【CN】Day16

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Materials	Electronic Mail in the Internet
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【Ch2】Application Layer

2.3 Electronic Mail in the Internet

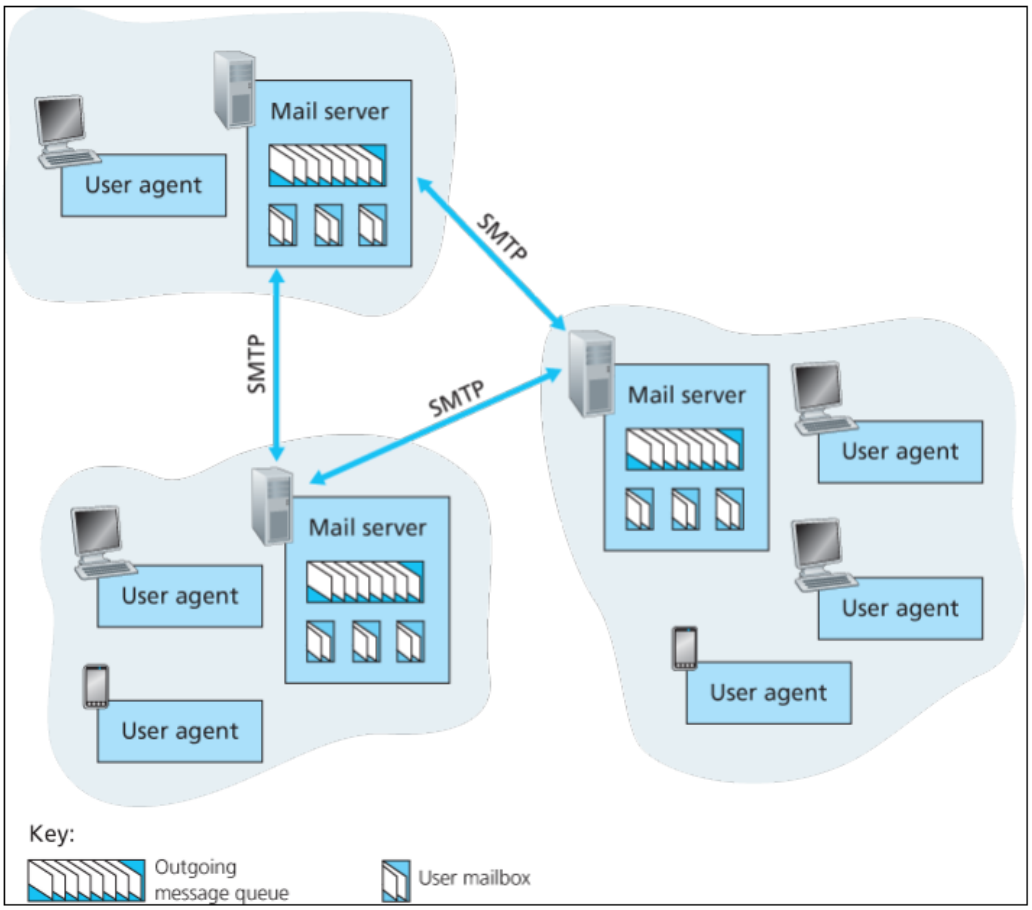

Figure 2.14 A high-level view of the Internet e-mail system

The Internet mail system has three major components: user agents, mail servers, and the Simple Mail Transfer Protocol(SMTP).

When Alice, the sender, finishes composing her message, her user agent sends the message to her mail server, where the message is placed in the mail server's outgoing message queue.

When Bob, the receiver, wants to read a message, his user agent retrieves the message from his mailbox in his mail server.

When Bob wants to access his mailbox, the mail server containing his mailbox authenticates Bob(with usernames and passwords).

If Alice's server cannot deliver mail to Bob's server, it holds the message in a message queue and attempts to transfer the message later, reattempting is done every 30 minute.

SMTP is the principal application-layer protocol for Internet electronic mail. It uses the reliable data transfer service of TCP to transfer mail from the sender's mail server to the recipient's mail server.

Both the client and server sides of SMTP run on every mail server. When a mail server sends mail to other mail servers, it acts as an SMTP client. When a mail server receives mail from other mail servers, it acts as an SMTP server.

2.3.1 SMTP

Suppose Alice wants to send Bob a simple ASCII message.

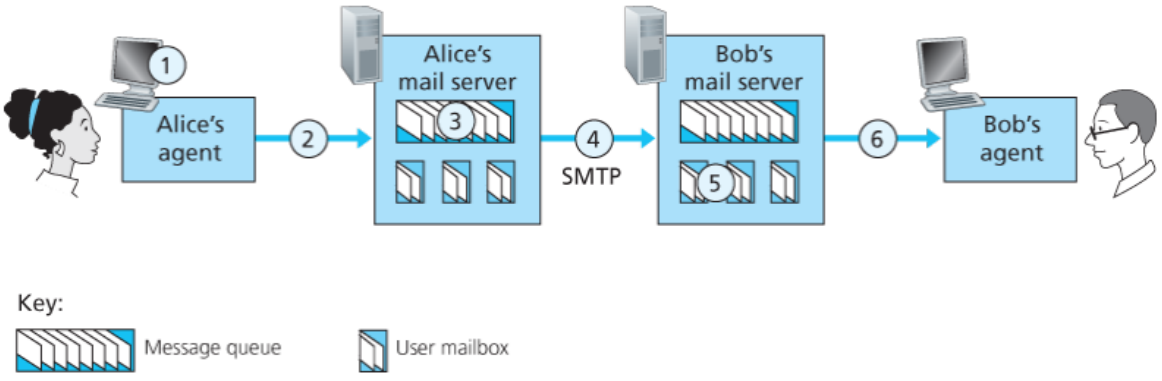

Figure 2.15 Alice sends a message to Bob

1. Alice invokes her user agent for e-mail, provides Bob's e-mail address, composes a message, and instructs the user agent to send the message
2. Alice's user agent sends the message to her mail server, where it is placed in a message queue.
3. The client side of SMTP, running on Alice's mail server, sees the message in the message queue. It opens a TCP connection to an SMTP server, running on Bob's mail server.
4. After some initial SMTP handshaking, the SMTP client sends Alice's message into the TCP connection
5. At Bob's mail server, the server side of SMTP receives the message. Bob's mail server then places the message in Bob's mailbox.
6. Bob invokes his user agent to read the message at his convenience.

Let's see how SMTP transfers a message from a sending mail server to a receiving mail server.

First, the client SMTP has TCP establish a connection to port 25 at the server SMTP. If the server is down, the client tries again later.

Once this connection is established, the server and client perform some application-layer handshaking-just as humans often introduce themselves before transferring information.

Once the SMTP client and server introduces themselves, they send the messages.