Contents

Types Of Servers .................................................................2
Iterative verses Concurrent.....................................................3
Stateless verses Stateful Servers .............................................5
Modes of Operation ................................................................6
POP3 Protocol ........................................................................7
AUTHORIZATION ...................................................................9
TRANSACTION .....................................................................10
UPDATE State ......................................................................12
Optional POP3 Commands .......................................................13

References


Copyright ©, All rights reserved.
2000 SDSU & Roger Whitney, 5500 Campanile Drive, San Diego, CA 92182-7700 USA. OpenContent (http://www.opencontent.org/opl.shtml) license defines the copyright on this document.
Types of Servers

- Connectionless (UDP) verse Connection-Oriented (TCP)
- Iterative verses Concurrent
- Stateless verse stateful
Iterative versus Concurrent

Iterative

Single process

Handles requests one at a time

Good for low volume & requests that are easy to satisfy

Concurrent

Handle multiple requests concurrently

Normally uses thread/processes

Needed for high volume & complex requests

Harder to implement than iterative

Must deal with currency

Create threads/processes

Handle deadlock/livelock issues

How to detect a "bad" thread/process
Single Process/Thread Concurrent Server

One can implement a concurrent server using one thread/process

while (true) {
    check if any new connects (non-block accept)
    if new connection accept
    process a little on each current request
}
Stateless verses Stateful Servers

State information
Information maintained by server about ongoing interactions with clients

Stateless server
Server that does not maintain state information

Stateful server
Server that does maintain state information

State information cause problems

Consumes resources

How long does one maintain the state?
Modes of Operation

Stateful servers sometimes have different modes of operation

Each mode has a set of legal commands

In Login mode only the commands password & username are acceptable

After successful login client-server connection in transaction mode

In transaction mode command X, Y Z are legal

These modes are also called server states or just states
POP3 Protocol

Purpose: Allow PC's, Macs, etc. to download mail from server

Port number 110

Protocol uses ASCII only

Command to server

    keyword blank argument1 [ blank argumentk ] CRLF
    | keyword | = 3, 4 characters
    | argument | <= 40 characters

    keyword and arguments are separated by single space character

Server Response

    Status keyword additionalInfo

    Status is either "+OK" or "-ERR"

A single line response ends in CRLF

If response requires more than one line:

    Each line ends in a CRLF
    The response ends in CRLF.CRLF

    If a line starts with a "." prepend a "." to it
A POP3 server may have an autologout timer

A server must wait at least 10 minutes before timing out a client

The POP3 server on saturn times out in 2 minutes

States

AUTHORIZATION

Must log in with password before entering the transaction state

TRANSACTION

Client can request actions of server, get mail for example

UPDATE

Updates mail box to reflect actions taken in the transaction state
AUTHORIZATION

Server acknowledges connection from client with

+OK "message"

+OK UCB Pop server (version 2.1.2-R3) at saturn starting.

Commands: USER, PASS, APOP, QUIT

USER PASS

Combination of commands are used to progress to the transaction state

USER must come first
PASS or QUIT must come after USER

Example
rohan 14-> telnet saturn 110
Trying 130.191.229.1...
Connected to saturn.sdsu.edu.
Escape character is '^]'.
+OK UCB Pop server (version 2.1.2-R3) at saturn starting.

USER whitney
+OK Password required for whitney.
PASS don'tyouwish
+OK whitney has 21 message(s) (44285 octets).
TRANSACTION

Commands: STAT, LIST, RETR, RSET, QUIT

STAT

Arguments: none
Returns "+OK" numberOfMessages SizeOfMail

Example

```
STAT
+OK 22 45595
```

LIST

Arguments: a message-number ( optional )
Returns: size of message in octets

Examples:

```
LIST 2
+OK 2 3064

LIST
+OK 22 messages (45595 octets)
1 2980
2 3064 ( message 3 - 21 deleted to save space )
22 1290
```

.
RETR

Arguments: a message-number

Returns: the message

Example:

RETR 21
+OK 825 octets

this is a test
..
the end
---

Roger Whitney  Mathematical Science Department
whitney@cs.sdsu.edu  San Diego State University
http://cs.sdsu.edu:8080/~whitney  San Diego, CA 92182-7720
(619) 594-3535
(619) 594-6746 (fax)
DELE

Arguments: a message-number to delete
Returns: a confirmation of deletion
Marks a message to be deleted

NOOP

Arguments: none
Returns: a positive response
Does nothing

QUIT

Arguments: none
Returns: a positive response
Send POP3 server to UPDATE state

UPDATE State

Updates mail box to reflect transactions taken during the transaction state, then logs user out

If session ends by any method except the QUIT command during the transaction state, the update state is not entered
Optional POP3 Commands

**TOP**

Arguments: a message-number

Returns: Top 10 lines of indicated message

State allowed in: transaction

**UIDL**

Arguments: a message-number (optional)

Returns: a unique-id listing for message

State allowed in: transaction

Examples:

**UIDL 1**

+OK 1 826312760.001

**UIDL**

+OK uidl command accepted.
1 826312760.001
2 826312760.006
3 826493796.004
4 826510843.001
5 826510843.002
6 826576073.000
7 826594928.004
8 826603475.000
9 826648617.001
10 826648617.002
APOP

Arguments: a mailbox and a MD5 digest string

State allowed in: authorization

Action: If MD5 string is correct move to transaction state