```
        // EPPContactDiscloseName(EPPContactDiscloseName.ATTR_TYPE_LOC));
        names.addElement(new EPPContactDiscloseName(
        EPPContactDiscloseName.ATTR_TYPE_INT));

        // disclose orgs
        Vector orgs = new Vector();
        orgs.addElement(new EPPContactDiscloseOrg(
        EPPContactDiscloseOrg.ATTR_TYPE_LOC));
        orgs.addElement(new EPPContactDiscloseOrg(
        EPPContactDiscloseOrg.ATTR_TYPE_INT));

        // disclose addresses
        Vector addresses = new Vector();
        addresses.addElement(new EPPContactDiscloseAddress(

        EPPContactDiscloseAddress.ATTR_TYPE_LOC));
        addresses.addElement(new EPPContactDiscloseAddress(

        EPPContactDiscloseAddress.ATTR_TYPE_INT));

        // disclose
        EPPContactDisclose disclose = new EPPContactDisclose();
        disclose.setFlag("0");
        disclose.setNames(names);
        disclose.setOrgs(orgs);
        disclose.setAddresses(addresses);
        disclose.setVoice("");
        disclose.setFax("");
        disclose.setEmail("");

        contact.setDisclose(disclose);

        response = (EPPContactCreateResp) contact.sendCreate();

        // -- Output all of the response attributes
        System.out.println("contactCreate: Response = [" + response
                + "]\n\n");
        System.out.println("Contact ID : " + response.getId());
        System.out.println("Contact Created Date : " +
                response.getCreationDate());

}
```

Figure 13 - sendCreate() Sample Code

13.14.3.3.4 sendCheck() Method

Checks the availability of one or more Contact objects.

1.1.1.1.1.9 Pre-Conditions

The following methods must be previously called:

- *addContactId(String)* – Contact Id.

The following methods can be previously called:

- setTransId(String) – Client transaction identifier, which is mirrored back in the response.

1.1.1.1.1.10 Post-Conditions

The Contact was successfully checked. *EPPContactCheckResp* is returned with the following attributes:

- <epp:extension> - *EPPResponse.getExtension()* if response contains extension
- <epp:trID> - *EPPResponse.getTransId()*
- A Vector of *EPPContactCheckResult* objects – *EPPContactInfoResp.getCheckResults()*. Each *EPPContactCheckResult* object contains the following attributes:
  - <contact:id> - *EPPContactCheckResult.getId()*
  - <contact:reason> - *EPPContactCheckResult.getContactReason()*

1.1.1.1.1.11 Exceptions

EPPCommandException that contains the *EPPResponse* returned from the EPP Server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the EPP Server response, than *getResponse()* will return *null*.

1.1.1.1.1.12 Sample Code

Figure 9 - sendCheck() Sample Code shows the steps of creating EPPContactCheckResp. If an error occurs, *EPPCommandException* is thrown, and if the error was the result of an EPP Server response, than the response can be retrieved from the exception.

```
try {
   contact.setTransId("ABC-12345");
   contact.addContactId("sh8013");

   EPPContactCheckResp response = contact.sendCheck();

  // For each result
  for (int i = 0; i < response.getCheckResults().size(); i++) {
       EPPContactCheckResult currResult = (EPPContactCheckResult) response
              .getCheckResults().elementAt(i);

       if (currResult.isAvailable()) {
              System.out.println("contactCheck: Contact "
                     + currResult.getId() + " is available");
       }
       else {
              System.out.println("contactCheck: Contact "
                     + currResult.getId() + " is unavailable");
       }
```

```
   }
}
catch (EPPCommandException ex) {
   EPPResponse response = (EPPResponse) ex.getResponse();

   if (response != null)
      System.err.println("Contact Check response error: " + ex +
         ", response = " + response);
   else
      System.err.println("Contact Check exception: " + ex);
}
```

Figure 9 - sendCheck() Sample Code

13.14.3.3.5 sendInfo() Method

Retrieves the Contact information.

1.1.1.1.1.13 Pre-Conditions

The following methods must be previously called:

- *addContactId(String)* – Contact Id.

The following methods can be previously called:

- setTransId(String) – Client transaction identifier, which is mirrored back in the response.

The Contact must exist.

1.1.1.1.1.14 Post-Conditions

The Contact information was successfully retrieved. *EPPContactInfoResp* contains the Contact information with the following attributes:

- <epp:extension> - *EPPResponse.getExtension() if response contains extension*
- <epp:trID> - *EPPResponse.getTransId()*
- <contact:id> - *EPPContactInfoResp.getId()* Gets the Contact ID
- <contact:roid> – *EPPContactInfoResp.getRoid()* Gets the Contact ROID
- <contact:status> - *EPPContactInfoResp.getStatuses()* Gets the vector of statuses
- <contact:postalinfo> - *EPPContactInfoResp.getPostalInfo()* Gets the Contact Postal Info
- <contact:voice> - *EPPContactInfoResp.getVoice()* Gets the Contact Voice number

- <contact:fax> - *EPPContactInfoResp.getFax()* Gets the Contact Fax number
- <contact:email> - *EPPContactInfoResp.getEmail()* Gets the Contact Email address
- <contact:clId> - *EPPContactInfoResp.getClientId()* Gets the Contact Client ID
- <contact:crDate> - *EPPContactInfoResp.getCreatedDate ()* Gets the Contact Creation date
- <contact:trDate> - *EPPContactInfoResp.getLastTransferDate()* Gets the Contact last transfer date
- <contact:authInfo> - *EPPContactInfoResp.getAuthInfo()* Gets the Contact Authorization information
- <contact:disclose> - *EPPContactInfoResp.getDisclose()* Gets the Contact disclose information

1.1.1.1.1.15 Exceptions

EPPCommandException that contains the *EPPResponse* returned from the EPP Server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the EPP Server response, than *getResponse()* will return *null*.

1.1.1.1.1.16 Sample Code

Figure 14 - sendInfo() Sample Code shows the steps of creating EPPContactInfoResp. If an error occurs, *EPPCommandException* is thrown, and if the error was the result of an EPP Server response, than the response can be retrieved from the exception.

```
try {
        EPPContactInfoResp contactResponse;

        System.out.println("JobsContact: Contact Info");

        contact.setTransId("ABC-12345-XYZ");
        contact.addContactId("helloworld");

        contactResponse = contact.sendInfo();

        System.out.println("contactInfo: id = " + response.getId());

        Vector postalContacts = null;

        if (response.getPostalInfo().size() > 0) {
                postalContacts = response.getPostalInfo();

        for (int j = 0; j < postalContacts.size(); j++) {

                // Name
                System.out.println("contactInfo:\t\tname = "
```

```
                + ((EPPContactPostalDefinition) postalContacts
                    .elementAt(j)).getName());

            // Organization
            System.out.println("contactInfo:\t\torganization = "
            + ((EPPContactPostalDefinition) postalContacts
            .elementAt(j)).getOrg());


            EPPContactAddress address =
                    ((EPPContactPostalDefinition)postalContacts
                            .elementAt(j)).getAddress();

            for (int i = 0; i < address.getStreets().size(); i++) {
                    System.out.println("contactInfo:\t\tstreet" + (i + 1)
                        + " = " + address.getStreets().elementAt(i));

            }

            // Address City
            System.out.println("contactInfo:\t\tcity = " +
             address.getCity());


            // Address State/Province
            System.out.println("contactInfo:\t\tstate province = "
              + address.getStateProvince());

            // Address Postal Code
            System.out.println("contactInfo:\t\tpostal code = "
              + address.getPostalCode());

            // Address County
            System.out.println("contactInfo:\t\tcountry = "
              + address.getCountry());
        }


        // Contact E-mail
        System.out.println("contactInfo:\temail = " + response.getEmail());

        // Contact Voice
        System.out.println("contactInfo:\tvoice = " + response.getVoice());

        // Contact Voice Extension
        System.out.println("contactInfo:\tvoice ext = "
                                    + response.getVoiceExt());

        // Contact Fax
        System.out.println("contactInfo:\tfax = " + response.getFax());

        // Contact Fax Extension
        System.out.println("contactInfo:\tfax ext = "
                                    + response.getFaxExt());

        // Client Id
        System.out.println("contactInfo: client id = "
```

```
                                    + response.getClientId());

        // Created By
        System.out.println("contactInfo: created by = "
                                    + response.getCreatedBy());

        // Created Date
        System.out.println("contactInfo: create date = "
                                    + response.getCreatedDate());

        // -- Output optional response attributes using accessors
        // Contact Fax
        if (response.getFax() != null) {
                System.out.println("contactInfo:\tfax = " +
                 response.getFax());
        }

        // Contact Voice
        if (response.getVoice() != null) {
                System.out.println("contactInfo:\tVoice = "
                + response.getVoice());
        }

        // Last Updated By
        if (response.getLastUpdatedBy() != null) {
                System.out.println("contactInfo: last updated by = "
                        + response.getLastUpdatedBy());
        }

        // Last Updated Date
        if (response.getLastUpdatedDate() != null) {
                System.out.println("contactInfo: last updated date = "
                + response.getLastUpdatedDate());
        }

        // Last Transfer Date
        if (response.getLastTransferDate() != null) {
                System.out.println("contactInfo: last updated date = "
                + response.getLastTransferDate());
        }

        // Authorization Id
        if (response.getAuthInfo() != null) {
                System.out.println("contactInfo: authorization info = "
                + response.getAuthInfo().getPassword());
        }

        // Disclose
        if (response.getDisclose() != null) {
                System.out.println("contactInfo: disclose info = "
                + response.getDisclose());
        }

}
```

Figure 14 - sendInfo() Sample Code

13.14.3.3.6 sendUpdate() Method

Updates the attributes of a Contact.

1.1.1.1.1.17 Pre-Conditions

The following methods must be previously called:

- *addContactId(String)* – Contact Id.

The following methods can be previously called:

- *setTransId(String)* – Client transaction identifier, which is mirrored back in the response.
- *addExtension(EPPCodecComponent)* – Command extension, if any.
- *addStatus(String)* – Contact status
- *addPostalInfo(EPPContactPostalDefinition)* – Adding postal information
- *setVoicePhone(String)* – Update voice number
- *setFaxNumber(String)* – Update fax number
- *setAuthorizationId(String)* – Update authorization information
- *setDisclose(EPPContactDisclose)* – Updates the contact disclose information

The Contact must exist.

1.1.1.1.1.18 Post-Conditions

The Contact was successfully updated. *EPPResponse* is returned, with the following attributes:

- <epp:extension> - *EPPResponse.getExtension() if response contains extension*
- <epp:trID> - *EPPResponse.getTransId()*

1.1.1.1.1.19 Exceptions

EPPCommandException that contains the *EPPResponse* returned from the EPP Server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the EPP Server response, than *getResponse()* will return *null*.

1.1.1.1.1.20 Sample Code

Figure 15 - sendUpdate() Sample Code shows the steps of creating EPPResponse. If an error occurs, *EPPCommandException* is thrown, and if the error was the result of an EPP Server response, than the response can be retrieved from the exception.

```
try {
        contact.setTransId("ABC-12345-XYZ");
        contact.addContactId("sh8013");

        // Streets
        Vector streets = new Vector();
        streets.addElement("123 Example Dr.");
        streets.addElement("Suite 100");
        streets.addElement("This is third line");

        // Address
        EPPContactAddress address = new EPPContactAddress(streets,
                                    "Dulles", "VA", "20166-6503", "US");

        EPPContactPostalDefinition postal = new EPPContactPostalDefinition(
                                    "Joe Brown", "Example Corp.",

        EPPContactPostalDefinition.ATTR_TYPE_LOC, address);

        // statuses
        contact.addStatus(EPPContact.STAT_PENDING_DELETE);
        contact.addPostalInfo(postal);
        contact.setVoicePhone("+1.7035555555");
        contact.setVoiceExt("456");
        contact.setFaxNumber("+1.7035555555");
        contact.setFaxExt("789");
        contact.setAuthorizationId("ClientXYZ");

        // disclose names
        Vector names = new Vector();

        // names.addElement(new
        // EPPContactDiscloseName(EPPContactDiscloseName.ATTR_TYPE_LOC));
        names.addElement(new EPPContactDiscloseName(
                                    EPPContactDiscloseName.ATTR_TYPE_INT));

        // disclose orgs
        Vector orgs = new Vector();
        orgs.addElement(new EPPContactDiscloseOrg(
                EPPContactDiscloseOrg.ATTR_TYPE_LOC));
        orgs.addElement(new EPPContactDiscloseOrg(
                EPPContactDiscloseOrg.ATTR_TYPE_INT));

        // disclose addresses
        Vector addresses = new Vector();
        addresses.addElement(new EPPContactDiscloseAddress(

        EPPContactDiscloseAddress.ATTR_TYPE_LOC));
                        addresses.addElement(new EPPContactDiscloseAddress(

        EPPContactDiscloseAddress.ATTR_TYPE_INT));

        // disclose
        EPPContactDisclose disclose = new EPPContactDisclose();
        disclose.setFlag("0");
        disclose.setNames(names);
        disclose.setOrgs(orgs);
```

```
        disclose.setAddresses(addresses);
        disclose.setVoice("");
        disclose.setFax("");
        disclose.setEmail("");

        contact.setDisclose(disclose);

        response = contact.sendUpdate();

        // -- Output all of the response attributes
        System.out.println("contactUpdate: Response = [" + response
                                        + "]\n\n");
} catch (EPPCommandException e) {
        handleException(e);
}
```

Figure 15 - sendUpdate() Sample Code

13.14.3.3.7 sendDelete() Method

Deletes a Contact.

1.1.1.1.1.21 Pre-Conditions

The following methods must be previously called:

- *addContactId(String)* – Contact Id.

The following methods can be previously called:

- setTransId(String) – Client transaction identifier, which is mirrored back in the response.
- setExtension(EPPCodecComponent) – Command extension to send with command.

The Contact must exist.

1.1.1.1.1.22 Post-Conditions

The Contact was successfully deleted. *EPPResponse* is returned, with the following attributes:

- <epp:extension> - *EPPResponse.getExtension() if response contains extension*
- <epp:trID> - *EPPResponse.getTransId()*

1.1.1.1.1.23 Exceptions

EPPCommandException that contains the *EPPResponse* returned from the EPP Server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the EPP Server response, than *getResponse()* will return *null*.

1.1.1.1.1.24 Sample Code

Figure 10 - sendDelete() Sample Code shows the steps of creating EPPResponse. If an error occurs, *EPPCommandException* is thrown, and if the error was the result of an EPP Server response, than the response can be retrieved from the exception.

```
try {
        contact.setTransId("ABC-12345");
        contact.addContactId("sh8013");

        EPPResponse response = contact.sendDelete();

        System.out.println("Contact Delete success response: " + response);
}
catch (EPPCommandException ex) {
        EPPResponse response = (EPPResponse) ex.getResponse();

        if (response != null)
                System.err.println("Contact Delete response error: " + ex +
                        ", response = " + response);
```

```
        else
                System.err.println("Contact Delete exception: " + ex);
}
```

Figure 10 - sendDelete() Sample Code

13.14.3.3.8 sendTransfer() Method

Transfer a Contact.

1.1.1.1.1.25 Pre-Conditions

The following methods must be previously called:

- *addContactId(String)* – Contact ID.
- *setAuthorizationId(String)* – Authorization Information. This is required when a transfer is requested.
- *setTransferOpCode(String)* – Transfer operation as defined by one of the *EPPContact.TRANSFER_* constants. For example, *EPPContact.TRANSFER_REQUEST*.

The following methods can be previously called:

- setTransId(String) – Client transaction identifier, which is mirrored back in the response.
- setExtension(EPPCodecComponent) – Command extension to send with command.

The Contact must exist.

1.1.1.1.1.26 Post-Conditions

The Contact transfer operation was successfully processed. *EPPContactTransferResp* is returned with the following attributes:

- <epp:extension> - *EPPResponse.getExtension() if response contains extension*
- <epp:trID> - *EPPResponse.getTransId()*
- <contact:id> – *EPPContactTransferResp.getId()*
- <contact:trStatus> – *EPPContactTransferResp.getTransferStatus()*
- <contact:reID> – *EPPContactTransferResp.getRequestClient()*
- <contact:reDate> – *EPPContactTransferResp.getRequestDate()*
- <contact:acID> – *EPPContactTransferResp.getActionClient()*
- <contact:acDate> – *EPPContactTransferResp.getActionDate()*

1.1.1.1.1.27 Exceptions

EPPCommandException that contains the *EPPResponse* returned from the EPP Server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the EPP Server response, than *getResponse()* will return *null*.

1.1.1.1.1.28 Sample Code

Figure 11 - sendTransfer() Sample Code shows the steps of creating EPPContactTransferResp. If an error occurs, *EPPCommandException* is thrown, and if the error was the result of an EPP Server response, than the response can be retrieved from the exception.

```
try {
        contact.setTransferOpCode(EPPContact.TRANSFER_REQUEST);
        contact.setTransId("ABC-12345-XYZ");
        contact.setAuthorizationId("ClientX");
        contact.addContactId("sh8013");

        // Execute the transfer request
        response = contact.sendTransfer();

        // -- Output all of the response attributes
        System.out.println("contactTransfer: Response = [" + response
                + "]\n\n");

        // -- Output required response attributes using accessors
        System.out.println("contactTransfer: id = " + response.getId());
        System.out.println("contactTransfer: request client = "
                + response.getRequestClient());
        System.out.println("contactTransfer: action client = "
                + response.getActionClient());
        System.out.println("contactTransfer: transfer status = "
                + response.getTransferStatus());
        System.out.println("contactTransfer: request date = "
                + response.getRequestDate());
        System.out.println("contactTransfer: action date = "
                + response.getActionDate());
}
catch (EPPCommandException ex) {
   EPPResponse response = (EPPResponse) ex.getResponse();

   if (response != null)
      System.err.println("Contact Transfer response error: " + ex +
         ", response = " + response);
   else
      System.err.println("Contact Transfer exception: " + ex);
}
```

Figure 11 - sendTransfer() Sample Code

13.14.4 Registry Mapping

This section is intended to provide users of the Extensible Provisioning Protocol (EPP) Software Development Kit (SDK) with an overview of the Registry Mapping (Propriatary and IETF draft versions) additions to the SDK. This document includes the following Registry information:

1. Definition of the Registry SDK files (i.e. library, schema)
2. Description of the Registry interface classes, including the pre-conditions, the post-conditions, the exceptions, the EPP status codes, and sample code of each of the action methods.

The SDK provides detailed interface information in HTML Javadoc format. This document does not duplicate the detailed interface information contained in the HTML Javadoc. Descriptions are provided of the main Registry interface elements, the pre-conditions, the post-conditions, and example code.

It is assumed that the reader has reviewed the associated EPP specifications and has a general understanding of the EPP concepts. Much of the EPP details are encapsulated in the SDK, but having a solid understanding of the EPP concepts will help in effectively using the SDK.

13.14.4.1 Registry Tests

The Registry source distribution contains one test program for each Registry EPP Mapping the product uses. The tests are located in the suggestion/java directory in *com.verisign.epp.interfaces* package. The following table describes the test files:

Test	Description
EPPRegistryTst.java	This is a sample program demonstrating the use of the EPPRegistry class. The *com.verisign.epp.interfaces.EPPRegistryTst* is used to test the proprietary version of the Registry Mapping. The *com.verisign.epp.interfaces.v02.EPPRegistryTst* is used to test v04 of the Registry Mapping, which is defined in draft-gould-carney-regext-registry-04.

13.14.4.2 Registry Packages

The Registry portion of the Verisign Bundle EPP SDK consists of sub-packages and class additions to existing SDK packages. Figure 12 - Registry Packages provides an overview of the primary SDK packages.

Package	Description
com.verisign.epp.codec.registry	Registry Encoder/Decoder package. All of the detail of encoding and decoding the Registry EPP messages are in this package. The EPPRegistryMapFactory must be added to the EPP.MapFactories configuration parameter using the full package and class name. The *com.verisign.epp.codec.registry.EPPRegistryMapFactory* must be added to the *EPP.MapFactories* configuration parameter for the proprietary Registry Mapping. The *com.verisign.epp.codec.registry.v02.EPPRegistryMapFactory* must be added to the *EPP.MapFactories* configuration parameter for v04 of the Registry Mapping.
com.verisign.epp.framework	Addition of Registry EPP Server Framework classes used by the Stub Server. The *com.verisign.epp.framework* for the proprietary Registry Mapping. The *com.verisign.epp.framework.v02* for the proprietary Registry Mapping.for v04 of the Registry Mapping.
com.verisign.epp.serverstub	Addition of the RegistryHandler class used to implement the EPP Registry Stub Server behavior. The *com.verisign.epp.serverstub.RegistryHandler* must be added to the *EPP.ServerEventHandlers* configuration parameter for the proprietary Registry Mapping. The *com.verisign.epp.serverstub.registry.v02.RegistryHandler* must be added to the *EPP.ServerEventHandlers* configuration parameter for v04 of the Registry Mapping.
com.verisign.epp.interfaces	This package contains the Registry client interface classes. These classes provide the primary interfaces that map to the commands and objects of the Registry EPP Mapping.

	The *com.verisign.epp.interfaces.EPPRegistry* is used for the proprietary Registry Mapping. The *com.verisign.epp.interfaces.registry.v02.EPPRegistry* is used for v04 of the Registry Mapping.

Figure 12 - Registry Packages

13.14.4.3 Registry XML Schema files

The Registry EPP Mapping is defined using XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them. The following table gives a brief description of these schema files:

File Name	Location	Description
registry-1.0.xsd	schemas	Proprietary Registry XML Schema. This file must reside in the current directory of the client application and the EPP Stub Server.
registry-0.2.xsd	schemas	V04 of the IETF Registry XML Schema. This file must reside in the current directory of the client application and the EPP Stub Server.

Figure 13 - Registry Schema Files

13.14.4.4 Registry Client Interfaces

The Registry portion of the Verisign Bundle EPP SDK contains client interface classes for the Registry EPP Mapping. The interfaces provide mechanisms for querying suggestions. The following sections describe the client interface classes, supporting classes and their respective purposes.

13.14.4.4.1 Registry Interface

The Registry interface, *EPPRegistry*, is located in the *com.verisign.epp.interfaces* package or the versioned *com.verisign.epp.interfaces.registry.vXX* package, where XX is the version of the IETF draft XML schema namespace. This interface is used to query zone information for the system.

The *EPPRegistry* interface has the following relevant methods:

Return Value	Parameters
	`EPPRegistry(EPPSession aNewSession)` This is the constructor method and it requires an EPP session object to be passed that has been authenticated (e.g. logged in).
`EPPRegistryCheckResp`	`sendCheck()` This method checks on the availability / existence of a zone. **This method is for future use.**
`EPPRegistryInfoResp`	`sendInfo()` This method is used to get registry zone information.
`EPPRegistryCreateResp`	`sendCreate()` This method creates a new zone. **This method is for future use.**
`EPPResponse`	`sendUpdate()` This method updates a new zone. **This method is for future use.**
`EPPResponse`	`sendDelete()` This method deletes a zone. **This method is for future use.**

1.1.1.1.1.29 EPPRegistry *() Constructor*

The *EPPRegistry* constructor requires that an authenticated *EPPSession* object be passed upon creation. Once created, the *EPPRegistry* object can perform multiple functions without reinitializing the *EPPSession* object. For example, you can use the same initialized *EPPRegistry* object to call the *sendInfo()* method multiple times.

1.1.1.1.1.29.1 Pre-Conditions

An authenticated session has been successfully established with an *EPPSession*.

1.1.1.1.1.29.2 Post-Conditions

The *EPPRegistry* instance is ready for the execution of one or more operations.

1.1.1.1.1.29.3 Exceptions

None

1.1.1.1.1.29.4 Sample Code

The following example shows the steps of initializing an *EPPSession*, then using the *EPPSession* to initialize the *EPPRegistry* interface.

```
EPPSession session = new EPPSession();

// optional
session.setTransId("ABC-12345-XYZ");
session.setVersion("1.0");
session.setLang("en");

// required
session.setClientID("ClientXID");
session.setPassword("ClientXPass");

try {
  session.initSession();
}
catch (EPPCommandException ex) {
  ex.printStackTrace();
  System.exit(1);
}

EPPRegistry registry = new EPPRegistry(session);
```

1.1.1.1.1.30 sendInfo() method

The sendI*nfo()* method sends the Registry EPP info command to the server. It has the following signature:

```
public EPPRegistryInfoResp sendInfo() throws EPPCommandException
```

1.1.1.1.1.30.1 Pre-Conditions

For proprietary version (com.verisign.epp.interfaces package):
Either *setAllTlds(boolean)* is called with a value of *true*, *addTld(String)* is called, or *setSystem(boolean)* is called with a value of *true*. Both *setAllTlds(true)* and *addTld(String)* cannot be called prior to calling *sendInfo()*.

For v02 version (com.verisign.epp.interfaces package.v02):
Use of *setAllScope(EPPRegistryInfoCmd.Scope)* with a valid scope, or *addZone(String) / addZone(EPPRegistryZoneName)*, or *setInfoMode(EPPRegistryInfoCmd.Scope)* with a value of *EPPRegistryInfoCmd.Scope.system*.

1.1.1.1.1.30.2 Post-Conditions

On success, an *EPPRegistryInfoResp* is returned.

1.1.1.1.1.30.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the server response, than *getResponse()* will return *null*.

1.1.1.1.1.30.4 Sample Code

The following example shows the steps of performing a Registry info using the *EPPRegistry* client interface and the *sendInfo()* method:

For proprietary version (com.verisign.epp.interfaces package):

```
EPPRegistryInfoResp response;

try {
  // Get all TLD summary information?
  if (all) {
     registry.setAllTlds(true);
  }
  else { // Get information for ".tld"
     registry.addTld(".tld");
  }
  response = registry.sendInfo();
}
 catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
  Assert.fail(e.getMessage());
  e.printStackTrace();
}
```

For v04 version (com.verisign.epp.interfaces package.v02):

```
EPPRegistryInfoResp response;

try {
  // Get all TLD summary information?
  if (all) {
     registry.setAllScope(EPPRegistryInfoCmd.Scope.both);
  }
  else if (system) {
     registry.setInfoMode(EPPRegistryInfoCmd.Mode.system);
  |
  else { // Get information for "EXAMPLE"
     registry.addZone("EXAMPLE");
  }
  response = registry.sendInfo();
}
 catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
  Assert.fail(e.getMessage());
  e.printStackTrace();
}
```

13.14.5 Verisign Balance Mapping

This section is intended to provide users of the Extensible Provisioning Protocol (EPP) Software Development Kit (SDK) with an overview of the Verisign Balance Mapping additions to the SDK. This document includes the following Balance information:

1. Definition of the Verisign Balance SDK files (i.e. library, schema)
2. Description of the Verisign Balance interface classes, including the pre-conditions, the post-conditions, the exceptions, the EPP status codes, and sample code of each of the action methods.

The SDK provides detailed interface information in HTML Javadoc format. This document does not duplicate the detailed interface information contained in the HTML Javadoc. Descriptions are provided of the main Balance interface elements, the pre-conditions, the post-conditions, and example code.

It is assumed that the reader has reviewed the associated EPP specifications and has a general understanding of the EPP concepts. Much of the EPP details are encapsulated in the SDK, but having a solid understanding of the EPP concepts will help in effectively using the SDK.

13.14.5.1 Verisign Balance Tests

The Verisign source distribution contains one test program for Verisign Balance EPP Mapping the product uses. The tests are in the nsfinance/java directory in *com.verisign.epp.interfaces* package. The following table describes the test files:

Directory	Description
EPPBalanceTst.java	This is a sample program demonstrating the use of the EPPBalance class.

13.14.5.2 Verisign Balance Packages

The Verisign Balance portion of the Verisign Bundle EPP SDK consists of sub-packages and class additions to existing SDK packages. Figure 14 - Balance Packages provides an overview of the primary SDK packages.

Package	Description
com.verisign.epp.codec.balance	Balance Encoder/Decoder package. All the detail of encoding and decoding the Verisign Balance EPP messages are in this package.

	The *EPPBalanceFactory* must be added to the EPP.MapFactories configuration parameter using the full package and class name.
com.verisign.epp.framework	Addition of Verisign Balance EPP Server Framework classes used by the Stub Server.
com.verisign.epp.serverstub	Addition of the *com.versigin.epp.serverstub.BalanceHandler* class used to implement the EPP Verisign Balance Stub Server behavior. This class must be added to the EPP.ServerEventHandlers configuration parameter using the full package and class names.
com.verisign.epp.interfaces	This package contains the Balance client interface classes. These classes provide the primary interfaces that map to the commands and objects of the Balance EPP Mapping.

Figure 14 - Balance Packages

13.14.5.3 Balance XML Schema files

The Balance EPP Mapping is defined using XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them. The following table gives a brief description of these schema files:

File Name	Location	Description
balance-1.0.xsd	schemas	Balance XML Schema. This file must reside in the current directory of the client application and the EPP Stub Server.

Figure 15 - Balance Schema Files

13.14.5.4 Balance Client Interfaces

The Balance portion of the Verisign Bundle EPP SDK contains client interface classes for the Balance EPP Mapping. The interfaces provide mechanisms for getting the account balance and other financial information. The following sections describe the client interface classes, supporting classes and their respective purposes.

13.14.5.4.1 Balance Interface

The Balance interface, *EPPBalance*, is located in the *com.verisign.epp.interfaces* package. This interface is used to get the account balance and other financial information.

The *EPPBalance* interface has the following relevant methods:

Return Value	Parameters
	`EPPBalance(EPPSession aSession)` This is the constructor method and it requires an EPP session object to be passed that has been authenticated (e.g. logged in).
`EPPBalanceInfpResp`	`sendInfo()` This method is used to retrieve the account balance and other financial information.

The method on the *EPPBalance* takes request data that will be sent to the server. The only precondition that exists on the methods of this class is that a valid EPPSession is used to create the instance. There is no other state associated with this class so all data passed as arguments is sent to the server as is. The method will return a response from the Server and will throw an exception if any error occurs. If the exception is associated with an error response from the Server, then the response can be retrieved from the exception with a call to *getResponse()*. The following sections describe and provide sample code for the method and the *EPPBalance* constructor.

1.1.1.1.1.31 EPPBalance *() Constructor*

The *EPPBalance* constructor requires that an authenticated *EPPSession* object be passed upon creation. Once created, the *EPPBalance* object can perform multiple functions without reinitializing the *EPPSession* object. For example, you can use the same initialized *EPPBalance* object to get the balance information with the *sendInfo()* command.

1.1.1.1.1.31.1 Pre-Conditions

An authenticated session has been successfully established with an *EPPSession*.

1.1.1.1.1.31.2 Post-Conditions

The *EPPBalance* instance is ready for the execution of one or more operations.

1.1.1.1.1.31.3 Exceptions

None

1.1.1.1.1.31.4 Sample Code

The following example shows the steps of initializing an *EPPSession*, then using the *EPPSession* to initialize the *EPPBalance* interface.

```
EPPSession session = new EPPSession();
```

```
// optional
session.setTransId("ABC-12345-XYZ");
session.setVersion("1.0");
session.setLang("en");

// required
session.setClientID("ClientXID");
session.setPassword("ClientXPass");

try {
        session.initSession();
}
catch (EPPCommandException ex) {
        ex.printStackTrace();
        System.exit(1);
}

EPPBalance balance = new EPPBalance(session);
```

1.1.1.1.1.32 sendInfo() method

The sendI*nfo()* method sends the Balance EPP info command to the Server. It has the following signature:

```
public EPPBalanceInfoResp sendInfo() throws EPPCommandException
```

1.1.1.1.1.32.1 Pre-Conditions

1. The client transaction id should be set by calling *setTransId(String aTransId)* method.

1.1.1.1.1.32.2 Post-Conditions

On success, an *EPPBalanceInfoResp* is returned.

1.1.1.1.1.32.3 Exceptions

An *EPPCommandException* will be returned that contains the *EPPResponse* returned from the Server. The *getResponse()* method returns the associated *EPPResponse*. If the exception is thrown before reading the Server response, than *getResponse()* will return *null*.

1.1.1.1.1.32.4 Sample Code

The following example shows the steps of performing a Balance info using the *EPPBalance* client interface and the *sendInfo()* method:

```
EPPBalanceInfoResp response;

try {
        EPPBalance balance = new EPPBalance(session);


        balance.setTransId("ABC-12345");

        response = balance.sendInfo();

        System.out.println( "Credit Limit: " +
                response.getCreditLimit() );

        System.out.println( "Balance: " +
                response.getBalance() );

        System.out.println( "Available Credit: " +
                response.getAvailableCredit() );

        System.out.println( "Credit Threshold (type, value): " +
                response.getCreditThreshold().getType() + "," +
                response.getCreditThreshold().getValue());
}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

13.14.6 EmailFwd Mapping

To be filled in. Please refer to the JavaDoc for detail on the EmailFwd Mapping support.

13.14.7 DefReg Mapping

To be filled in. Please refer to the JavaDoc for detail on the DefReg Mapping support.

13.14.8 NameWatch Mapping

To be filled in. Please refer to the JavaDoc for detail on the NameWatch Mapping support.

13.14.9 IDN Table Mapping

This section is intended to provide users of the Extensible Provisioning Protocol (EPP) Software Development Kit (SDK) with an overview of the Internationalized Domain Name (IDN) Table Mapping additions to the SDK. This document includes the following IDN Table information:

3. Definition of the IDN Table SDK files (i.e. library, schema)
4. Description of the IDN Table interface classes, including the pre-conditions, the post-conditions, the exceptions, the EPP status codes, and sample code of each of the action methods.

The SDK provides detailed interface information in HTML Javadoc format. This document does not duplicate the detailed interface information contained in the HTML Javadoc. Descriptions are provided of the main IDN Table interface elements, the pre-conditions, the post-conditions, and example code.

It is assumed that the reader has reviewed the associated EPP specifications and has a general understanding of the EPP concepts. Much of the EPP details are encapsulated in the SDK, but having a solid understanding of the EPP concepts will help in effectively using the SDK.

13.14.9.1 IDN Table Tests

The Verisign source distribution contains one test program for the IDN Table EPP Mapping. The tests are located in the idntable/java directory in *com.verisign.epp.interfaces* package. The following table describes the test files:

Directory	Description
EPPIdnTableTst.java	This is a sample program demonstrating the use of the EPPIdnTable class.

13.14.9.2 IDN Table Packages

The IDN Table portion of the Verisign Bundle EPP SDK consists of sub-packages and class additions to existing SDK packages. Figure 14 - Balance Packages provides an overview of the primary SDK packages.

Package	Description
com.verisign.epp.codec.idntable	IDN Table Encoder/Decoder package. All of the detail of encoding and decoding the IDN Table EPP messages are in this package. The *EPPIdnTableFactory* must be added to the EPP.MapFactories configuration parameter using the full package and class name.

com.verisign.epp.framework	Addition of IDN Table EPP Server Framework classes used by the Stub Server.
com.verisign.epp.serverstub	Addition of the *IdnTableHandler* class used to implement the EPP IDN Table Stub Server behavior. This class must be added to the EPP.ServerEventHandlers configuration parameter using the full package and class names.
com.verisign.epp.interfaces	This package contains the IDN Table client interface classes. These classes provide the primary interfaces that map to the commands and objects of the IDN Table EPP Mapping.

Figure 16 – IDN Table Packages

13.14.9.3 IDN Table XML Schema files

The IDN Table EPP Mapping is defined using XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them. The following table gives a brief description of these schema files:

File Name	Location	Description
idnTable-1.0.xsd	schemas	IDN Table XML Schema. This file must reside in the current directory of the client application and the EPP Stub Server.

Figure 17 – IDN Table Schema Files

13.14.9.4 IDN Table Client Interfaces

The IDN Table portion of the Verisign Bundle EPP SDK contains client interface classes for the IDN Table EPP Mapping. The interfaces provide mechanisms for getting the IDN Table information. The following sections describe the client interface classes, supporting classes and their respective purposes.

13.14.9.4.1 IDN Table Interface

The IDN Table interface, *EPPIdnTable*, is located in the *com.verisign.epp.interfaces* package. This interface is used to get the IDN Table information utilizing the forms defined in the IDN Table EPP Mapping.

The *EPPIdnTable* interface has the following relevant methods:

Return Value	Parameters
	`EPPIdnTable(EPPSession aSession)` This is the constructor method and it requires an EPP session object to be passed that has been authenticated (e.g. logged in).
`EPPIdnTableCheckResp`	`sendDomainCheck()` Sends an IDN Table Check Command in Domain Check Form. Requires at least one domain name set with the *addDomain(String)* method. Optionally the client transaction identifier set with the *setTransId(String)* method.
`EPPIdnTableCheckResp`	`sendTableCheck()` Sends an IDN Table Check Command in Table Check Form. Requires at least one table identifier set with the *addTable(String)* method. Optionally the client transaction identifier set with the *setTransId(String)* method.
`EPPIdnTableResp`	`sendDomainInfo()` Sends an IDN Table Info Command in Domain Info Form. Requires one domain name set with the *addDomain(String)* method. Optionally the client transaction identifier set with the *setTransId(String)* method.
`EPPIdnTableResp`	`sendTableInfo()` Sends an IDN Table Info Command in Table Info Form. Requires one table identifier set with the *addTable(String)* method. Optionally the client transaction identifier set with the *setTransId(String)* method.
`EPPIdnTableResp`	`sendListInfo()` Sends an IDN Table Info Command in List Info Form.

	Optionally the client transaction identifier set with the *setTransId(String)* method.

The methods on the *EPPIdnTable* takes request data that will be sent to the server. The methods will return a response from the Server and will throw an exception if any error occurs. If the exception is associated with an error response from the Server, then the response can be retrieved from the exception with a call to *getResponse()*. The following sections describe and provide sample code for the method and the *EPPIdnTable* constructor.

1.1.1.1.1.33 EPPIdnTable () Constructor

The *EPPIdnTable* constructor requires that an authenticated *EPPSession* object be passed upon creation. Once created, the *EPPIdnTable* object can perform multiple functions without reinitializing the *EPPSession* object. For example, you can use the same initialized *EPPIdnTable* object to get the IDN Table information with any of the *send()* methods.

1.1.1.1.1.33.1 Pre-Conditions

An authenticated session has been successfully established with an *EPPSession*.

1.1.1.1.1.33.2 Post-Conditions

The *EPPIdnTable* instance is ready for the execution of one or more operations.

1.1.1.1.1.33.3 Exceptions

None

1.1.1.1.1.33.4 Sample Code

The following example shows the steps of initializing an *EPPSession*, then using the *EPPSession* to initialize the *EPPIdnTable* interface.

```
EPPSession session = new EPPSession();

// optional
session.setTransId("ABC-12345-XYZ");
session.setVersion("1.0");
session.setLang("en");

// required
session.setClientID("ClientXID");
session.setPassword("ClientXPass");

try {
        session.initSession();
}
catch (EPPCommandException ex) {
```

```
        ex.printStackTrace();
        System.exit(1);
}

EPPIdnTable idnTable = new EPPIdnTable(session);
```

13.14.10 China Name Verification Mapping

This section is intended to provide users of the Extensible Provisioning Protocol (EPP) Software Development Kit (SDK) with an overview of the China Name Verification Mapping additions to the SDK. This document includes the following China Name Verification information:

1. Definition of the China Name Verification SDK files (i.e. library, schema)
2. Description of the China Name Verification interface classes, including the pre-conditions, the post-conditions, the exceptions, the EPP status codes, and sample code of each of the action methods.

The SDK provides detailed interface information in HTML Javadoc format. This document does not duplicate the detailed interface information contained in the HTML Javadoc. Descriptions are provided of the main China Name Verification interface elements, the pre-conditions, the post-conditions, and example code.

It is assumed that the reader has reviewed the associated EPP specifications and has a general understanding of the EPP concepts. Much of the EPP details are encapsulated in the SDK, but having a solid understanding of the EPP concepts will help in effectively using the SDK.

13.14.10.1 China Name Verification Tests

The Verisign source distribution contains one test program for the China Name Verification EPP Mapping. The tests are located in the vsp/java directory in *com.verisign.epp.interfaces* package. The following table describes the test files:

Directory	Description
EPPNameVerificationTst.java	This is a sample program demonstrating the use of the EPPNameVerification class.

13.14.10.2 China Name Verification Packages

The China Name Verification portion of the Verisign Bundle EPP SDK consists of sub-packages and class additions to existing SDK packages. Figure 14 - Balance Packages provides an overview of the primary SDK packages.

Package	Description
com.verisign.epp.codec.nv	China Name Verification Encoder/Decoder package. All of the detail of encoding and decoding the China Name Verification EPP messages are in this package.

	The *EPPNameVerificationMapFactory* must be added to the EPP.MapFactories configuration parameter using the full package and class name.
com.verisign.epp.framework	Addition of China Name Verification EPP Server Framework classes used by the Stub Server.
com.verisign.epp.serverstub	Addition of the *NameVerificationHandler* class used to implement the EPP China Name Verification Stub Server behavior. This class must be added to the EPP.ServerEventHandlers configuration parameter using the full package and class names.
com.verisign.epp.interfaces	This package contains the China Name Verification client interface classes. These classes provide the primary interfaces that map to the commands and objects of the China Name Verification EPP Mapping.

Figure 18 – China Name Verification Packages

13.14.10.3 China Name Verification XML Schema files

The China Name Verification EPP Mapping is defined using XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them. The following table gives a brief description of these schema files:

File Name	Location	Description
nv-1.0.xsd	schemas	China Name Verification XML Schema. This file must reside in the current directory of the client application and the EPP Stub Server.

Figure 19 – China Name Verification Schema Files

13.14.10.4 China Name Verification Client Interfaces

The China Name Verification portion of the Verisign Bundle EPP SDK contains client interface classes for the China Name Verification EPP Mapping. The interfaces provide mechanisms for sending China Name Verification transform and query commands. The following sections describe the client interface classes, supporting classes and their respective purposes.

13.14.10.4.1 China Name Verification Interface

The China Name Verification interface, *EPPNameVerification*, is located in the *com.verisign.epp.interfaces* package. This interface is used to get the China Name Verification information utilizing the forms defined in the China Name Verification EPP Mapping.

The *EPPNameVerification* interface has the following relevant methods:

Return Value	Parameters
	`EPPNameVerification(EPPSession aSession)` This is the constructor method and it requires an EPP session object to be passed that has been authenticated (e.g. logged in).
`EPPNameVerificationCheckResp`	`sendCheck()` Sends a Name Verification Check Command to the server. Requires at least one domain label set with the *addLabel(String)* method. Optionally the client transaction identifier set with the *setTransId(String)* method.
`EPPNameVerificationInfoResp`	`sendInfo()` Sends a Name Verification Info Command to the server. Requires the verification code with the *setCode(String)* method and the info type with the *setType(EPPNameVerificationInfoCmd.Type)* method . Optionally the client transaction identifier set with the *setTransId(String)* method or set the authorization information with the *setAuthInfo(String)* method.
`EPPNameVerificationCreateResp`	`sendCreate()` Sends the Name Verification Create Command for either a Domain Name Verification (DNV) or Real Name Verification (RNV) object. Requires either the Domain Name Verification (DNV) information to be set with *setDnv(EPPDomainNameVerification)* or the Real Name Verification (RNV) information to be set with *setRnv(EPPRealNameVerification)*, along with the authorization information with *setAuthInfo(String)*. Optionally the client transaction identifier set with the *setTransId(String)* method.
`EPPResponse`	`sendUpdate()` Sends the Name Verification Update Command to update the authorization information for a Name Verification object.

	Requires the verification code with the *setCode(String)* method and the new authorization information with the *setAuthInfo(String)* method. Optionally the client transaction identifier set with the *setTransId(String)* method.

The methods on the *EPPNameVerification* takes request data that will be sent to the server. The methods will return a response from the Server and will throw an exception if any error occurs. If the exception is associated with an error response from the Server, then the response can be retrieved from the exception with a call to *getResponse()*. The following sections describe and provide sample code for the method and the *EPPNameVerification* constructor.

1.1.1.1.1.34 EPPNameVerification () Constructor

The *EPPNameVerification* constructor requires that an authenticated *EPPSession* object be passed upon creation. Once created, the *EPPNameVerification* object can perform multiple functions without reinitializing the *EPPSession* object. For example, you can use the same initialized *EPPNameVerification* object to send any of the China Name Verification commands with the *send()* methods.

1.1.1.1.1.34.1 Pre-Conditions

An authenticated session has been successfully established with an *EPPSession*.

1.1.1.1.1.34.2 Post-Conditions

The *EPPNameVerification* instance is ready for the execution of one or more operations.

1.1.1.1.1.34.3 Exceptions

None

1.1.1.1.1.34.4 Sample Code

The following example shows the steps of initializing an *EPPSession*, then using the *EPPSession* to initialize the *EPPNameVerification* interface.

```
EPPSession session = new EPPSession();

// optional
session.setTransId("ABC-12345-XYZ");
session.setVersion("1.0");
session.setLang("en");

// required
session.setClientID("ClientXID");
session.setPassword("ClientXPass");
```

```
try {
        session.initSession();
}
catch (EPPCommandException ex) {
        ex.printStackTrace();
        System.exit(1);
}

EPPNameVerification nameVerification = new EPPNameVerification(session);
```

13.14.11 Organization Mapping

This section is intended to provide users of the Extensible Provisioning Protocol (EPP) Software Development Kit (SDK) with an overview of the Organization Mapping additions to the SDK. This document includes the following Organization information:

3. Definition of the Organization SDK files (i.e. library, schema)
4. Description of the Organization interface classes, including the pre-conditions, the post-conditions, the exceptions, the EPP status codes, and sample code of each of the action methods.

The SDK provides detailed interface information in HTML Javadoc format. This document does not duplicate the detailed interface information contained in the HTML Javadoc. Descriptions are provided of the main Organization interface elements, the pre-conditions, the post-conditions, and example code.

It is assumed that the reader has reviewed the associated EPP specifications and has a general understanding of the EPP concepts. Much of the EPP details are encapsulated in the SDK, but having a solid understanding of the EPP concepts will help in effectively using the SDK.

13.14.11.1 Organization Tests

The Verisign source distribution contains one test program for the Organization EPP Mapping. The tests are located in the vsp/java directory in *com.verisign.epp.interfaces* package. The following table describes the test files:

Directory	Description
EPPOrgTst.java	This is a sample program demonstrating the use of the EPPOrg class.

13.14.11.2 Organization Packages

The Organization portion of the Verisign Bundle EPP SDK consists of sub-packages and class additions to existing SDK packages. Figure 14 - Balance Packages provides an overview of the primary SDK packages.

Package	Description
com.verisign.epp.codec.org	Organization Encoder/Decoder package. All of the detail of encoding and decoding the Organization EPP messages are in this package.

	The *EPPOrgMapFactory* must be added to the EPP.MapFactories configuration parameter using the full package and class name.
com.verisign.epp.framework	Addition of Organization EPP Server Framework classes used by the Stub Server.
com.verisign.epp.serverstub	Addition of the *OrgHandler* class used to implement the EPP Organization Stub Server behavior. This class must be added to the EPP.ServerEventHandlers configuration parameter using the full package and class names.
com.verisign.epp.interfaces	This package contains the Organization client interface classes. These classes provide the primary interfaces that map to the commands and objects of the Organization EPP Mapping.

Figure 20 – Organization Packages

13.14.11.3 Organization XML Schema files

The Organization EPP Mapping is defined using XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them. The following table gives a brief description of these schema files:

File Name	Location	Description
org-1.0.xsd	schemas	Organization Mapping XML Schema. This file must reside in the current directory of the client application and the EPP Stub Server.

Figure 21 – Organization Schema Files

13.14.11.4 Organization Client Interfaces

The Organization portion of the Verisign Bundle EPP SDK contains client interface classes for the Organization EPP Mapping. The interface provides a mechanism for sending Organization transform and query commands. The following sections describe the client interface classes, supporting classes and their respective purposes.

13.14.11.4.1 Organization Interface

The Organization interface, *EPPOrg*, is located in the *com.verisign.epp.interfaces* package. This interface is used to get the send Organization transform and query commands defined in the Organization EPP Mapping.

The *EPPOrg* interface has the following relevant methods:

Return Value	Parameters
	`EPPOrg(EPPSession aSession)` This is the constructor method and it requires an EPP session object to be passed that has been authenticated (e.g. logged in).
`EPPOrgCheckResp`	`sendCheck()` Sends a Organization Check Command to the server. Requires at least one organization identifier set with the *addOrgId(String)* method. Optionally the client transaction identifier set with the *setTransId(String)* method.
`EPPOrganizationInfoResp`	`sendInfo()` Sends a Organization Info Command to the server. Requires the organization identifier with the *addOrgId(String)* method. Optionally the client transaction identifier set with the *setTransId(String)* method.
`EPPOrganizationCreateResp`	`sendCreate()` Sends the Organization Create Command for a organization object. Requires the organization identifier to be set with *addOrgId(String)* and at least one role be set with *addRole(EPPOrgRole)*. Optionally the client transaction identifier set with the *setTransId(String)* method along with the other reseller attributes.
`EPPResponse`	`sendDelete()` Sends the Organization Delete Command to delete the organization object. Requires the organization identifier to be set with *addOrgId(String)*. Optionally the client transaction identifier set with the *setTransId(String)* method along with the other reseller attributes.

EPPResponse	sendUpdate() Sends the Organization Update Command to update the organization object. Requires the organization identifier to be set with *addOrgId(String)*. Optionally the client transaction identifier set with the *setTransId(String)* method along with the other reseller attributes.

The methods on the *EPPOrg* takes request data that will be sent to the server. The methods will return a response from the Server and will throw an exception if any error occurs. If the exception is associated with an error response from the Server, then the response can be retrieved from the exception with a call to *getResponse()*. The following sections describe and provide sample code for the method and the *EPPOrg* constructor.

1.1.1.1.1.35 EPPOrg() Constructor

The *EPPOrg* constructor requires that an authenticated *EPPSession* object be passed upon creation. Once created, the *EPPOrg* object can perform multiple functions without reinitializing the *EPPSession* object. For example, you can use the same initialized *EPPOrg* object to send any of the Organization commands with the *send()* methods.

1.1.1.1.1.35.1 Pre-Conditions

An authenticated session has been successfully established with an *EPPSession*.

1.1.1.1.1.35.2 Post-Conditions

The *EPPOrganization* instance is ready for the execution of one or more operations.

1.1.1.1.1.35.3 Exceptions

None

1.1.1.1.1.35.4 Sample Code

The following example shows the steps of initializing an *EPPSession*, then using the *EPPSession* to initialize the *EPPOrganization* interface.

```
EPPSession session = new EPPSession();

// optional
session.setTransId("ABC-12345-XYZ");
session.setVersion("1.0");
session.setLang("en");
```

```
// required
session.setClientID("ClientXID");
session.setPassword("ClientXPass");

try {
        session.initSession();
}
catch (EPPCommandException ex) {
        ex.printStackTrace();
        System.exit(1);
}

EPPOrg org = new EPPOrg(session);
```

13.14.12 Maintenance Mapping

The Maintenance Mapping in "Registry Maintenance Notifications for the Extensible Provisioning Protocol (EPP)" describes a mapping for maintenance notifiications.

13.14.12.1 Maintenance Mapping Packages

The Maintenance Mapping consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the Validate Extension packages.

Package	Description
com.verisign.epp.codec.maintenance	Maintenance Mapping EPP Encoder/Decoder package. All of the detail of encoding and decoding the Maintenance Mapping EPP messages are encapsulated in this package. The *com.verisign.epp.codec.maintenance.v1_0.EPPValidateMapFactory* must be added to the *EPP.MapFactories* configuration parameter to support RFC 9167 .
com.verisign.epp.interfaces	Includes *com.verisign.epp.interfaces.maintenance.v1_0.EPPMaintenanceTst* test class for testing the Maintenance Mapping against the Stub Server for RFC 9167.
com.verisign.epp.serverstub	For the Maintenance Mapping to be supported by the Stub Server, the *com.verisign.epp.serverstub.maintenance.v1_0.MaintenanceHandler* or later must be added to the *EPP.*ServerEventHandlers configuration parameter. Also, the *com.verisign.epp.serverstub.maintenance.v1_0.MaintenancePollHandler* must be added to the EPP.PollHandlers configuration parameter.

13.14.12.2 Maintenance Mapping XML Schema Files

The Maintenance Mapping is defined using an XML schema file and is dependent on a set of XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
mMaintenance-1.0.xsd	schemas	RFC 9167 Maintenance Mapping XML Schema

13.14.13 Change Mapping

The EPP Change support provisioning a Change Request that can be linked to other object commands using the Change Extension.

13.14.13.1 Change Mapping Packages

The Change Mapping consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the extension packages.

Package	Description
com.verisign.epp.codec.change	Use of Change Mapping EPP Encoder/Decoder package. Contains the *EPPChangeMapFactory* class. The *com.verisign.epp.codec.change.EPPChangeMapFactory* must be added to the *EPP.MapFactories* configuration parameter to support the Change Mapping.
com.verisign.epp.interfaces	Includes the *com.verisign.epp.interfaces.EPPChange* class for the Change Mapping client interface and the *com.verisign.epp.interfaces.EPPChangeTst* for testing the use of the Change Mapping against the Stub Server.
com.verisign.epp.serverstub	For the Change Mapping Extension to be supported by the Stub Server, the *com.verisign.epp.serverstub.ChangeHandler* class or *com.verisign.epp.serverstub.RZChangeHandler* must be added to the *EPP.*ServerEventHandlers configuration parameter. The *ChangeHandler* works with the interfaces client tests and the *RZChangeHandler* simulates a persistent change handler along with the *com.verisign.epp.serverstub.RZDomainHandler* and *com.verisign.epp.serverstub.RZHostHandler* that leverage the Change Extension.

13.15 Extensions

13.15.1 NamestoreExt Extension

The NamestoreExt is used for command routing to a logical service or registry using a sub-product property that is referred to as the SubProductID. Both Namestore (CTLD) and the COMNET require the use of the NameStoreExt to uniquely identify the target registry or service. For example, when a host is created, the NamestoreExt element will specify the particular registry at which the host is created. Currently, the convention used for the SubProductID is to use the A-Label TLD, as in "CC" for the .CC TLD or "COM" for the .COM TLD.

13.15.1.1 EPPNamestoreExtNamestoreExt

The *EPPNamestoreExtNamestoreExt* class is used with the *addExtension()* method for specifying the subProduct. The constructor or the *setSubProductID(java.lang.String)* should be used for setting the SubProductID value.

Please refer to the following sections for sample code demonstrating the use of the *EPPNamestoreExtNamestoreExt* class.

13.15.2 Whois Info Extension

The Whois Info Extension defined in "Extensible Provisioning Protocol Extension Mapping: Whois Info" is used to get additional domain information that is provided in the Whois Server including the following attributes:

1. Registrar Name – Full name of the sponsoring Registrar
2. Whois Server – Whois Server of the sponsoring Registrar
3. Referral URL – Referral URL of the sponsoring Registrar
4. IRIS Server – IRIS Server of the sponsoring Registrar

To specify that the additional information is desired, either an *com.verisign.epp.codec.whois.EPPWhoisInf* instance needs to added to the *com.verisign.epp.interfaces.EPPDomain* via the *addExtension(EPPCodecComponent)* method or via the *com.verisign.epp.interfaces.NSDomain.setWhoisInf(boolean)* method. If the flag is set to *true*, than the *com.verisign.epp.codec.whois.EPPWhoisInfData* instance can be retrieved from the returned *com.verisign.epp.codec.domain.EPPDomainInfoResp* via the *getExtension(Class)* method.

13.15.3 SecDNS Extension

The SecDNS Extension is used for provisioning and management of DNS security extensions in a shared central repository. This extension defines additional elements for EPP **<create>, <update>** commands and also for the EPP **<info>** response. There are two versions of the SecDNS Extension supported that include:

1. secDNS-1.0 – This is the term that refers to "RFC 4310 – EPP DNS Security Extensions Mapping". The classes contained in the *com.verisign.epp.codec.secdnsext* package were moved to the *com.verisign.epp.codec.secdnsext.v10* package to support more than one version of the SecDNS Extension.
2. secDNS-1.1 – This is the term that refers to "RFC 5910 – EPP DNS Security Extensions Mapping" that deprecates "RFC 4310 – EPP DNS Security Extensions Mapping". It is recommended that secDNS-1.1 be used. The secDNS-1.1 classes are contained in the *com.verisign.epp.codec.secdnsext.v11* package. There are some fundamental changes included in secDNS-1.1 that should be reviewed if the client is migrating from secDNS-1.0.

There are two approaches to setting the SecDNS Extension with a domain create or update command. The first approach sets the *com.verisign.epp.codec.secdnsext.v10.EPPSecDNSExtCreate* or *com.verisign.epp.codec.secdnsext.v10.EPPSecDNSExtUpdate* instances for secDNS-1.0 or sets the *com.verisign.epp.codec.secdnsext.v11.EPPSecDNSExtCreate* or *com.verisign.epp.codec.secdnsext.v11.EPPSecDNSExtUpdate* instances for secDNS-1.1 with the *com.verisign.epp.interfaces.EPPDomain.addExtension(EPPCodecComponent)* method. The second approach is to use the SecDNS Extension convenience methods with the *com.verisign.epp.interfaces.NSDomain* interface described below.

Some of the *com.verisign.epp.namestore.interfaces.NSDomain* methods support both secDNS1.0 and secDNS-1.1 by using reflection of the first element contained in the passed in *List* parameter. The *List* parameter contains *com.verisign.epp.codec.secdnsext.v10.EPPSecDNSExtDsData* instances for secDNS-1.0 and *com.verisign.epp.codec.secdnsext.v11.EPPSecDNSExtDsData* instances for secDNS-1.1. The exception to this is the *setSecDNSUpdateForRem(List, Boolean*) method where the *List* parameter contains *Integer* instances for secDNS-1.0 and *com.verisign.epp.codec.secdnsext.v11.EPPSecDNSExtDsData* instances for secDNS-1.1. The methods include the following:

1. *setSecDNSCreate(List aDsData)* – Set the DS to include with the *sendCreate()*.
2. *setSecDNSUpdateForAdd(List aAddDsData, boolean aUrgent)* – Set the DS to add along with the urgent flag value. For secDNS-1.1 it is recommended to use

the *setSecDNSUpdate(List aAddDsData, List aRemDsData)* method instead. The *setSecDNSUpdateForAdd(List aAddDsData, boolean aUrgent)* method cannot be used in combination with any other *setSecDNSUpdate* methods.

3. *setSecDNSUpdateForRem(List aRemDsData, boolean aUrgent)* – Set the DS to remove along with the urgent flag value. For secDNS-1.1 it is recommended to use the *setSecDNSUpdate(List aAddDsData, List aRemDsData)* method instead. The *setSecDNSUpdateForRem(List aRemDsData, boolean aUrgent)* method cannot be used in combination with any other *setSecDNSUpdate* methods.

One method that only supports secDNS-1.1 is the following:

1. *setSecDNSUpdate(List aAddDsData, List aRemDsData)* –The method can be used to add, remove, remove all, and replace all DS. The constant *NSDomain.REM_ALL_DS* can be used for the *aRemDsData* parameter to remove all DS and to replace all DS by also including a non-null, non-empty *aAddDsData* parameter. *setSecDNSUpdate(List aAddDsData, List aRemDsData)* method cannot be used in combination with any other *setSecDNSUpdate* methods. The *aUrgent* parameter is not included with this method since the Verisign servers do not support setting the urgent flag to true.

One method that only supports secDNS-1.0 is the following:

1. *setSecDNSUpdateForChg(List aChgDsData, boolean aUrgent)* – This method replaces all of the DS according to secDNS-1.0. There is a different approach taken for secDNS-1.1 to replace all of the DS, so the use of the <secDNS:chg> with a list of DS is specific to secDNS-1.0.

13.15.3.1 Sample Code

The following is a sample of setting DS data on a domain create using secDNS-1.0.

```
NSDomain theDomain = new NSDomain(session);
theDomain.addDomainName("example.com");
theDomain.setSubProductID(NSSubProduct.COM);
theDomain.setAuthString("ClientX");

// Add DS
List dsDataList = new ArrayList();
dsDataList.add(new
com.verisign.epp.codec.secdnsext.v10.EPPSecDNSExtDsData(12345,
                  EPPSecDNSAlgorithm.DSA,
                  EPPSecDNSExtDsData.SHA1_DIGEST_TYPE,
                  "49FD46E6C4B45C55D4AC"));
theDomain.setSecDNSCreate(dsDataList);
```

```
EPPDomainCreateResp theResponse = theDomain.sendCreate();
```

The following is a sample of setting DS data on a domain create using secDNS-1.1.

```
NSDomain theDomain = new NSDomain(session);
theDomain.addDomainName("example.com");
theDomain.setSubProductID(NSSubProduct.COM);
theDomain.setAuthString("ClientX");

// Add DS
List dsDataList = new ArrayList();
dsDataList.add(new
com.verisign.epp.codec.secdnsext.v11.EPPSecDNSExtDsData(12345,
                  EPPSecDNSAlgorithm.DSA,
                  EPPSecDNSExtDsData.SHA1_DIGEST_TYPE,
                  "49FD46E6C4B45C55D4AC"));
theDomain.setSecDNSCreate(dsDataList);

EPPDomainCreateResp theResponse = theDomain.sendCreate();
```

The following is a sample of adding DS data on a domain update using secDNS-1.0.

```
NSDomain theDomain = new NSDomain(session);
theDomain.addDomainName("example.com");
theDomain.setSubProductID(NSSubProduct.COM);

// Add DS
List dsDataList = new ArrayList();
dsDataList.add(new
com.verisign.epp.codec.secdnsext.v10.EPPSecDNSExtDsData(12345,
                  EPPSecDNSAlgorithm.DSA,
                  EPPSecDNSExtDsData.SHA1_DIGEST_TYPE,
                  "49FD46E6C4B45C55D4AC"));
theDomain.setSecDNSUpdateForAdd(dsDataList);

EPPDomainCreateResp theResponse = theDomain.sendUpdate();
```

The following is a sample of adding and removing DS data on a domain update using secDNS-1.1.

```
NSDomain theDomain = new NSDomain(session);
theDomain.addDomainName("example.com");
theDomain.setSubProductID(NSSubProduct.COM);

// Add DS
List addDsDataList = new ArrayList();
addDsDataList.add(new
com.verisign.epp.codec.secdnsext.v11.EPPSecDNSExtDsData(12345,
                  EPPSecDNSAlgorithm.DSA,
                  EPPSecDNSExtDsData.SHA1_DIGEST_TYPE,
                  "49FD46E6C4B45C55D4AC"));
```

```
List remDsDataList = new ArrayList();
remDsDataList.add(new
com.verisign.epp.codec.secdnsext.v11.EPPSecDNSExtDsData(12345,
                  EPPSecDNSAlgorithm.DSA,
                  EPPSecDNSExtDsData.SHA1_DIGEST_TYPE,
                  "38EC35D5B3A34B44C39B "));
theDomain.setSecDNSUpdate(addDsDataList, remDsDataList);

EPPDomainCreateResp theResponse = theDomain.sendUpdate();
```

The following is a sample of replacing all DS data by removing all and then adding a list of new DS using secDNS-1.1.

```
NSDomain theDomain = new NSDomain(session);
theDomain.addDomainName("example.com");
theDomain.setSubProductID(NSSubProduct.COM);

// Add DS
List addDsDataList = new ArrayList();
addDsDataList.add(new
com.verisign.epp.codec.secdnsext.v11.EPPSecDNSExtDsData(12345,
                  EPPSecDNSAlgorithm.DSA,
                  EPPSecDNSExtDsData.SHA1_DIGEST_TYPE,
                  "49FD46E6C4B45C55D4AC"));
theDomain.setSecDNSUpdate(addDsDataList, NSDomain.REM_ALL_DS);

EPPDomainCreateResp theResponse = theDomain.sendUpdate();
```

13.15.4 COA Extension

The COA Extension is used for provisioning and management of Client Object Attribute extensions in a shared central repository. This extension defines additional elements for EPP <create>, <update> commands and also for the EPP <info> response.

There are two approaches to setting the COA Extension with a domain create or update command. The first approach sets the *com.verisign.epp.codec.coaext.EPPCoaExtCreate* or *com.verisign.epp.codec.coaext.EPPCoaExtUpdate* instances with the *com.verisign.epp.interfaces.EPPDomain.addExtension(EPPCodecComponent)* method. The second approach is to use the COA Extension convenience methods with the *com.verisign.epp.interfaces.NSDomain* interface described here.

1. *setCoaCreate(List aAttrs)* – Set the COAs to include with the *sendCreate()*.

Code sample:

```
NSDomain theDomain = new NSDomain(session);
theDomain.addDomainName("example.com");
theDomain.setSubProductID(NSSubProduct.COM);
theDomain.setAuthString("ClientX");

// Client Object Attributes to be added
EPPCoaExtAttr attr = new EPPCoaExtAttr( "KEY1", "value1"
);
List attrList = new ArrayList();
attrList.add(attr);
theDomain.setCoaCreate(attrList);


EPPDomainCreateResp theResponse = theDomain.sendCreate();
```

2. *setCoaUpdateForPut(List aAttrs)* – Set the list of key / value pairs specifying the COAs to add or update.

Code sample:

```
NSDomain theDomain = new NSDomain(session);
theDomain.addDomainName("example.com");
theDomain.setSubProductID(NSSubProduct.COM);
theDomain.setAuthString("ClientX");

// Client Object Attributes to be added
EPPCoaExtAttr attr = new EPPCoaExtAttr( "KEY1", "value1"
);
List attrList = new ArrayList();
attrList.add(attr);
theDomain.setCoaUpdateForPut(attrList);


EPPDomainCreateResp theResponse = theDomain.sendUpdate();
```

3. *setCoaUpdateForRem(List aKeys)* – Set the list of keys identifying which existing COAs to remove.

Code sample:

```
NSDomain theDomain = new NSDomain(session);
theDomain.addDomainName("example.com");
theDomain.setSubProductID(NSSubProduct.COM);
theDomain.setAuthString("ClientX");

// Client Object Attributes to be removed
EPPCoaExtKey key = new EPPCoaExtKey("KEY1");
List attrList = new ArrayList();
attrList.add(key);
theDomain.setCoaUpdateForRem(attrList);


EPPDomainCreateResp theResponse = theDomain.sendUpdate();
```

13.15.5 Launch Extension

The Launch Extension defined in "Launch Phase Mapping for the Extensible Provisioning Protocol (EPP)" is used during the launch phases of new TLD's. During the "sunrise" launch phase, trademark information is passed using the definitions in the "Mark and Signed Mark Objects Mapping". The Launch Extension includes extensions to the Domain Check Command, Domain Info Command, Domain Create Command, Domain Update Command, and Domain Delete Command. The majority of the SDK support for the Launch Extension is handled by using the Launch CODEC classes, in the *com.verisign.epp.codec.launch* package, with the *com.verisign.epp.interfaces.EPPDomain.addExtension(EPPCodecComponent)* method or the *com.verisign.epp.namestore.interfaces.NSDomain.addExtension(EPPCodecComponent)* method. The *com.verisign.epp.interfaces.EPPLaunch* interfaces class was created to simplify sending the Launch Check Command (Claims Check Form or Availability Check Form).

13.15.5.1 Launch Extension Packages

The Launch Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the Launch Extension packages.

Package	Description
com.verisign.epp.codec.launch	Launch Extension EPP Encoder/Decoder package. All of the detail of encoding and decoding the Launch Extension EPP messages are encapsulated in this package. The *com.verisign.epp.codec.launch.EPPLaunchExtFactory* must be added to the *EPP.CmdRspExtensions* configuration parameter.
com.verisign.epp.interfaces	Addition of the *EPPLaunch* Client Interface class, which provides a simplified interface for sending the Claims Check Command.
com.verisign.epp.serverstub	Addition of the *com.verisign.epp.serverstub.LaunchDomainHandler* class and the *com.verisign.epp.serverstub.LaunchPollHandler* used to implement the EPP Launch Stub Server behavior. The *com.verisign.epp.serverstub.LaunchDomainHandler* class must be added to the *EPP.ServerEventHandlers* configuration parameter and the *com.verisign.epp.serverstub.LaunchPollHandler* class must be added to the *EPP.PollHandlers* configuration parameter to simulate a server that supports the Launch Extension.

13.15.5.2 Launch XML Schema Files

The Launch Extension is defined using an XML schema file and is dependent on a set of XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
launch-1.0.xsd	schemas	Launch Extension XML Schema. This XML Schema is dependent on the mark-1.0.xsd and the signedMark-1.0.xsd.
mark-1.0.xsd	schemas	Trademark definition XML Schema.
signedMark-1.0.xsd	schemas	Signed Mark and Encoded Signed Mark XML Schema. This XML Schema is dependent on mark-1.0.xsd and xmldsig-core-schema.xsd.
xmldsig-core-schema.xsd	schemas	XML Signature (xmldsig) XML Schema.

13.15.5.3 Launch Client Interface

The Launch Extension is an extension to the Domain Object and so the Domain Client Interface classes that include *com.verisign.epp.interfaces.EPPDomain* and *com.verisign.epp.namestore.interfaces.NSDomain* are used along with the Launch Extension specific *com.verisign.epp.interfaces.EPPLaunch* class for the Claims Check Command. A set of examples is provided for various Launch Extension cases in the following sections.

13.15.5.3.1 sendCheck() Method

The Launch Extension includes two forms of the Check Command, which include the Claims Check Form and the Availability Check Form. Both forms may be handled using the *com.verisign.epp.interfaces.EPPLaunch.sendCheck()* method.

"Figure 22 - Launch Claims Check Example" shows an example of executing a Launch Extension Claims Check Command using the *com.verisign.epp.interfaces.EPPLaunch.sendCheck()* method.

Figure 22 - Launch Claims Check Example

```
EPPResponse response;

try {
        EPPLaunch launch = new EPPLaunch(session);
```

```
        launch.setTransId("ABC-12345");
        launch.addDomainName("example1.tld");
        launch.setPhase(EPPLaunch.PHASE_CLAIMS);

        response = launch.sendCheck();

        if (response.hasExtension(EPPLaunchChkData.class)) {
                EPPLaunchChkData ext = (EPPLaunchChkData)
response.getExtension(EPPLaunchChkData.class);

                List<EPPLaunchCheckResult> results = ext.getCheckResults();
                for (EPPLaunchCheckResult result : results) {
                        if (result.isExists()) {
                                System.out.println(result.getName() + ", mark
exists, claimsKey = [" + result.getClaimKey() + "]");
                }
                else {
                        System.out.println(result.getName() + ", mark DOES NOT
exist");
        }

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

"Figure 23 - Launch Availability Check Example" shows an example of executing a Launch Extension Availability Check Command using the *com.verisign.epp.interfaces.EPPLaunch.sendCheck()* method for the custom "idn-releases" phase.

Figure 23 - Launch Availability Check Example

```
EPPDomainCheckResp response;

try {
        EPPLaunch launch = new EPPLaunch(session);
```

```
        launch.setTransId("ABC-12345");
        launch.addDomainName("example1.tld");
        launch.setPhase(EPPLaunch.PHASE_CUSTOM);
        launch.setPhaseName("idn-release");
        launch.setType(EPPLaunch.TYPE_AVAILABILITY);

        response = (EPPDomainCheckResp) launch.sendCheck();

        System.out.println("Launch Availability Response = [" + response +
"]");

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

13.15.5.3.2 sendInfo() Method

The Launch Extension utilizes the *com.verisign.epp.interfaces.EPPDomain.sendInfo()* method, that is extended by the *com.verisign.epp.namestore.interfaces.NSDomain* class, to send a Domain Info Command with the Launch Extension.

"Figure 24 – Domain Info for Launch Application Example" shows an example of executing a Domain Info Command for a Sunrise Application with the Application Identifier of "abc123".

Figure 24 – Domain Info for Launch Application Example

```
EPPDomainInfoResp response;

try {
        NSDomain domain = new NSDomain(session);
```

```
        domain.setTransId("ABC-12345");
        domain.addDomainName("example1.tld");

        domain.addExtension(new EPPLaunchInfo(new
EPPLaunchPhase(EPPLaunchPhase.PHASE_SUNRISE), "abc123"));

        response = domain.sendInfo();

        if (response.hasExtension(EPPLaunchInfData.class)) {
                EPPLaunchInfData ext =
response.getExtension(EPPLaunchInfData.class);
                System.out.println("Phase = " + ext.getPhase().getPhase());
                System.out.println("Id = " + ext.getApplicationId());
                System.out.println("Status = " + ext.getStatus().getStatus());
                System.out.println("Mark = " + ext.getMark());
        }

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

"Figure 25 – Domain Info for Launch Registration Example" shows an example of executing a Domain Info Command for a Sunrise Registration.

Figure 25 – Domain Info for Launch Registration Example

```
EPPDomainInfoResp response;

try {
        NSDomain domain = new NSDomain(session);
```

```
        domain.setTransId("ABC-12345");
        domain.addDomainName("example1.tld");

        EPPLaunchInfo infExt = new EPPLaunchInfo(new
EPPLaunchPhase(EPPLaunchPhase.PHASE_SUNRISE));
        infExt.setIncludeMark(true);

        domain.addExtension(infExt);

        response = domain.sendInfo();

        if (response.hasExtension(EPPLaunchInfData.class)) {
                EPPLaunchInfData ext =
response.getExtension(EPPLaunchInfData.class);
                System.out.println("Phase = " + ext.getPhase().getPhase());
                System.out.println("Mark = " + ext.getMark());
        }

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

13.15.5.3.3 sendCreate() Method

The Launch Extension utilizes the *com.verisign.epp.interfaces.EPPDomain.sendCreate()* method, that is extended by the *com.verisign.epp.namestore.interfaces.NSDomain* class, to send a Domain Create Command with the Launch Extension. The Launch Extension supports all four forms (Sunrise Create Form, Claims Create Form, General Create Form, Mix Create Form).

"Figure 26 – Domain Create in Sunrise Create Form Example" shows an example of executing a Domain Create Command for a Sunrise Application with an Encoded Signed Mark.

Figure 26 – Domain Create in Sunrise Create Form Example

```
EPPResponse response;

try {
        NSDomain domain = new NSDomain(session);

        // Define Mark
        EPPMark mark = new EPPMark();
        …

        // Define Issuer
        EPPIssuer issuer = new EPPIssuer("1", "Example Inc.",
support@example.tld);
        …

        // Define Encoded Signed Mark and sign it
        EPPEncodedSignedMark signedMark =
```

```
          new EPPEncodedSignedMark("1-2", issuer,
               new GregorianCalendar(2013, 1, 1).getTime(),
               new GregorianCalendar(2014, 1, 1).getTime(),
               mark);
        signedMark.sign(privateKey, certChain);

        domain.addExtension(new EPPLaunchCreate(new
EPPLaunchPhase(EPPLaunchPhase.PHASE_SUNRISE), signedMark,
EPPLaunchCreate.TYPE_APPLICATION));

        domain.setTransId("ABC-12345");
        domain.addDomainName("example1.tld");
        domain.setAuthString("ClientX");

        response = domain.sendCreate();

        if (response.hasExtension(EPPLaunchCreData.class)) {
               EPPLaunchCreData ext =
response.getExtension(EPPLaunchCreData.class);
               System.out.println("Phase = " + ext.getPhase().getPhase());
               System.out.println("Id = " + ext.getApplicationId());
        }

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

"Figure 27 – Domain Create in Claims Create Form Example" shows an example of executing a Domain Create Command for a domain registration with the claims notice information.

Figure 27 – Domain Create in Claims Create Form Example

```
EPPResponse response;

try {
        NSDomain domain = new NSDomain(session);

        domain.setTransId("ABC-12345");
        domain.addDomainName("example1.tld");
        domain.setAuthString("ClientX");

        domain.addExtension(new EPPLaunchCreate(new
EPPLaunchPhase(EPPLaunchPhase.PHASE_CLAIMS), new
EPPLaunchNotice("49FD46E6C4B45C55D4AC", new Date(), new Date()),
EPPLaunchCreate.TYPE_REGISTRATION);
```

```
        response = domain.sendCreate();
}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

"Figure 28 – Domain Create in General Create Form Example" shows an example of executing a Domain Create Command in General Create Form to explicitly specify the phase and the type of object to create.

Figure 28 – Domain Create in General Create Form Example

```
EPPResponse response;

try {
        NSDomain domain = new NSDomain(session);

        domain.setTransId("ABC-12345");
        domain.addDomainName("example1.tld");
        domain.setAuthString("ClientX");

        domain.addExtension(new EPPLaunchCreate(new
EPPLaunchPhase(EPPLaunchPhase.PHASE_LANDRUSH),
EPPLaunchCreate.TYPE_APPLICATION);

        response = domain.sendCreate();

        if (response.hasExtension(EPPLaunchCreData.class)) {
                EPPLaunchCreData ext =
response.getExtension(EPPLaunchCreData.class);
                System.out.println("Phase = " + ext.getPhase().getPhase());
                System.out.println("Id = " + ext.getApplicationId());
        }

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

"Figure 29 – Domain Create in Mix Create Form Example" shows an example of executing a Domain Create Command in Mix Create Form to create a non-TMCH sunrise application with a mark.

Figure 29 – Domain Create in Mix Create Form Example

```
EPPResponse response;

try {
        NSDomain domain = new NSDomain(session);
```

```
        // Define Mark
        EPPMark mark = new EPPMark();
        …

        domain.setTransId("ABC-12345");
        domain.addDomainName("example1.tld");
        domain.setAuthString("ClientX");

        EPPLaunchCreate creExt = new EPPLaunchCreate(new
EPPLaunchPhase(EPPLaunchPhase.CUSTOM, "non-tmch-sunrise"),
EPPLaunchCreate.TYPE_APPLICATION);

        creExt.addCodeMark(EPPLaunchCodeMark(mark));
        creExt.setNotice(new EPPLaunchNotice("49FD46E6C4B45C55D4AC", new
Date(), new Date());
        domain.addExtension(creExt);

        response = domain.sendCreate();

        if (response.hasExtension(EPPLaunchCreData.class)) {
                EPPLaunchCreData ext =
response.getExtension(EPPLaunchCreData.class);
                System.out.println("Phase = " + ext.getPhase().getPhase());
                System.out.println("Id = " + ext.getApplicationId());
        }

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

13.15.5.3.4 sendUpdate() Method

The Launch Extension utilizes the *com.verisign.epp.interfaces.EPPDomain.sendUpdate()* method, that is extended by the *com.verisign.epp.namestore.interfaces.NSDomain* class, to send a Domain Update Command with the Launch Extension. The Launch Extension enables a client to update a launch application referenced by the Application Id returned in the Domain Create Response. "Figure 30 – Domain Update of Sunrise Application Example" shows an example of updating a sunrise application.

Figure 30 – Domain Update of Sunrise Application Example

```
EPPResponse response;

try {
        NSDomain domain = new NSDomain(session);

        domain.setTransId("ABC-12345");
        domain.addDomainName("example1.tld");

        domain.setUpdateAttrib(EPPDomain.HOST, "ns2.example.tld",
                               EPPDomain.ADD);
        domain.setUpdateAttrib(EPPDomain.HOST, "ns1.example.tld",
                               EPPDomain.REMOVE);

        // Add extension
        domain.addExtension(new EPPLaunchUpdate(new EPPLaunchPhase(
                EPPLaunchPhase.PHASE_SUNRISE), "abc123"));

        response = domain.sendUpdate();
}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

13.15.5.3.5 sendDelete() Method

The Launch Extension utilizes the *com.verisign.epp.interfaces.EPPDomain.sendDelete()* method, that is extended by the *com.verisign.epp.namestore.interfaces.NSDomain* class, to send a Domain Delete Command with the Launch Extension. The Launch Extension enables a client to delete a launch application referenced by the Application Id returned in the Domain Create Response. "Figure 30 – Domain Update of Sunrise Application Example" shows an example of updating a sunrise application.

Figure 31 – Domain Delete of Sunrise Application Example

```
EPPResponse response;

try {
        NSDomain domain = new NSDomain(session);

        domain.setTransId("ABC-12345");

        // Add extension
        domain.addExtension(new EPPLaunchDelete(new EPPLaunchPhase(
                EPPLaunchPhase.PHASE_SUNRISE), "abc123"));

        response = domain.sendDelete();
}
catch (EPPCommandException e) {
         EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

13.15.6 PersReg Extension

The Personal Registration Extension defined in "Extensible Provisioning Protocol Extension Mapping: <Personal Registration>" includes extensions to the create (Domain, Email Forwarding, and Defensive Registration) response, an extension to the info (Domain, Email Forwarding) response, and an extension to the create (Domain, Email Forwarding) command to pass a consent identifier to authorize the create with a conflicting Defensive Registration.

13.15.6.1 PersReg Extension Packages

The Personal Registration Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the Personal Registration Extension packages.

Package	Description
com.verisign.epp.codec.persreg	Personal Registration Extension EPP Encoder/Decoder package. All of the detail of encoding and decoding the Personal Registration Extension EPP messages are encapsulated in this package. The *com.verisign.epp.codec.persreg.EPPPersRegExtFactory* must be added to the *EPP.CmdRspExtensions* configuration parameter.
com.verisign.epp.interfaces	Includes the *com.verisign.epp.interfaces.EPPPersRegTst* test class for sending the Personal Registration Extension on a Domain and Email Forwarding create and receiving responses with the Personal Registration Extension.
com.verisign.epp.serverstub	Addition of the *com.verisign.epp.serverstub.PersRegDomainHandler* class and the *com.verisign.epp.serverstub.PersRegEmailFwdHandler* used to implement the EPP Personal Registration Stub Server behavior. These classes must be added to the *EPP.ServerEventHandlers* configuration to simulate a server that supports the Personal Registration Extension.

13.15.6.2 PersReg XML Schema Files

The Personal Registration Extension is defined using an XML schema file and is dependent on a set of XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
persReg-1.0.xsd	schemas	Personal Registration Extension XML Schema

13.15.6.3 PersReg Client Interface

The Personal Registration Extension is an extension to the Domain and Email Forwarding objects, so the Domain (*com.verisign.epp.interfaces.EPPDomain)* and Email Forwarding (*com.verisign.epp.interfaces.EPPEmailFwd)* Client Interface classes are used with the Personal Registration Extension.

"Figure 32 – Personal Registration Create with Consent Example" shows an example of executing a Domain Create Command with consent using the Personal Registration Create Extension *com.verisign.epp.codec.persreg.EPPPersRegCreate* class.

Figure 32 – Personal Registration Create with Consent Example

```
EPPDomainCreateResp response;

try {
        EPPDomain domain = new EPPDomain(session);

        domain.setTransId("ABC-12345");
        domain.addDomainName("example1.tld");

        domain.addExtension(new EPPPersRegCreate("ID:12345"));

        response = domain.sendCreate();

        if (response.hasExtension(EPPPersRegCreateData.class)) {
                EPPPersRegCreateData ext = (EPPPersRegCreateData)
response.getExtension(EPPPersRegCreateData.class);
                Sytem.out.println("bundle rate = " + ext.isBundleRate());
        }

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        if (errorResponse.hasExtension(EPPPersRegCreateErrData.class)) {
                EPPPersRegCreateErrData ext = (EPPPersRegCreateErrData)
errorResponse.getExtension(EPPPersRegCreateErrData.class);
                System.out.println("PersReg error = " + ext);
        }
        Assert.fail(e.getMessage());
}
```

13.15.7 Related Domain Extension

The Related Domain Extension defined in "Extensible Provisioning Protocol Extension Mapping: <Related Domain>" includes an extension to the domain name mapping for managing client-side and server-side domain name relationships.

13.15.7.1 Related Domain Extension Packages

The Related Domain Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the Related Domain Extension packages.

Package	Description
com.verisign.epp.codec.relateddomainext	Related Domain Extension EPP Encoder/Decoder package. All of the detail of encoding and decoding the Related Domain Extension EPP messages are encapsulated in this package. The *com.verisign.epp.codec.relateddomainext.EPPRelatedDomainExtFactory* must be added to the *EPP.CmdRspExtensions* configuration parameter.
com.verisign.epp.interfaces	Includes the *com.verisign.epp.interfaces.EPPRelatedDomain* class to send both forms of the info command (Domain Info Form and Related Info Form) and the multiple related domain transform commands (Create, Update, Delete, Renew, and Transfer), and *com.verisign.epp.interfaces.EPPRelatedDomainTst* test class for testing the *com.verisign.epp.interfaces.EPPRelatedDomain* class.
com.verisign.epp.serverstub	Addition of the *com.verisign.epp.serverstub.RelatedDomainHandler* class used to implement the EPP Related Domain Stub Server behavior. These classes must be added to the *EPP.ServerEventHandlers* configuration to simulate a server that supports the Related Domain Extension.

13.15.7.2 Related Domain XML Schema Files

The Related Domain Extension is defined using an XML schema file and is dependent on a set of XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
relatedDomain-1.0.xsd	schemas	Related Domain Extension XML Schema

13.15.7.3 Related Domain Client Interface

The Related Domain Extension is an extension to the Domain object, so the *com.verisign.epp.interfaces.EPPRelatedDomain* class extends the *com.verisign.epp.interfaces.EPDomain*, and is a superclass of the *com.verisign.epp.namestore.interfaces.NSDomain* class. The *com.verisign.epp.interfaces.EPPRelatedDomain* Client Interface class methods can be used to send the info command with the two types / forms (*EPPRelatedDomain.TYPE_DOMAIN* for the Domain Info Form and *EPPRelatedDomain.TYPE_RELATED* for the Related Info Form) or the multiple related domain transform commands (create, update, delete, renew, and transfer). The *EPPRelatedDomain.sendRelatedInfo() : EPPResponse* is used to get the *com.verisign.epp.codec.domain.EPPDomainInfoResp,* for the Domain Info Form, and the *com.verisign.epp.codec.gen.EPPResponse,* for the Related Info Form, with the *com.verisign.epp.codec.relateddomainext.EPPRelatedDomainExtInfoData* extension.

"Figure 33 – Related Domain Info Command in Domain Info Form Example" shows an example of executing a Domain Info Command in the Domain Info Form to receive a response that includes the Related the domain information for "example1.tld" along with the related domain information in the *com.verisign.epp.codec.relateddomainext.EPPRelatedDomainExtInfData* class.

Figure 33 – Related Domain Info Command in Domain Info Form Example

```
EPPDomainInfoResp response;

try {
       EPPRelatedDomain relDomain = new EPPRelatedDomain(session);
```

```
        relDomain.setTransId("ABC-12345");
        relDomain.addDomainName("example1.tld");
        relDomain.setInfoForm(EPPRelatedDomain.DOMAIN_INFO_FORM);

        response = (EPPDomainInfoResp) relDomain.sendRelatedInfo();

        if (response.hasExtension(EPPRelatedDomainExtInfData.class)) {
                EPPRelatedDomainExtInfData ext = (EPPRelatedDomainExtInfData)
response.getExtension(EPPRelatedDomainExtInfData.class);
                Sytem.out.println("related domain info = " + ext);
        }

        // Get the domain info for example1.tld
        System.out.println("Domain ROID = " + response.getRoid());

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

"Figure 34 – Related Domain Info Command in Related Info Form Example" shows an example of executing a Domain Info Command in the Related Info Form to receive a response that includes the related domain information of "example1.tld" in the *com.verisign.epp.codec.relateddomainext.EPPRelatedDomainExtInfData* class.

Figure 34 – Related Domain Info Command in Related Info Form Example

```
EPPResponse response;

try {
        EPPRelatedDomain relDomain = new EPPRelatedDomain(session);

        relDomain.setTransId("ABC-12345");
        relDomain.addDomainName("example1.tld");

        relDomain.setInfoForm(EPPRelatedDomain.RELATED_INFO_FORM);

        response = relDomain.sendRelatedInfo();

        if (response.hasExtension(EPPRelatedDomainExtInfData.class)) {
                EPPRelatedDomainExtInfData ext = (EPPRelatedDomainExtInfData)
response.getExtension(EPPRelatedDomainExtInfData.class);
                Sytem.out.println("related domain info = " + ext);
        }

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

"Figure 35 – Related Domain Create Command Example" shows an example of executing a Related Domain Create Command to create all of the domains "example.com", "domain1.com", "domain2.com", and "xn—idn.com" at once.

Figure 35 – Related Domain Create Command Example

```
EPPDomainCreateResp response;

try {
        EPPRelatedDomain relDomain = new EPPRelatedDomain(session);

        relDomain.setTransId("ABC-12345");
        relDomain.addDomainName("example1.tld");
        relDomain.setAuthString("2fooBAR");

        EPPRelatedDomainExtAuthInfo authInfo = new
EPPRelatedDomainExtAuthInfo("relDom123!");
        EPPRelatedDomainExtPeriod period = new EPPRelatedDomainExtPeriod(5);

        relDomain.addRelatedDomain(new
EPPRelatedDomainExtDomain("domain1.com", authInfo, period));
        relDomain.addRelatedDomain(new
EPPRelatedDomainExtDomain("domain2.com", authInfo, period));
        relDomain.addRelatedDomain(new EPPRelatedDomainExtDomain("xn—idn.com",
authInfo, period, "CHI"));

        response = relDomain.sendRelatedCreate();

        if (response.hasExtension(EPPRelatedDomainExtCreateResp.class)) {
                EPPRelatedDomainExtCreateResp ext =
(EPPRelatedDomainExtCreateResp)
response.getExtension(EPPRelatedDomainExtCreateResp.class);
                Sytem.out.println("related domain create = " + ext);
        }

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

"Figure 36 – Related Domain Delete Command Example" shows an example of executing a Related Domain Delete Command to delete all of the domains "example.com", "domain1.com", "domain2.com", and "xn—idn.com" at once.

Figure 36 – Related Domain Delete Command Example

```
EPPResponse response;

try {
        EPPRelatedDomain relDomain = new EPPRelatedDomain(session);
```

```
        relDomain.setTransId("ABC-12345");
        relDomain.addDomainName("example1.tld");

        relDomain.addRelatedName("domain1.com");
        relDomain.addRelatedName("domain2.com");
        relDomain.addRelatedName("xn--idn.com");

        response = relDomain.sendRelatedDelete();

        if (response.hasExtension(EPPRelatedDomainExtDeleteResp.class)) {
                EPPRelatedDomainExtDeleteResp ext =
(EPPRelatedDomainExtDeleteResp)
response.getExtension(EPPRelatedDomainExtDeleteResp.class);
                Sytem.out.println("related domain delete = " + ext);
        }

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

"Figure 37 – Related Domain Update Command Example" shows an example of executing a Related Domain Update Command to update all of the domains "example.com", "domain1.com", "domain2.com", and "xn—idn.com" by adding the clientHold status.

Figure 37 – Related Domain Update Command Example

```
EPPResponse response;

try {
        EPPRelatedDomain relDomain = new EPPRelatedDomain(session);

        relDomain.setTransId("ABC-12345");
        relDomain.addDomainName("example1.tld");

        relDomain.addRelatedName("domain1.com");
        relDomain.addRelatedName("domain2.com");
        relDomain.addRelatedName("xn--idn.com");

        relDomain.setUpdateAttrib( EPPDomain.STATUS, new
EPPDomainStatus(EPPDomain.STATUS_CLIENT_HOLD, EPPDomain.ADD);

        response = relDomain.sendRelatedUpdate();


}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

"Figure 38 – Related Domain Renew Command Example" shows an example of executing a Related Domain Renew Command to renew all of the domains "example.com", "domain1.com", "domain2.com", and "xn—idn.com" for 5 years.

Figure 38 – Related Domain Renew Command Example

```
EPPDomainRenewResp response;

try {
        EPPRelatedDomain relDomain = new EPPRelatedDomain(session);

        Date  currExpDate = new GregorianCalendar(2013, 9, 10).getTime();

        relDomain.setTransId("ABC-12345");
        relDomain.addDomainName("example1.tld");

        relDomain.setPeriodLength(5);

        EPPRelatedDomainExtPeriod period = new EPPRelatedDomainExtPeriod(5);

        relDomain.addRelatedDomain(new
EPPRelatedDomainExtDomain("domain1.com", currExpDate, period));
        relDomain.addRelatedDomain(new
EPPRelatedDomainExtDomain("domain2.com", currExpDate, period));
        relDomain.addRelatedDomain(new
EPPRelatedDomainExtDomain("xn—idn.com", currExpDate, period));

        response = relDomain.sendRelatedRenew();

        if (response.hasExtension(EPPRelatedDomainExtRenewResp.class)) {
                EPPRelatedDomainExtRenewResp ext =
(EPPRelatedDomainExtRenewResp)
response.getExtension(EPPRelatedDomainExtRenewResp.class);
                Sytem.out.println("related domain renew = " + ext);
        }

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

"Figure 39 – Related Domain Transfer Command Example" shows an example of executing a Related Domain Transfer Command to request transfer of all the domains "example.com", "domain1.com", "domain2.com", and "xn—idn.com".

Figure 39 – Related Domain Transfer Command Example

```
EPPResponse response;

try {
        EPPRelatedDomain relDomain = new EPPRelatedDomain(session);
```

```
        relDomain.setTransId("ABC-12345");
        relDomain.addDomainName("example1.tld");

        relDomain.setTransferOpCode(EPPDomain.TRANSFER_REQUEST);
        relDomain.setAuthString("2fooBAR");
        relDomain.setPeriodLength(1);

        EPPRelatedDomainExtPeriod period = new EPPRelatedDomainExtPeriod(1);
        EPPRelatedDomainExtAuthInfo authInfo = new
EPPRelatedDomainExtAuthInfo("relDom123!");

        relDomain.addRelatedDomain(new
EPPRelatedDomainExtDomain("domain1.com", authInfo, period));
        relDomain.addRelatedDomain(new
EPPRelatedDomainExtDomain("domain2.com", authInfo, period));
        relDomain.addRelatedDomain(new
EPPRelatedDomainExtDomain("xn—idn.com", authInfo, period));

        response = relDomain.sendRelatedTransfer();

        if (response.hasExtension(EPPRelatedDomainExtTransferResp.class)) {
                EPPRelatedDomainExtTransferResp ext =
(EPPRelatedDomainExtTransferResp)
response.getExtension(EPPRelatedDomainExtTransferResp.class);
                Sytem.out.println("related domain transfer = " + ext);
        }

}
catch (EPPCommandException e) {
        EPPResponse errorResponse = e.getResponse();
        Assert.fail(e.getMessage());
}
```

13.15.8 Change Poll Extension

The Change Poll Extension defined in "Change Poll Extension for the Extensible Provisioning Protocol (EPP)" includes an extension to any object mapping for notifying clients of operations on client sponsored objects that were not initiated by the client through EPP.

13.15.8.1 Change Poll Extension Packages

The Change Poll Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the Change Poll Extension packages.

Package	Description
com.verisign.epp.codec.changepoll	Change Poll Extension EPP Encoder/Decoder package. All of the detail of encoding and decoding the Change Poll Extension EPP messages are encapsulated in this package. The *com.verisign.epp.codec.changepoll.EPPChangePollExtFactory* must be added to the *EPP.CmdRspExtensions* configuration parameter.
com.verisign.epp.interfaces	Includes *com.verisign.epp.interfaces.EPPChangePollDomainTst* test class for testing the Change Poll Extension against the Stub Server.
com.verisign.epp.serverstub	Addition of the *com.verisign.epp.serverstub.ChangePollDomainHandler* class used to implement the EPP Change Poll Domain Stub Server behavior. These classes must be added to the *EPP.ServerEventHandlers* configuration to simulate a server that supports the Change Poll Extension for domain objects.

13.15.8.2 Change Poll Extension XML Schema Files

The Change Poll Extension is defined using an XML schema file and is dependent on a set of XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
changePoll-1.0.xsd	schemas	Change Poll Extension XML Schema

13.15.9 Registry Fee Extension

The Registry Fee Extension defined in "Registry Fee Extension for the Extensible Provisioning Protocol (EPP)" that provides a mechanism by which EPP clients may query the fees and credits associated with various billable transactions and alos obtain their current account balance.

13.15.9.1 Registry Fee Extension Packages

The Registry Fee Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the Registry Fee Extension packages.

Package	Description
com.verisign.epp.codec.fee	Registry Fee Extension EPP Encoder/Decoder package. All of the detail of encoding and decoding the Registry Fee EPP messages are encapsulated in this package. The *com.verisign.epp.codec.fee.v1_0.EPFeeExtFactory* must be added to the *EPP.CmdRspExtensions* configuration parameter to support RFC 8748.
com.verisign.epp.interfaces	Includes *com.verisign.epp.interfaces.v1 0.EPPFeeDomainTst* test class for testing the Registry Fee Extension against the Stub Server to support RFC 8748.
com.verisign.epp.serverstub	Addition of the *com.verisign.epp.serverstub.FeeDomainHandler* class used to implement the EPP Registry Fee Domain Stub Server behavior to support RFC 8748. These classes must be added to the *EPP.ServerEventHandlers* configuration to simulate a server that supports the Registry Fee Extension.

13.15.9.2 Registry Fee Extension XML Schema Files

The Registry Fee Extension is defined using an XML schema file and is dependent on a set of XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
fee-1.0.xsd	schemas	RFC 8748 Registry Fee Extension XML Schema

13.15.10 Allocation Token Extension

The Allocation Token Extension defined in "Allocation Token Extension for the Extensible Provisioning Protocol (EPP)" that is used to support including an allocation token or code for allocating an object like a domain name to the client.

13.15.10.1 Allocation Token Extension Packages

The Allocation Token Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the Allocation Token Extension packages.

Package	Description
com.verisign.epp.codec.allocationtoken	Allocation Token Extension EPP Encoder/Decoder package. All of the detail of encoding and decoding the Allocation Token EPP messages are encapsulated in this package.
com.verisign.epp.interfaces	Includes *com.verisign.epp.interfaces.EPPAllocationTokenDomainTst* test class for testing the Allocation Token Extension against the Stub Server.
com.verisign.epp.serverstub	Addition of the *com.verisign.epp.serverstub.AllocationTokenDomainHandler* class used to implement the EPP Allocation Token Domain Stub Server. These classes must be added to the *EPP.ServerEventHandlers* configuration to simulate a server that supports the Allocation Token Extension.

13.15.10.2 Allocation Token Extension XML Schema Files

The Allocation Token Extension is defined using an XML schema file and is dependent on a set of XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
allocationToken-1.0.xsd	schemas	Allocation Token Extension XML Schema

13.15.11 IDN Map Extension

The IDN Map Extension defined in "Internationalized Domain Name Mapping Extension for the Extensible Provisioning Protocol (EPP)" that is used to pass the Internationized Domain Name (IDN) table identifier for IDN domain names.

13.15.11.1 IDN Map Extension Packages

The IDN Map Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the IDN Map Extension packages.

Package	Description
com.verisign.epp.codec.idnmap	IDN Map Extension EPP Encoder/Decoder package. All of the detail of encoding and decoding the IDN Map EPP messages are encapsulated in this package.
com.verisign.epp.interfaces	Includes *com.verisign.epp.interfaces.EPPIdnMapDomainTst* test class for testing the IDN Map Extension against the Stub Server.
com.verisign.epp.serverstub	Addition of the *com.verisign.epp.serverstub.IdnMapDomainHandler* class used to implement the EPP IDN Map Domain Stub Server. These classes must be added to the *EPP.ServerEventHandlers* configuration to simulate a server that supports the IDN Map Extension.

13.15.11.2 IDN Map Extension XML Schema Files

The IDN Map Extension is defined using an XML schema file and is dependent on a set of XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
idn-1.0.xsd	schemas	IDN Map Extension XML Schema

13.15.12 Verification Code Extension

The Verification Code Extension, defined in "Verification Code Extension for the Extensible Provisioning Protocol (EPP)", provides support for including a verification code for makring the data for a transform command as being verified by a 3rd party, which is referred to as the Verification Service Provider (VSP). The verification code is digitally signed by the VSP using XML Signature and is "base64" encoded". The extension also supports an extension to the info command and response to receive the verification compliance status of the domain name along with the relavant information like the verification codes that have been set and the verification codes that are missing.

13.15.12.1 Verification Code Extension Packages

The Verification Code Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the Verification Code Extension packages.

Package	Description
com.verisign.epp.codec.verificationcode	Verification Code Extension EPP Encoder/Decoder package. All of the detail of encoding and decoding the Verification Code EPP messages are encapsulated in this package.
com.verisign.epp.interfaces	Includes *com.verisign.epp.interfaces.EPPVerificationCodeDomainTst* test class for testing the Verification Code Extension against the Stub Server.
com.verisign.epp.serverstub	Addition of the *com.verisign.epp.serverstub.VerificationCodeDomainHandler* class used to implement the EPP Verification Code Domain Stub Server. These classes must be added to the *EPP.ServerEventHandlers* configuration to simulate a server that supports the Verification Code Extension.

13.15.12.2 Verification Code Extension XML Schema Files

The Verification Code Extension is defined using an XML schema file and is dependent on a set of XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
verificationCode-1.0.xsd	schemas	Verification Code Extension XML Schema

13.15.13 Organization Extension

The Organization Extension, defined in "Organization Extension for the Extensible Provisioning Protocol (EPP)", provides support for assigning an organization with a role to existing object (domain, host, contact) as well as any future objects.

13.15.13.1 Organization Extension Packages

The Organization Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the Organization Extension packages.

Package	Description
com.verisign.epp.codec.orgext	Organization Extension EPP Encoder/Decoder package. All the detail of encoding and decoding the Organization Extension EPP messages are encapsulated in this package.
com.verisign.epp.interfaces	Includes *com.verisign.epp.interfaces.EPPOrgExtDomainTst* test class for testing the Organization Extension against the Stub Server.
com.verisign.epp.serverstub	Addition of the *com.verisign.epp.serverstub.OrgExtDomainHandler* class used to implement the EPP Organization Extension Domain Stub Server. These classes must be added to the *EPP.ServerEventHandlers* configuration to simulate a server that supports the Organization Extension.

13.15.13.2 Organization Extension XML Schema Files

The Organization Extension is defined using an XML schema file and is dependent on a set of XML schema files. These files are in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
orgext-1.0.xsd	schemas	Organization Extension XML Schema

13.15.14 Login Security Extension

The Login Security Extension defined in "Login Security for the Extensible Provisioning Protocol (EPP)" that provides a enhances the security of the EPP connection and login by supporting passwords creater than 16 characters, supporting the passing of client user agent information to the server for identifying current and future issues, and supporting the return of security events (errors and warnings) in the login response for the client to address.

13.15.14.1 Login Security Extension Packages

The Login Security Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the Login Security Extension packages.

Package	Description
com.verisign.epp.codec.loginsec	Login Security Extension EPP Encoder/Decoder package. All of the detail of encoding and decoding the Login Security EPP messages are encapsulated in this package. The *com.verisign.epp.codec.fee.v1_0.EPPLoginSecExtFactory* must be added to the *EPP.CmdRspExtensions* configuration parameter to support RFC 8807.
com.verisign.epp.interfaces	Includes *com.verisign.epp.interfaces.v1_0.EPPLoginSecTst* test class for testing the Login Security Extension against the Stub Server to support RFC 8807.
com.verisign.epp.serverstub	Addition of the *com.verisign.epp.serverstub.LoginSecGenHandler* class that extends the *com.verisign.epp.serverstub.GenHandler* for adding support for the Login Security Extension with the login command and inclusion of the Login Security Extension in the login response. The LoginSecGenHandler will route requests to the version specific LoginSecSubGenHandler. The only version specific LoginSecSubGenHandler is com.verisign.epp.serverstub.v1_0. LoginSecV1_0GenHandler to support RFC 8807. The *com.verisign.epp.serverstub.LoginSecGenHandle* class must be added to the *EPP.ServerEventHandlers* in place of *com.verisign.epp.serverstub.GenHandler* to simulate a server that supports the different versions of the Login Security Extension.

13.15.14.2 Login Security Extension XML Schema Files

The Login Security Extension is defined using an XML schema file and is dependent on a set of XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
loginSec-1.0.xsd	schemas	RFC 8807 Login Security Extension XML Schema

13.15.15 Launch Policy Extension

The Launch Policy Extension in "Launch Phase Policy Extensions Mapping for the Extensible Provisioning Protocol (EPP)" is an extension of the Registry Mapping that defines the server policy of the Launch Phase EPP extension.

13.15.15.1 Launch Policy Extension Packages

The Launch Policy Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the Launch Policy Extension packages.

Package	Description
com.verisign.epp.codec.launchpolicy	Launch Policy Extension EPP Encoder/Decoder package. All of the detail of encoding and decoding the Login Security EPP messages are encapsulated in this package. The *com.verisign.epp.codec.launchpolicy.v01.EPPLaunchPolicyExtFactory* must be added to the *EPP.CmdRspExtensions* configuration parameter to support draft-gould-regext-launch-policy-03.
com.verisign.epp.interfaces	Includes *com.verisign.epp.interfaces.launchpolicy.v01.EPPLaunchPolicyTst* test class for testing the Launch Policy Extension against the Stub Server for draft-gould-regext-launch-policy-03.
com.verisign.epp.serverstub	For the Launch Policy Extension to be supported by the Stub Server, the *com.verisign.epp.serverstub.registry.v02.RegistryHandler* or later must be added to the *EPP.*ServerEventHandlers configuration parameter, and the desired Launch Policy Extension adapter must be added to the *EPP.RegistryPolicyAdapters* configuration parameter. The *com.verisign.epp.codec.launchpolicy.v04.EPPLaunchPolicyAdapter* must be added to *EPP.RegistryPolicyAdapters* configuration parameter to support draft-gould-regext-launch-policy-03.

13.15.15.2 Launch Policy Extension XML Schema Files

The Launch Policy Extension is defined using an XML schema file and is dependent on a set of XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
launchPolicy-0.4.xsd	schemas	draft-gould-regext-launch-policy-03 Launch Policy Extension XML Schema

13.15.16 Login Security Policy Extension

The Login Security Policy Extension in "Login Security Policy Extensions Mapping for the Extensible Provisioning Protocol (EPP)" is an extension of the Registry Mapping that defines the server policy of the Login Security EPP extension.

13.15.16.1 Login Security Policy Extension Packages

The Login Security Policy Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the Login Security Policy Extension packages.

Package	Description
com.verisign.epp.codec.loginsecpolicy	Login Security Policy Extension EPP Encoder/Decoder package. All of the detail of encoding and decoding the Login Security Policy EPP messages are encapsulated in this package. The *com.verisign.epp.codec.loginsecpolicy.v04.EPPLoginSecPolicyExtFactory* must be added to the *EPP.CmdRspExtensions* configuration parameter to support draft-gould-regext-login-security-policy-03.
com.verisign.epp.interfaces	Includes *com.verisign.epp.interfaces.loginsecpolicy.v04.EPPLoginSecPolicyTst* test class for testing the Login Security Policy Extension against the Stub Server for draft-gould-regext-login-security-policy-03.
com.verisign.epp.serverstub	For the Login Security Policy Extension to be supported by the Stub Server, the *com.verisign.epp.serverstub.registry.v02.RegistryHandler* or later must be added to the *EPP.*ServerEventHandlers configuration parameter, and the desired Login Security Policy Extension adapter must be added to the *EPP.RegistryPolicyAdapters* configuration parameter. The *com.verisign.epp.codec.loginsecpolicy.v04.EPPLoginSecPolicyAdapter* must be added to *EPP.RegistryPolicyAdapters* configuration parameter to support draft-gould-regext-login-security-policy-03.

13.15.16.2 Login Security Policy Extension XML Schema Files

The Login Security Policy Extension is defined using an XML schema file and is dependent on a set of XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
loginSecPolicy-0.4.xsd	schemas	draft-gould-regext-login-security-policy-03 Login Security Policy Extension XML Schema

13.15.17 Validate Extension

The Validate Extension in "Validate Mapping for the Extensible Provisioning Protocol (EPP)" describes a mapping for the validation of contact and eligibility data.

13.15.17.1 Validate Extension Packages

The Validate Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the Validate Extension packages.

Package	Description
com.verisign.epp.codec.validate	Validate Extension EPP Encoder/Decoder package. All of the detail of encoding and decoding the Validate EPP messages are encapsulated in this package. The *com.verisign.epp.codec.validate.v02.EPPValidateMapFactory* must be added to the *EPP.MapFactories* configuration parameter to support draft-ietf-regext-validate-04.
com.verisign.epp.interfaces	Includes *com.verisign.epp.interfaces.validate.v02.EPPValidateTst* test class for testing the Validate Extension against the Stub Server for draft-ietf-regext-validate-04.
com.verisign.epp.serverstub	For the Validate Extension to be supported by the Stub Server, the *com.verisign.epp.serverstub.validate.v02.ValidateHandler* or later must be added to the *EPP.*ServerEventHandlers configuration parameter. The *com.verisign.epp.serverstub.validate.v02.ValidateHandler* is used to support draft-ietf-regext-validate-04.

13.15.17.2 Validate Extension XML Schema Files

The Validate Extension is defined using an XML schema file and is dependent on a set of XML schema files. These files are located in the *epp-verisign-bundle-{$BUILD_VER}.jar* in the ***schemas*** directory. You must un-jar the jar file in order to explicitly view them.

File Name	Location	Description
validate-0.2.xsd	schemas	draft-ietf-regext-validate-04 Validate Extension XML Schema

13.15.18 Secure Authorization Information for Transfer Extension

The Secure Authorization Information for Transfer Extension in "Extensible Provisioning Protocol (EPP) Secure Authorization Information for Transfer" describes a signalling support for the operational practice in RFC 9154.

13.15.18.1 Secure Authorization Information for Transfer Extension Packages

The Secure Authorization Information for Transfer Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the extension packages.

Package	Description
com.verisign.epp.codec.secureauthinfo.v1_0	Secure Authorization Information for Transfer Extension EPP Encoder/Decoder package. Contains the *EPPSecureAuthInfoExtFactory* class. The *com.verisign.epp.codec.secureauthinfo.v1_0.EPPSecureAuthInfoExtFactory* must be added to the *EPP.ExtFactories* configuration parameter to support RFC 9154.
com.verisign.epp.interfaces.secureauthinfo.v1_0	Includes the *com.verisign.epp.interfaces.secureauthinfo.v1_0.EPPSecureAuthInfoTst* test class for testing the use of the operational practice in RFC 9154 against the Stub Server.
com.verisign.epp.serverstub.secureauthinfo.v1_0	For the Secure Authorization Information for Transfer Extension to be supported by the Stub Server, the *com.verisign.epp.serverstub.secureauthinfo.v1_0.SecureAuthInfoDomainHandler* and *com.verisign.epp.serverstub.secureauthinfo.v1_0.SecureAuthInfoContactHandler* classes must be added to the *EPP.*ServerEventHandlers configuration parameter.
com.verisign.epp.util.secureauthinfo	Includes the utility class *EPPAuthInfoFactory*, which can create a secure random authorization information value.

13.15.19 Additional Email Address Extension

The Additional Email Address Extension describes a functional extension to support Internationalized Email Addresses in the EPP protocol.

13.15.19.1 Additional Email Address Extension Packages

The Additional Email Address Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the extension packages.

Package	Description
com.verisign.epp.codec.addlemail	Additional Email Address Extension EPP Encoder/Decoder package. Contains the *EPPAddlEmailExtFactory* class. The *com.verisign.epp.codec.addlemail.EPPAddlEmailExtFactory* must be added to the *EPP.ExtFactories* configuration parameter
com.verisign.epp.interfaces.addlemail	Includes the *com.verisign.epp.interfaces.addlemail.EPPAddlEmailTst* test class for testing the extension against the Stub Server.
com.verisign.epp.serverstub.addlemail	For the Additional Email Address Extension to be supported by the Stub Server, the *com.verisign.epp.serverstub.addlemail.AddlEmailContactHandler* class must be added to the *EPP.*ServerEventHandlers configuration parameter.

13.15.20 TTL Extension

The EPP mapping for DNS Time-To-Live (TTL) values describes a functional extension to support TTL extension in the EPP protocol.

13.15.20.1 TTL Extension Packages

The TTL Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the extension packages.

Package	Description
com.verisign.epp.codec.ttl.v1_0	Use of TTL Extension EPP Encoder/Decoder package contains the *EPPTtlExtFactory* class. The *com.verisign.epp.codec.ttl.v1_0.EPPTtlExtFactory* must be added to the *EPP.ExtFactories* configuration parameter to support the TTL Extension.
com.verisign.epp.interfaces.ttl.v1_0	Includes the *com.verisign.epp.interfaces.ttl.v1_0.EPPTtlTst* test class for testing the use of the functional extension in the TTL Extension against the Stub Server.
com.verisign.epp.serverstub.ttl.v1_0	For the TTL Extension to be supported by the Stub Server, the *com.verisign.epp.serverstub.ttl.v1_0. TtlV1_0DomainHandler* class and *com.verisign.epp.serverstub.ttl.v1_0. TtlV1_0HostHandler* class must be added to the *EPP.*ServerEventHandlers configuration parameter.

13.15.21 Change Mapping and Extension

The Change Mapping is used to provision Change Request objects that are linked to commands to non-Change Request objects with the Change Extension.

13.15.21.1 Change Extension Packages

The Change Mapping and Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the extension packages.

Package	Description
com.verisign.epp.codec.change	Use of Change Mapping EPP Encoder/Decoder package. Contains the *EPPChangeMapFactory* class. The *com.verisign.epp.codec.change.EPPChangeMapFactory* must be added to the *EPP.MapFactories* configuration parameter to support the Change Mapping
com.verisign.epp.codec.changeext	Use of Change Mapping EPP Encoder/Decoder package. Contains the *EPPChangeExtFactory* class. The *com.verisign.epp.codec.changeext.EPPChangeExtFactory* must be added to the *EPP.ExtFactories* configuration parameter to support the Change Mapping
com.verisign.epp.interfaces	Includes the *com.verisign.epp.interfaces.EPPChange* class for the client interface of the Change Mapping and *com.verisign.epp.interfaces.EPPChangeTst* class for the client interface test.
com.verisign.epp.rootzone.interfaces	Includes the *com.verisign.epp.rootzone.interfaces.RZDomain* and *com.verisign.epp.rootzone.interfaces.RZHost* class for linking a non-Change command to a Change Request with the associated test classes (*RZDomainTst* and *RZHostTst*) that use of the Change Extension against the Stub Server.
com.verisign.epp.serverstub	For the Change Mapping Extension to be supported by the Stub Server, the *com.verisign.epp.serverstub.ChangeHandler* class or *com.verisign.epp.serverstub.RZChangeHandler* must be added to the *EPP.*ServerEventHandlers configuration parameter. The *ChangeHandler* works with the interfaces client tests and the *RZChangeHandler* simulates a persistent change handler along with the

	com.verisign.epp.serverstub.RZDomainHandler and *com.verisign.epp.serverstub.RZHostHandler* that leverage the Change Extension.

13.15.22 Key Relay Mapping

The Key Relay Mapping is used to create a Key Relay Poll Message to relay DNSSEC key material between EPP clients.

13.15.22.1 Key Relay Mapping Packages

The Key Relay Mapping consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the extension packages.

Package	Description
com.verisign.epp.codec.keyrelay	Use of Key Relay Mapping EPP Encoder/Decoder package. Contains the *EPPKeyRelayMapFactory* class. The *com.verisign.epp.codec.keyrelay.EPPKeyRelayMapFactory* must be added to the *EPP.MapFactories* configuration parameter to support the Key Relay Mapping
com.verisign.epp.interfaces	Includes the *com.verisign.epp.interfaces.EPPKeyRelay* class for the client interface of the Key Relay Mapping and *com.verisign.epp.interfaces.EPPKeyRelayTst* class for the client interface test.
com.verisign.epp.serverstub	For the Key Relay Mapping to be supported by the Stub Server, the *com.verisign.epp.serverstub.KeyRelayHandler* class must be added to the *EPP.*ServerEventHandlers configuration parameter. The *com.verisign.epp.serverstub.KeyRelayPollHandler* class must be added to the *EPP.PollHandlers* configuration

13.15.23 Balance Mapping (IETF)

The Balance Mapping (IETF) supports an on-demand Balance Info Command to get the balance information for a registrar and supports a Low Balance Poll Message. This Balance Mapping is being worked on at the IETF and originated by merging the Verisign Balance Mapping and the Verisign Low Balance Mapping.

13.15.23.1 Balance Mapping (IETF) Packages

The Balance Mapping (IETF) consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the extension packages.

Package	Description
com.verisign.epp.codec.balance.v02	Use of Balance Mapping v02 EPP Encoder/Decoder package. Contains the *EPPBalanceMapFactory* class. The *com.verisign.epp.codec.balance.v02.EPPBalanceMapFactory* must be added to the *EPP.MapFactories* configuration parameter to support the Authentication Token Mapping
com.verisign.epp.codec.balance.v03	Use of Balance Mapping v03 EPP Encoder/Decoder package. Contains the *EPPBalanceMapFactory* class. The *com.verisign.epp.codec.balance.v03.EPPBalanceMapFactory* must be added to the *EPP.MapFactories* configuration parameter to support the Authentication Token Mapping
com.verisign.epp.codec.balance.v04	Use of Balance Mapping v04 EPP Encoder/Decoder package. Contains the *EPPBalanceMapFactory* class. The *com.verisign.epp.codec.balance.v04.EPPBalanceMapFactory* must be added to the *EPP.MapFactories* configuration parameter to support the Authentication Token Mapping
com.verisign.epp.interfaces.balance.v02	Includes the *com.verisign.epp.interfaces.v02,EPPBalance* class for the client interface of the Balance Mapping v02 and *com.verisign.epp.interfaces.v02.EPPBalanceTst* class for the client interface test.
com.verisign.epp.interfaces.balance.v03	Includes the *com.verisign.epp.interfaces.v03,EPPBalance* class for the client interface of the Balance Mapping v03 and

	com.verisign.epp.interfaces.v03.EPPBalanceTst class for the client interface test.
com.verisign.epp.interfaces.balance.v04	Includes the *com.verisign.epp.interfaces.v04,EPPBalance* class for the client interface of the Balance Mapping v04 and *com.verisign.epp.interfaces.v04.EPPBalanceTst* class for the client interface test.
com.verisign.epp.serverstub.balance.v02	For the Balance Mapping v02 to be supported by the Stub Server, the *com.verisign.epp.serverstub.balance.v02.BalanceHandler* class must be added to the *EPP.*ServerEventHandlers configuration parameter and the *com.verisign.epp.serverstub.balance.v02.BalancePollHandler* must be added to the *EPP.PollHandlers* configuration parameter.
com.verisign.epp.serverstub.balance.v03	For the Balance Mapping v03 to be supported by the Stub Server, the *com.verisign.epp.serverstub.balance.v03.BalanceHandler* class must be added to the *EPP.*ServerEventHandlers configuration parameter and the *com.verisign.epp.serverstub.balance.v03.BalancePollHandler* must be added to the *EPP.PollHandlers* configuration parameter.
com.verisign.epp.serverstub.balance.v04	For the Balance Mapping v04 to be supported by the Stub Server, the *com.verisign.epp.serverstub.balance.v04.BalanceHandler* class must be added to the *EPP.*ServerEventHandlers configuration parameter and the *com.verisign.epp.serverstub.balance.v04.BalancePollHandler* must be added to the *EPP.PollHandlers* configuration parameter.

13.15.24 Authentication Token Mapping

The Authentication Token Mapping is used to authenticate a Registrar User for the creation of a Authentication Token that can be passed in the Status Set Extension to authorize Status Set commands.

13.15.24.1 Authentication Token Mapping Packages

The Authentication Token Mapping consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the extension packages.

Package	Description
com.verisign.epp.codec.authtoken	Use of Authentication Token Mapping EPP Encoder/Decoder package. Contains the *EPPKeyRelayMapFactory* class. The *com.verisign.epp.codec.authtoken.v01.EPPAuthTokenMapFactory* must be added to the *EPP.MapFactories* configuration parameter to support the Authentication Token Mapping
com.verisign.epp.interfaces	Includes the *com.verisign.epp.interfaces.v01,EPPAuthToken* class for the client interface of the Authentication Token Mapping and *com.verisign.epp.interfaces.v01.EPPAuthTokenTst* class for the client interface test.
com.verisign.epp.serverstub	For the Authentication Token Mapping to be supported by the Stub Server, the *com.verisign.epp.serverstub.v01.AuthTokenHandler* class must be added to the *EPP.*ServerEventHandlers configuration parameter.

13.15.25 Status Set Extension

The Status Set Extension defines a new set of commands that can be applied to any EPP object, such as Domain Name and Host that allows for the provisioning of client status sets and the ability to disable one or more client status sets based on authorization from M-of-N authentication tokens created by the Authentication Token Mapping. A Status Set is an object that maps to zero or more Status Values (e.g., clientUpdateProhibited, clientDeleteProhibited, clientTransferProhibited), where the Status Set reflects the reasons for setting the Status Values.

13.15.25.1 Status Set Extension Packages

The Status Set Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the extension packages.

Package	Description
com.verisign.epp.codec.statusset.v01	Use of Status Set Extension v01 EPP Encoder/Decoder package contains the *EPPStatusSetExtFactory* class. The *com.verisign.epp.codec.statusset.v01.EPPStatusSetExtFactory* must be added to the *EPP.ExtFactories* configuration parameter to support the Status Set Extension v01.
com.verisign.epp.codec.statusset.v02	Use of Status Set Extension v02 EPP Encoder/Decoder package contains the *EPPStatusSetExtFactory* class. The *com.verisign.epp.codec.statusset.v02.EPPStatusSetExtFactory* must be added to the *EPP.ExtFactories* configuration parameter to support the Status Set Extension v02.
com.verisign.epp.interfaces.v01	Includes the *com.verisign.epp.interfaces.v01.EPPStatusSetTst* test class for testing the use of the functional extension in the Status Set Extension v01 against the Stub Server.
com.verisign.epp.interfaces.v02	Includes the *com.verisign.epp.interfaces.v02.EPPStatusSetTst* test class for testing the use of the functional extension in the Status Set Extension v02 against the Stub Server.
com.verisign.epp.serverstub.v01	For the Status Set Extension v01 to be supported by the Stub Server, the *com.verisign.epp.serverstub.v01.StatusSetV01DomainHandler* class and *com.verisign.epp.serverstub.v01.StatusSetV01HostHandler* class must be added to the *EPP.*ServerEventHandlers configuration parameter.

com.verisign.epp.serverstub.v02	For the Status Set Extension v03 to be supported by the Stub Server, the *com.verisign.epp.serverstub.v02.StatusSetV02DomainHandler* class and *com.verisign.epp.serverstub.statusset.v02.StatusSetV02HostHandler* class must be added to the *EPP.*ServerEventHandlers configuration parameter.

13.15.26 Server Validation Extension

The Server Validation Extension provides the status of server validations, such as the server performing DNS or DNSSEC validation that can be done synchronously and returned in the response to a command or done asynchronously and inserted as an EPP poll message.

13.15.26.1 Server Validation Extension Packages

The Server Validation Extension consists of sub-packages of the SDK packages and class additions to existing SDK packages. The following table provides an overview of the extension packages.

Package	Description
com.verisign.epp.codec.serverval.v01	Use of Server Validation Extension v01 EPP Encoder/Decoder package contains the *EPPServerValExtFactory* class. The *com.verisign.epp.codec.serverval.v01.EPPServerValExtFactory* must be added to the *EPP.ExtFactories* configuration parameter to support the Status Set Extension v01.
com.verisign.epp.interfaces.v01	Includes the *com.verisign.epp.interfaces.v01.EPPStatusSetTst* test class for testing the use of the functional extension in the Status Set Extension v01 against the Stub Server.
com.verisign.epp.serverstub.v01	For the Server Validation Extension v01 to be supported by the Stub Server, the *com.verisign.epp.serverstub.v01.ServerValV01DomainHandler* class must be added to the *EPP.*ServerEventHandlers configuration parameter.