



List and briefly define the parameters that define an SSL session state

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## List and briefly define the parameters that define an SSL session state.

The parameters that define an SSL/TLS session state include:

1. Session ID: A unique identifier assigned by the server to a particular SSL/TLS session, which allows the client to resume the session later without the need for a full handshake.
2. Cipher suite: A combination of encryption, hash, and key exchange algorithms used to secure the communication between the client and server.
3. Compression method: A method used to compress the data exchanged between the client and server, if compression is enabled.
4. Peer certificates: Digital certificates used to authenticate the identities of the client and server.
5. Master secret: A secret key generated by both the client and server during the SSL/TLS handshake that is used to derive session keys for encryption and decryption.
6. Client random: A random number generated by the client during the SSL/TLS handshake that is used to derive session keys for encryption and decryption.
7. Server random: A random number generated by the server during the SSL/TLS handshake that is used to derive session keys for encryption and decryption.

These parameters are used to establish and maintain the SSL/TLS session state between the client and server, ensuring secure and authenticated communication.

Suppose a user, Alice, wants to access a secure website that uses SSL/TLS to encrypt the communication between the client and server. When Alice initiates a connection to the server, the SSL/TLS handshake protocol begins.

During the handshake, the server sends its SSL/TLS certificate to Alice, which contains its public key. Alice's web browser verifies the certificate and generates a session ID, a random number that uniquely identifies the SSL/TLS session. The browser also generates a random number, known as the client random, which will be used to derive the session keys for encryption and decryption.

Alice's browser sends the session ID, client random, and the list of supported cipher suites to the server. The server selects a cipher suite from the list that both the client and server support, and sends its own random number, known as the server random, to Alice's browser.

Using the selected cipher suite, the client and server generate a shared secret known as the master secret. This secret is derived from the client random, server random, and the pre-master secret, which is generated by the client and sent to the server encrypted with the server's public key.

Once the master secret is generated, the client and server derive session keys for encryption and decryption using the master secret and the random numbers exchanged during the handshake. The SSL/TLS session is now established and secure, with the session ID, cipher suite, compression method, peer certificates, master secret, client random, and server random defining the session state.

During the remainder of the session, Alice's browser and the server use the derived session keys to encrypt and decrypt data, ensuring that the communication is secure and authenticated.