1. Do something that triggers Client need to interact with Printer
2. Formulate IPP operation request payload (application/ipp)
3. Perform HTTP POST of request payload
4. POST /ipp/print HTTP/1.1
   Content-Type: application/ipp
   Expect: 100-continue
5. HTTP/1.1 100 Continue
6. << Send the application/ipp payload >>
7. Deliver IPP operation request
8. Formulate IPP operation response
9. Return IPP operation response
10. HTTP/1.1 200 OK
    Content-Type: application/ipp
11. Deliver the IPP operation response
12. Process the operation response
13. Present something from the operation response(s)
14. Done
IPP Client

HTTP User Agent

HTTP Service

IPP Printer

Authorization Service

User

Do something that triggers Client need to interact with Printer

2. Formulate IPP operation request payload (application/ipp)

3. Perform HTTP POST of request payload

Start HTTP Basic Authentication = HTTP/1.1 401 Unauthorized

WWW-Authenticate: Basic realm="User Visible Realm"

Request authentication

Provides credentials

Retry with provided credentials

POST /ipp/print HTTP/1.1
Content-Type: application/ipp
Expect: 100-continue
Authorization: Basic QWxhZGRpbjpPcGVuU2VzYW1l

Check access with local auth database

Check access with external auth database

Approve Access

End HTTP Basic Authentication = HTTP/1.1 100 Continue

Deliver IPP operation request

Formulate IPP operation response

Deliver IPP operation response

HTTP/1.1 200 OK
Content-Type: application/ipp

Deliver the IPP operation response

Process the operation response

Present something from the operation response(s)

Done
IPP Authentication Using HTTP Digest Authentication

1. Do something that triggers Client need to interact with Printer

2. Formulate IPP operation request payload (application/ipp)

3. Perform HTTP POST of request payload

4. HTTP POST /ipp/print HTTP/1.1
   Content-Type: application/ipp
   Expect: 100-continue

5. HTTP/1.1 401 Unauthorized
   WWW-Authenticate: Digest realm="testrealm@host.com",
   qop="auth,auth-int",
   nonce="dcd98b7102327f9eb119df608b0c093",
   opaque="5c039b6e59e6f0f2175d9174ae41"

6. Request authentication

7. Request authentication

8. Provides credentials

9. Retry with provided credentials

10. HTTP POST /ipp/print HTTP/1.1
    Content-Type: application/ipp
    Expect: 100-continue
    Authorization: Digest username="Mufasa",
    realm="testrealm@host.com",
    qop="auth",
    nc=0000001,
    cnonce="0a4f113b",
    response="6629fae49393a05397450978507c4ef1",
    opaque="5c039b6e59e6f0f2175d9174ae41"

11. Check access with local auth database

12. Check access with external auth database

13. Approve Access

14. HTTP/1.1 100 Continue

15. <<< Send the application/ipp payload >>>

16. Deliver IPP operation request

17. Formulate IPP operation response

18. Return IPP operation response

19. HTTP/1.1 200 OK
    Content-Type: application/ipp

20. Deliver the IPP operation response

21. Process the operation response

22. Present something from the operation response(s)

23. Done
IPP Authentication Using HTTP OAuth2 Authentication

**User**
1. Do something that triggers Client need to interact with Printer

**IPP Client**
2. Formulate IPP operation request payload (application/ipp)
3. Perform HTTP POST of request payload

**HTTP User Agent**
4. POST /ipp/print HTTP/1.1
   Content-Type: application/ipp
   Expect: 100-continue

**HTTP Service**
5. HTTP 302 Found
   Location: http://AuthService.foo.com/auth/

**Authorization Service**
6. HTTP GET authentication UI
   HTTP/1.1 200 OK
   respond with authentication UI page content

**HTTP User Agent**
7. Show authentication UI page content

**User**
8. View authentication UI page content
9. Enter credentials
10. Submit credentials

**Authorization Service**
11. POST the credentials form
12. HTTP 302 redirect to redirection endpoint
13. Check credentials and accept
14. HTTP 302 redirect to original URL (IPP URL)
15. GET auth grant exchanged
16. POST request access token
17. HTTP 200 OK with access token

**HTTP Service**
18. POST /ipp/print HTTP/1.1
   Content-Type: application/ipp
   Expect: 100-continue

**Authorization Service**
19. HTTP 302 redirect to original URL (IPP URL)
20. HTTP 100 Continue

**HTTP User Agent**
21. << Send the application/ipp payload >>

**Authorization Service**
22. Deliver IPP operation request
23. Formulate IPP operation response
24. Return IPP operation response

**HTTP Service**
25. HTTP/1.1 200 OK
   Content-Type: application/ipp

**HTTP User Agent**
26. Deliver the IPP operation response
27. Process the operation response

**User**
28. Present something from the operation response(s)
29. Done
IPP Authentication Using HTTP OAuth2 and HTTP Digest

Client System

1. Do something that triggers Client need to interact with Printer

IPP Client

2. Formulate IPP operation request payload (application/ipp)

HTTP User Agent

3. Perform HTTP POST of request payload

POST /ipp/print HTTP/1.1
Content-Type: application/ipp
Expect: 100-continue

Print Service System

4. Content-Type: application/ipp
Expect: 100-continue

Start HTTP OAuth2 Authentication with HTTP Digest =

User

5. HTTP 307 Temporary Redirect
Location: http://AuthService.foo.com/auth/

HTTP Service

6. GET authentication UI

HTTP/1.1 401 Unauthorized
WWW-Authenticate: Digest realm="testrealm@host.com",
qop="auth,auth-int",
nonce="dcd98b7102d2d0e6b11d0006bb833d93",
opaque="5ccc069c403ebaf9f0171e9517f40e41"

7. Request authentication

Authorization Service

8. Request authentication

GET authentication HTTP/1.1
Content-Type: application/ipp
Expect: 100-continue
Authorization: Digest username="Mufasa",
realm="testrealm@host.com",
qop="auth,auth-int",
nonce="dcd98b7102d2d0e6b11d0006bb833d93",
uri="/ipp/print",
ippauth,
nc=00000001,
cnonce="0a4f113b",
response="6629fae49393a05397450978507c4ef1",
opaque="5ccc069c403ebaf9f0171e9517f40e41"

IPP Printer

9. Provides credentials

10. Retry with provided credentials

11. HTTP 302 redirect to redirection endpoint

END HTTP OAuth2 Authentication with HTTP Digest =

12. HTTP 302 redirect to original URL (IPP URI)

POST /ipp/print HTTP/1.1
Content-Type: application/ipp
Expect: 100-continue

13. HTTP 200 OK with access token

14. HTTP 302 redirect to original URL (IPP URI)

15. POST request access token

16. HTTP 200 OK with access token

17. POST /ipp/print HTTP/1.1
Content-Type: application/ipp
Expect: 100-continue

18. IPP operation request

19. HTTP/1.1 100 Continue

20. Deliver IPP operation request

21. Deliver IPP operation response

22. Formulate IPP operation response

23. Return IPP operation response

24. HTTP/1.1 200 OK
Content-Type: application/ipp

25. Deliver the IPP operation response

26. Process the operation response

27. Present something from the operation response(s)

28. Done