



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.

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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. 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-countryName=US)
          RDNSequence item: 1 item (id-at-stateorProvinceName=California)
          RDNSequence item: 1 item (id-at-localityName=Palo Alto)
          RDNSequence item: 1 item (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: 0d8867ee01442a9146620f6728cc299befe7babcae72cdf...
      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
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	ip nbar custom <i>custom-protocol-name</i> ssl unique-name <i>regex id selector-id</i> Example: 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. Note 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.
Step 4	end Example: 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	Cisco IOS Master Command List, All Releases
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.	http://www.cisco.com/cisco/web/support/index.html

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. 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>ip nbar custom.</p>

