



# SSL Custom Application

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SSL Custom Application feature enables users to customize applications that run on any protocol over Secure Socket Layer (SSL), including HTTP over Secure Socket Layer (HTTPS), using the server name, if it exists in the Client Hello extensions, or the common name from the certificate that the server sends to the client.

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

## Information About SSL Custom Application

### Overview of SSL Custom Application

SSL Custom Application feature enables users to customize applications that run on any protocol over Secure Socket Layer (SSL), including HTTP over Secure Socket Layer (HTTPS), using the server name, if it exists in the Client Hello extensions, or the common name from the certificate that the server sends to the client.

HTTP over Secure Socket Layer (HTTPS) is a communication protocol for secure communication. HTTPS is the result of layering HTTP on SSL protocol.

In SSL sub-classification, the rule that ends later in the packet will match. For example, consider the server name ‘finance.example.com’, if there is a rule for ‘finance’ and another rule for example.com, then the rule for ‘example.com’ will match.

## SSL Unique Name Sub-Classification

The SSL unique-name parameter is used to match SSL sessions of servers that are not known globally, or are not yet supported by NBAR. The unique-name matches the server name indication (SNI) field in the client request, if the SNI field exists, or it matches the common name (CN) field in the first certificate of the server's response.

The feature also supports cases of SSL sessions that use session-id than the SSL sessions that use handshake.

The server name is available as part of a HTTPS URL itself. For example, in the URL <https://www.facebook.com>, the server name is [www.facebook.com](https://www.facebook.com). However, the certificate is found in the browser. The user can observe the certificate information by clicking on the HTTPS icon.

The following two figures display the location of the server name and common name as it is visible to the user using Wireshark tool.

The figure below highlights the location of the SNI field:

**Figure 1: Server Name Indication Field**

```

Secure Sockets Layer
├─ TLSv1 Record Layer: Handshake Protocol: Client Hello
│   Content Type: Handshake (22)
│   Version: TLS 1.0 (0x0301)
│   Length: 183
│   └─ Handshake Protocol: Client Hello
│       Handshake Type: Client Hello (1)
│       Length: 179
│       Version: TLS 1.0 (0x0301)
│       └─ Random
│           Session ID Length: 0
│           Cipher Suites Length: 72
│           └─ Cipher Suites (36 suites)
│               Compression Methods Length: 2
│               └─ Compression Methods (2 methods)
│                   Extensions Length: 65
│                   └─ Extension: server_name
│                       Type: server_name (0x0000)
│                       Length: 21
│                       └─ Server Name Indication extension
│                           Server Name list length: 19
│                           Server Name Type: host_name (0)
│                           Server Name length: 16
│                           Server Name: www.facebook.com
│                   └─ Extension: renegotiation_info
│                       Type: renegotiation_info (0xff01)
│                       Length: 1
│                       └─ Renegotiation Info extension
│                   └─ Extension: elliptic_curves
│                       Type: elliptic_curves (0x000a)
│                       Length: 8
│                       Elliptic Curves Length: 6
│                       └─ Elliptic curves (3 curves)
│                   └─ Extension: ec_point_formats
│                       Type: ec_point_formats (0x000b)
│                       Length: 2
│                       EC point formats Length: 1
│                       └─ Elliptic curves point formats (1)
│                   └─ Extension: SessionTicket TLS

```

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The figure below highlights the location of the CN field:

Figure 2: Common Name Field

```

Secure Sockets Layer
├─ TLSv1 Record Layer: Handshake Protocol: Certificate
│   Content Type: Handshake (22)
│   Version: TLS 1.0 (0x0301)
│   Length: 1892
│   └─ Handshake Protocol: Certificate
│       Handshake Type: Certificate (11)
│       Length: 1888
│       Certificates Length: 1885
│       └─ Certificates (1885 bytes)
│           Certificate Length: 976
│           └─ Certificate (id-at-commonName=www.facebook.com,id-at-organizationName=Facebook, Inc)
│               signedCertificate
│               version: v3 (2)
│               serialNumber : 0x3c08cfeebe9feb42bb13ee03d620bdf
│               └─ signature (shawithRSAEncryption)
│                   issuer: rdnSequence (0)
│                   validity
│                   subject: rdnSequence (0)
│                       └─ rdnSequence: 5 items (id-at-commonName=www.facebook.com,id-at-organizationName=Facebook, Inc)
│                           └─ RDNSequence item: 1 item (id-at-commonName=www.facebook.com)
│                               └─ RelativeDistinguishedName item (id-at-commonName=www.facebook.com)
│                                   Id: 2.5.4.3 (id-at-commonName)
│                                   └─ DirectoryString: printableString (1)
│                                       printableString: www.facebook.com
│               subjectPublicKeyInfo
│               extensions: 7 items
│               algorithmIdentifier (shawithRSAEncryption)
│               Padding: 0
│               encrypted: 0d8867ee01442a9146620f6728cc299befe7babcae72cdcf...
│               Certificate Length: 903
│           └─ Certificate (id-at-organizationalUnitName=www.verisign.com/CPS Incorporation)
│               signedCertificate

```

# How to Configure SSL Custom Application

## Configuring SSL Custom Application

### SUMMARY STEPS

1. enable
2. configure terminal
3. ip nbar custom *custom-protocol-name* ssl unique-name *regex* id *selector-id*
4. end

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>ip nbar custom <i>custom-protocol-name</i> ssl unique-name <i>regex id selector-id</i></b> <b>Example:</b> Device (config)# ip nbar custom name ssl unique-name www.example.com id 11	Defines the SSL-based custom protocol match and provides a hostname in the form of a regular expression.  <b>Note</b> The hostname that is configured in this command is found either in the Server Name Indication (SNI) field in the Client Hello extensions or in the Common Name (CN) field in the digital certificate that the server sends to the client.
<b>Step 4</b>	<b>end</b> <b>Example:</b> Router(config)# end	(Optional) Exits global configuration mode.

# Configuration Examples for the SSL Custom Application

## Example: SSL Custom Applications

The following example displays how to configure SSL Custom Application. The hostname that is configured in this command is found either in the Server Name Indication (SNI) field in the Client Hello extensions or in the Common Name (CN) field in the digital certificate that the server sends to the client.

```
Device> enable
Device# configuration terminal
Device(config)# ip nbar custom name ssl unique-name www.example.com id 11
Device(config)# exit
```

## Additional References for SSL Custom Application

### Related Documents for SSL Custom Application

Related Topic	Document Title
Cisco IOS commands	<a href="#">Cisco IOS Master Command List, All Releases</a>
SSL Sub-classification	NBAR Protocol Pack module

### Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for SSL Custom Application

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

**Table 1: Feature Information for SSL Custom Application**

Feature Name	Releases	Feature Information
SSL Custom Application	Cisco IOS XE Release 3.15S	<p>SSL Custom Application feature enables users to customize applications that run on any protocol over Secure Socket Layer (SSL), including HTTP over Secure Socket Layer (HTTPS), using the server name, if it exists in the Client Hello extensions, or the common name from the certificate that the server sends to the client.</p> <p>The following command was introduced or modified:</p> <p><b>ip nbar custom.</b></p>

