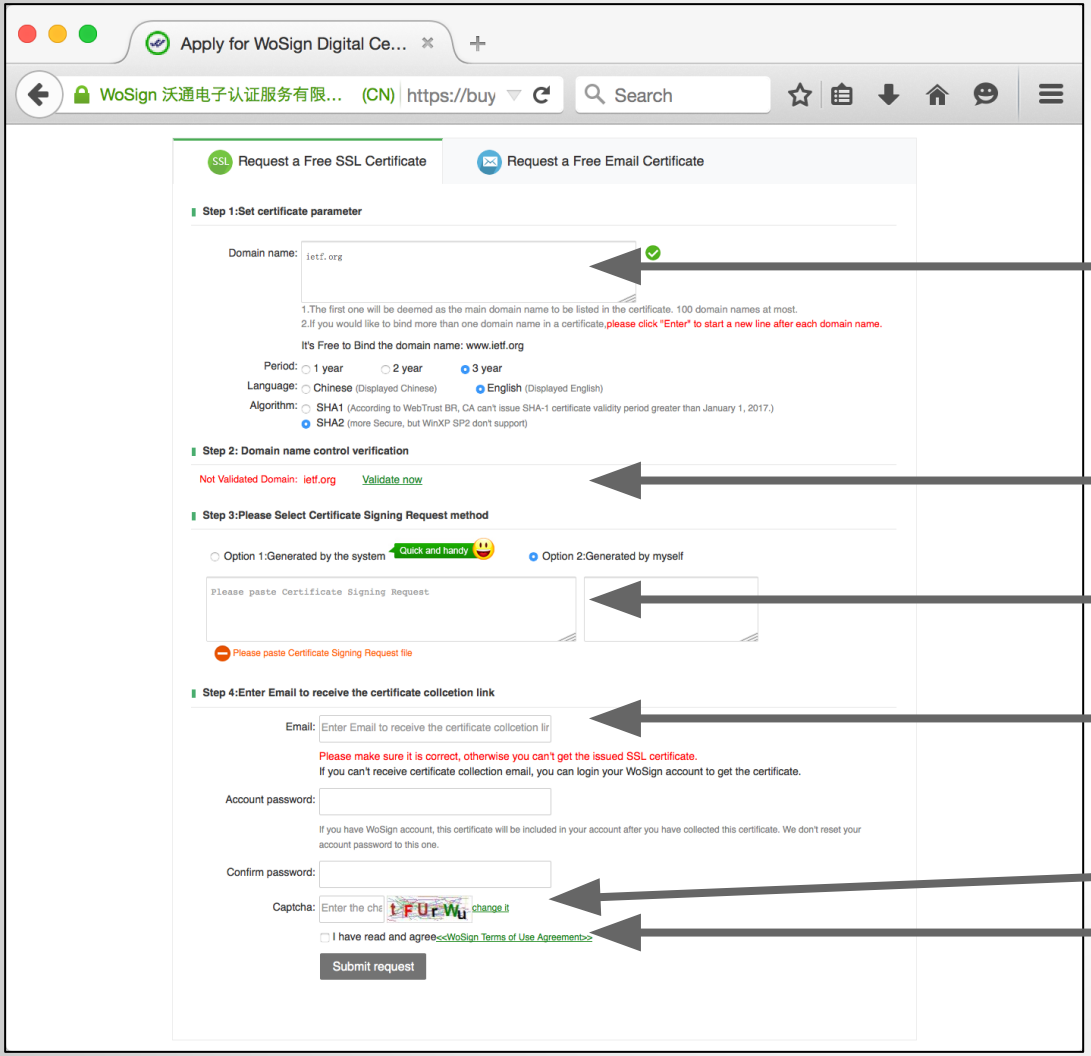
draft-barnes-acme



Requirements

https://buy.wosign.com/free/

Domain name
(other cert. contents)

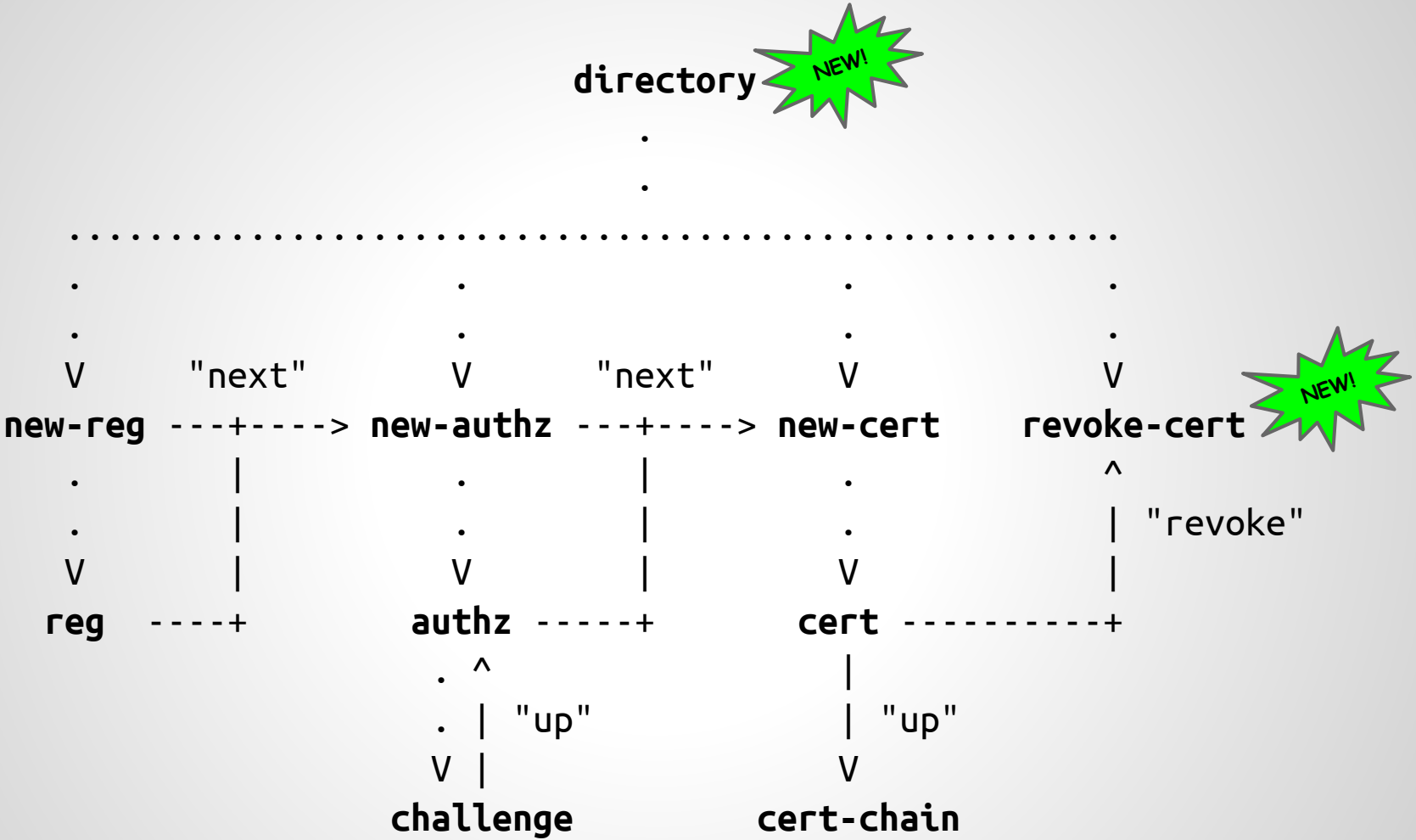
Verify domain control

PKCS#10 CSR

Contact + auth

CAPTCHA?

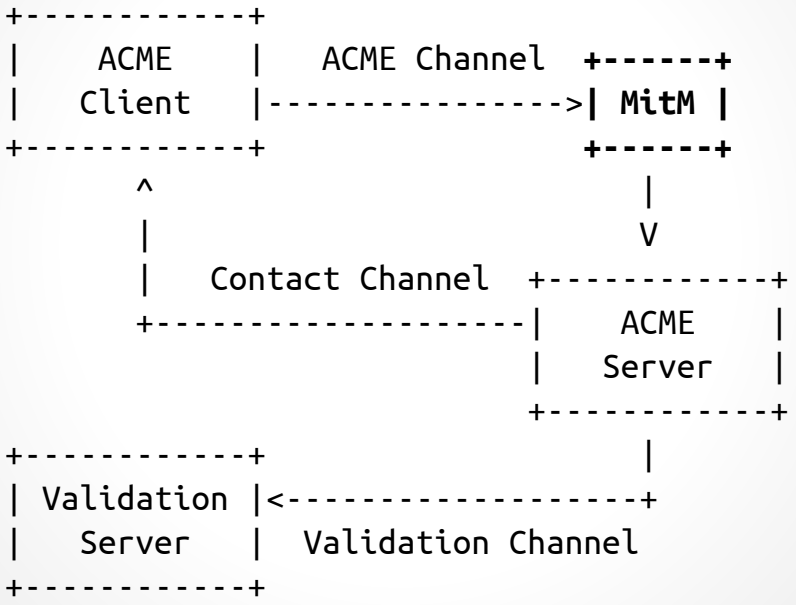
Subscriber Agreement


directory
NEW!
"next"
"next"
new-reg
new-authz
new-cert
revoke-cert
NEW!
"revoke"
reg
authz
cert
"up"
"up"
challenge
cert-chain

Cert management functions

- Register an account
- Authorize the account for an identifier
  - Including validation of control of the identifier
- Issue certificates
- Revoke certificates
- Recover an account

Threat Model



Directory


```
GET /acme/directory HTTP/1.1
Host: example.com
```

```
HTTP/1.1 200 OK
Content-Type: application/json

{
  "new-reg": "https://example.com/acme/new-reg",
  "recover-reg": "https://example.com/acme/recover-reg",
  "new-authz": "https://example.com/acme/new-authz",
  "new-cert": "https://example.com/acme/new-cert",
  "revoke-cert": "https://example.com/acme/revoke-cert"
}
```

Registration

```
POST /acme/new-reg HTTP/1.1
Host: example.com

{
  "contact": [
     "mailto:cert-admin@example.com",
     "tel:+12025551212"
  ],
  "agreement": "https://example.com/terms"
}
/* Signed as JWS with account key pair */
```

```
HTTP/1.1 201 Created
Content-Type: application/json
Location: https://example.com/reg/asdf

{
  "contact": /* copied */,
  "agreement": /* copied */,
  "key": /* JWS signature key */,
  "authorizations": "...",
  "certificates": "..."
}
```

Authorization

```
POST /acme/new-authz HTTP/1.1
Host: example.com

{
  "identifier": {
     "type": "domain",
     "value": "example.org"
  }
}
/* Signed as JWS */
```

```
HTTP/1.1 201 Created
Content-Type: application/json
Location: https://example.com/authz/asdf

{
  "status": "pending",
  "identifier": {
     "type": "domain",
     "value": "example.org"
  },
  "key": { /* JWK from JWS header */ },
  "challenges": [ /* next slide */ ],
}
```

Challenges

```
/* Challenge: CA ---> Applicant */
{
  "type": "simpleHttps",
  "uri": "https://example.com/authz/asdf/0",
  "token": "IlirfxKKXAsHtmzK29Pj8A"
}
```

To prove you control `example.org` please sign a JWS over **`IlirfxKKXAsHtmzK29Pj8A`** and put it in the directory `.well-known/acme-challenge/`


```
/* Response: Applicant ---> CA */
{
  "tls": false
}
/* Signed as JWS */
```

OK, I provisioned it on **`http:`**`//example.org/`

Also: DVSNI, DNS, Proof of Possession

Certificates

```
POST /acme/new-cert HTTP/1.1
Host: example.com
Accept: application/pkix-cert

{
  "csr": "5jNudRx6Ye4H...FS6aKdZeGsyso",
}
/* Signed as JWS */
```

```
HTTP/1.1 201 Created
Location: https://example.com/acme/cert/asdf
Content-Length: 0

--- then ---

HTTP/1.1 202 Accepted
Content-Length: 0

--- then ---

HTTP/1.1 200 OK
Content-Type: application/pkix-cert

[DER-encoded certificate]
```

Revocation


```
POST /acme/revoke-cert HTTP/1.1
Host: example.com

{
  "resource": "revoke-cert",
  "certificate": "[DER-encoded cert]
"
}
/* Signed as JWS */
```

```
HTTP/1.1 200 OK
Content-Length: 0

--- or ---

HTTP/1.1 403 Forbidden
Content-Type: application/problem+json
Content-Language: en

{
  "type": "urn:acme:error:unauthorized"
  "detail": "No authorization for example.net"
  "instance": "http://example.com/doc/unauthorized"
}
```

Recovery


```
POST /acme/recover-reg HTTP/1.1
Host: example.com

{
  "resource": "recover-reg",
  "method": "contact",
  "base":"https://example.com/acme/reg/asdf",
  "contact": [
    "mailto:forgetful@example.net"
  ]
}
/* Signed as JWS, with new account key */
```

```
HTTP/1.1 201 Created
Content-Type: application/json
Location: https://example.com/acme/reg/qwer

{
  "key": { /* new account key from JWS */ },
}

--- then ---

HTTP/1.1 200 OK
Content-Type: application/json
Location: https://example.com/acme/reg/qwer

/* Full registration object */
```

Summary

```
POST new-registration ———————— registration + agreement URL
POST registration + agreement —— OK

POST new-authorization ———————— authorization + challenges
POST challenge + response ——— accepted
GET authorization ———————— authorization valid

POST new-certificate ———————— certificate URI ——— certificate
POST revoke-certificate ———————— OK
POST new-certificate ———————— stub-reg ———————— registration
```

Questions

What do you like?

What do people hate?

Should the WG adopt this document?

Links

Specification:

https://tools.ietf.org/html/draft-barnes-acme-03

https://github.com/letsencrypt/acme-spec

Implementation:

https://github.com/letsencrypt/boulder