

HOW TO INSTALL A CUSTOM CERTIFICATE AUTHORITY USING `cmc_cert_util`

Some customers may wish to change the self-signed certificate used by the Unitrends web interface to be a custom certificate that fits their security environment. Often this involves using a third-party Certificate Authority. This information shows how to do that for Unitrends systems, using the `cmc_cert_util` script which is included with `unitrends-rr-9.0.0` and later rpms.

Note that you should change your default hostname to whatever you wish BEFORE starting this process, since the certificate is dependent upon the hostname. Use your hostname wherever you see 'VMware_UEB' in the example below.

An example for the signing sequence using a third-party Certificate Authority with `cmc_cert_util`:

- 1) Create the Certificate Signing Request (CSR)
- 2) Verify the CSR
- 3) Submit the Certificate Signing Request file (*.csr) to your Certificate Authority (CA).
- 4) Examine the returned signed certificate (.crt or .cer extension, and optional .p7b chain file).
- 5) Install the returned certificate with "`cmc_cert_util install`".
- 6) Verify that the system is using the new Certificate.

1) Create the Certificate Signing Request

```
[root@VMware_UEB]# cmc_cert_util req -v -p
Create the Signing Request:
Private Key File: VMware_UEB.key
Signing Req File: VMware_UEB.csr
```

```
-----BEGIN CERTIFICATE REQUEST-----
MIIDKzCCAQMCAQAwDELMAkGA1UEBhMCVVMxZzAVBgNVBAGTDlNvdXRoIENhcm9s
aW5hMREwDwYDVQQHEWhDb2x1bWJpYTESMBAGA1UEChMJVW5pdHJlbmRzMQRwEgYD
VQQLewtFbmdpbmVlcmcluzZETMBEGA1UEAxQKVk13YXJlX1VFQjCCASIwDQYJKoZI
hvcNAQEBBQADggEPADCCAQoCggEBAN0NG1FzcV5YUfOcGwu/wlLIVSTenVO2GPoz
F8WeGCWacQEurForxocXvt6nJ8RR6Zjxb5gni6N/kqdp2cjtP1T4erRShm5mYCFb
VzkSrlFAGIr8F36n3j1AVBwbT/NG65x66nFz7Yhs/zaOH+/s7Y1tuSkNUQsiqzil
8g7yeAM1063uxydPNyJXS9WXbrqNSAxxaBuR/GpQOaNIcNgQ9J1cMhItlymyU7c
ssrGojUsOm0R6iDUA1E4WqCdXuRuegUK/mFlzG/eE5FfT4ZLKpX1cOSW2McQpE1C
dbyRDDLJ/T2T4lnNDdpEbVU5vVMmNmX+zKFvMUZaP4OZhliDnQUCAwEAAaBuMGwG
CSqGSib3DQEJDjFfMF0wCQYDVROTBAlwADALBgNVHQ8EBAMCBeAwQwYDVRORBdww
OocECmRkBocErBEDCocEwKi7UIIaVkl3YXJlX1VFQj5pbWllZC1zYnMubG9jYWyC
ClZNd2FyZV9VRUwDQYJKoZIhvcNAQELBQADggEBAHJJa0PKTehnvK0490JzxfJ+
8YrOnxYLVF9JJeAQmxnC4JKMPtykkx0SdHEvODFAZ9VC+fgw5Gi+4u30IF8JD/Z/
Zfpw86IZg8vApw8rd4DGc5glMF1uYtp2d2gtsiGrjDbayVVBTLaboMCLCZxGbU/Y
Xla+o4/AXXcCM+vn0g7oALdSoibsy4E25xVZDQ/afaR01/O7vfho9ErKNEwt8DFm
7FSH76dPmAp3/okopJA6unI7iHoWxyjQoyLpZ8oOZxAA9Z0zK15Wv8jWiWV4wGak
6zlBT+uqgBFASBZK0p0IJgo5AGUxUjPu+t9ZnlffCk19aXfAd26JITiYlgePqa8=
-----END CERTIFICATE REQUEST-----
```

2) Verify the CSR

At this point the Certificate Signing Request appears above between the "BEGIN/END" delimiters. It is also written to the file `<hostname>.csr`. In this case, the hostname is `VMware_UEB`. The contents of the CSR include both the unqualified hostname (`VMware_UEB`), the FQDN (`VMware_UEB.immed-sbs.local`) and the IPv4 addresses reported by '`hostname -I`'.

If we run `cmc_cert_util info` (with and without `-v`) on the newly generated CSR we get:

```
[root@VMware_UEB]# cmc_cert_util info VMware_UEB.csr
Key File   : /etc/pki/tls/private/localhost.key
Cert File  : /etc/pki/tls/certs/localhost.crt
Chain File :
subject=
  commonName           = VMware_UEB
  organizationalUnitName = Engineering
  organizationName      = Unitrends
  localityName          = Columbia
  stateOrProvinceName   = South Carolina
```

countryName = US

```
[root@VMware_UEB]# cmc_cert_util info -v VMware_UEB.csr
```

Key File : /etc/pki/tls/private/localhost.key

Cert File : /etc/pki/tls/certs/localhost.crt

Chain File:

Subject: C=US, ST=South Carolina, L=Columbia, O=Unitrends,
OU=Engineering, CN=VMware_UEB

Attributes:

Requested Extensions:

X509v3 Basic Constraints:

CA:FALSE

X509v3 Key Usage:

Digital Signature, Non Repudiation, Key Encipherment

X509v3 Subject Alternative Name:

IP Address:10.100.100.6, IP Address:172.17.3.10, IP
Address:192.168.187.80, DNS:VMware_UEB.immed-sbs.local, DNS:VMware_UEB

3) Send the CSR to the Certificate Authority.

We have a CA running locally with a CURL interface that we can submit CSRs and get back the signed certificate and the CA certificate. This can be done either using the CA server's web interface, or sometimes via the command-line.

A) Request Certificate from CA Server

----- The following instructions may vary depending on how the user's specific certificate authority works

It is also assumed that the Certificate Authorities Trusted Root Certificates are installed on the clients that will be accessing the DPU ----

You may be fortunate enough to be able to upload the entire **<hostname>.csr** file to your certificate authority. However, if not, the user may be required to extract the "BEGIN...END" portions and submit this to the CA as per the following commands:

1. Edit/display the **<hostname>.csr** file.
2. Highlight the text on the screen, including the Begin Certificate Request and End Certificate Request lines, and Copy the text from that window
3. Open a browser window.
4. Enter https://<CA_host>/certsrv in the address bar where **<CA_host>** is replaced by the hostname of the certificate server.
5. A Login window should open. Enter an Enterprise Admin account username and password and hit enter.
6. Paste the text of the **<hostname>.csr** file, including the "BEGIN" and "END" lines into the window.
It is important that the "BEGIN CERTIFICATE REQUEST" and "END CERTIFICATE REQUEST" lines are included in the copied and pasted text.
7. Switch the certificate template to web server and select **Submit**.
The web menu should look something like this example.


```
BgNVBAGTD1NvdXR0IENhcm9saW5hMREwDwYDVQQHEWhDb2x1bWJpYTESMBAGA1UE
ChMJVW5pdHJlbnRzMQRwEgYDVQQLewtFbmdpbmVlcmluZzETMBEGA1UEAxQKVk13
YXJlX1VfQjCCASiWdQYJKoZIhvcNAQEBBQADggEPADCCAQoCggEBANDnIbhet9WR
Kx0qkRWI753DDLVfK4PHdzyQBY6N1n2kQeEGUYsClRD3FHW/zS/ycTtRkqJlWxMP
LPh9hW158odOoDIB/XD03bBSdVdbcGmTgtadMSg+w3GYdRGciZ9zWFEaujK4v0JpJ
rXprpboGUAWat75+/t8S5cGAE1C/Alu5zD+ukrFtWbCi/xPoBYDVMT8fj1XTH7pi
SHWCdu2qKS5UDO/370xZhW2KuMqpeEjUAV9PbodCIyJVhpkAG+Xa+Yc3ZIDM1lpD
kdRx0fP6TyZa4dRQa5SASUyocks+457ika+Jh+5h9yLMxgb8F8OnHVCsmz3bKZxM
cFKbq/1IdZkCAwEAaOBoDCBnTAdBgNVHQ4EFgQU80hH6WKf/AVhgh3Mp2m3pJr/
e+0wHwYDVR0jBBGwFoAUsjUerU4Ix5tPpum52vtDqdZ3N88wCQYDVR0TBAlwADAL
BgNVHQ8EBAMCAQYwQwYDVR0RBDwwOocECmRkBocErBEDCocEwKi7UIIaVkl3YXJl
X1VfQj15pbW11ZC1zYnMubG9jYWYCClZND2FyZV9VRUIwDQYJKoZIhvcNAQELBQAD
ggIBAEQOfw8GaUPgVaZGAW8X3h7TX6z83SoSGedKXsKTNjWPifzSi3dbPB/bdvwm
rsJy7QaLi9w6AZ9brcyEieynvGEUDH51BLnBOOGzBDAaafP0QBwV3TUHuCCwRAM9
YHZLF6H1SyYRPx195maexjwKYh9yffXqJcyYv/RlUutBEjYlEaVlU0t+ETYouVT1
TKgdXZl9D8gq0lF9oOV3515s8jflkDcFet3wcZ1060WDCh5DKjFqmbmcU8kiGaG
jeaMueRT9rDT2X3RtrMIPIHcyFEzWM14pZUHIleCOIwzaLgLPu8S9MURak1DMFn
lFMSap63EaDDputwn/VU12mWHVB7xxSD4asJpf5s3AuW9UAIsdohavb3m7xK5JQE
eLn31SmHuY/V7Zpc0JMDIySVaHF181Ytu6JfbCe960HyjFb6l8oqPRg2KUUGgoBB
K/lKlQ4X9lDtiCFVagLEIUzZxyL51luddUcRmMyUMHY11lVlcSdiwDPNNyZntk00
zDCeDfLl/ZlnjowcaZL/qdW3r3tlyIerZrxNQ+YNNgy5fJTH2G7zU2rme+cjIM6x
82lMEBz30K7BkuJ2iPV88qI6zNosFIjNeO8Qj1MeFggPDWycCdjYDSMoUb8Nboua
EKrQEC5dloGUjdfw/fpIpTbrSPitzp4ncNvujuhSvhi+SHd
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIIGFjCCA/6gAwIBAgIJAKNDGqOnXK3hMA0GCSqGSIb3DQEBCwUAMIGAMQswCQYD
VQQGEwJVUzEXMBUGA1UECAwOU29ldGggQ2Fyb2xpbmExETAPBgNVBACMCENvbHVt
YmlhMRlWwEAYDVQQKDAlVbml0cmVlZHMxZDAsBgNVBAsMC0VU22luZWVyaW5nMRIw
EAYDVQQDDAlVbml0cmVlZHMxZTAfBgkqhkiG9w0BCQEWEmJ1enpAdW5pdHJlbnRz
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MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIw
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YzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUw
OTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0
MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgy
MTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4
MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIw
YzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUw
OTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0
MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgy
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MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIw
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OTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0
MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgy
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YzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUw
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MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgy
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OTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0
MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgy
MTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4
MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIw
YzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUw
OTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0
MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgy
MTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4
MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIw
YzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUw
OTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0
MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgy
MTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4
MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIw
YzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUw
OTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0
MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgy
MTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4
MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIw
YzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUw
OTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0
MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgy
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MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIw
YzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUw
OTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0
MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgy
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MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIw
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MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgyMTE4MjIwYzUwOTM0MDgy
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YzUwOTM0MDgyMTE4MjI
```

```

    Serial Number: 4145 (0x1031)
    Signature Algorithm: sha256WithRSAEncryption
    Validity
        Not Before: Jun  1 18:27:46 2015 GMT
        Not After : May 31 18:27:46 2016 GMT
    Subject: C=US, ST=South Carolina, L=Columbia, O=Unitrends,
    OU=Engineering, CN=VMware_UEB
    X509v3 extensions:
        X509v3 Subject Key Identifier:
            9D:C3:EE:35:32:8F:31:09:C7:9E:AE:12:ED:E7:C6:7D:5C:B1:9C:4D
        X509v3 Authority Key Identifier:
            keyid:B2:35:1E:AD:4E:08:C7:9B:4F:A6:E9:B9:DA:FB:43:A9:DC:F7:37:CF
        X509v3 Basic Constraints:
            CA:FALSE
        X509v3 Key Usage:
            Certificate Sign, CRL Sign
        X509v3 Subject Alternative Name:
            IP Address:10.100.100.6, IP Address:172.17.3.10, IP
            Address:192.168.187.80, DNS:VMware_UEB.immed-sbs.local, DNS:VMware_UEB

```

5) Install the returned certificate.

The above blob was saved to VMware_UEB.crt (Note: it could have simply redirected the output from the script, but we wanted to show it on <stdout>. Now it can be installed, overwriting the existing entries. The '-v' option clarifies what's going on. Note that we also specified the restart of the web server.

Note that the *.key file generated in step 1 above must be in the current directory as well.

```

[root@VMware_UEB]# cmc_cert_util install -v -r -o VMware_UEB
Performing the following steps:
    Copy VMware_UEB.crt to /etc/pki/tls/certs/localhost.crt
    Copy VMware_UEB.key to /etc/pki/tls/private/localhost.key
Is this correct (y/[n])? :y
Copying VMware_UEB.crt to /etc/pki/tls/certs/localhost.crt
Copying VMware_UEB.key to /etc/pki/tls/private/localhost.key
Checking web server configuration...Syntax OK
(Re)starting web server...

```

6) Verify that the system is using the new certificate.

Next we login to the system and examine the certificate presented to the browser. Check the time in the 'Valid from' field. It corresponds exactly to the time we saw when we examined the Signed certificate (accounting for EDT/GMT difference, of course).

Below is the complete usage for the cmc_cert_util script.

```

===== cmc_cert_util USAGE =====
usage: cmc_cert_util req [-h] [-v] [-p] [-d <dnsname> ...] [-i <ip_adress>...]
[-e email address ] [-k <keybits>] [<prefix>]
    -h print this message                [false]
    -v print additional information       [false]
    -d subjectAlternate Name DNS         []
    -i subjectAltname IP                 []
    -e email address                     []
    -k bits in private key                [2048]
    -K <KEYFILE>                         []
    -p Prompt for C,ST,L,O,OU            [false]
    -s Self Sign the certificate          [false]
        output file <prefix>             [VMware_UEB]

usage: cmc_cert_util install [-h] [-v] [-r] [-y] -o | -n -d <cert directory>
[<prefix>]
    -h Print this message                [false]

```

```

-v Print additional information [false]
-r Restart web server           [false]
-y Execute without prompt       [false]
-o Overwrite existing cert/key  [false]
-n Instantiate as new cert/key  [true]
-d Directory for new certs      []
  input file <prefix>           [VMware_UEB]

```

usage: cmc_cert_util restore [-h] [-v] [-r] -o | -l -y

```

-h Print usage
-v Verbose [false]
-r Restart web server [false]
-y Confirm restore (required!)
-o Original configuration [false]
-l Last saved configuration [true]

```

usage: cmc_cert_util info [-h] [-v] [<prefix>]

REQ DETAILED USAGE (-v option):

```
[root@VMware_UEB]# cmc_cert_util req -hv
```

usage: cmc_cert_util req [-h] [-v] [-p] [-d <dnsname> ...] [-i <ip_adress>...] [-e email address] [-k <keybits>] [<prefix>]

```

-h print this message           [true]
-v print additional information [true]
-d subjectAlternate Name DNS    []
-i subjectAltname IP           []
-e email address                []
-k bits in private key          [2048]
-K <KEYFILE>                    []
-p Prompt for C,ST,L,O,OU      [false]
-s Self Sign the certificate     [false]
  output file <prefix>         [VMware_UEB]

```

req (create new signing request)

Generate a new private key of size 2048 bits and create

the x509 certificate signing request using this key

The .key and .csr files are named according to the <prefix> (default: system hostname)

Use -K to specify the full path to an existing private key file

Use -s to self sign the certificate

An arbitrary number of DNS names and IP addresses may be included by specifying addition -d or -i parameters. These will be included

in the signing request in the 'subjectAltName' section.

INSTALL DETAILED USAGE:

```
[root@VMware_UEB]# cmc_cert_util install -vh
```

usage: cmc_cert_util install [-h] [-v] [-r] [-y] -o | -n -d <cert directory> [<prefix>]

```

-h Print this message           [true]
-v Print additional information [true]
-r Restart web server           [false]
-y Execute without prompt       [false]
-o Overwrite existing cert/key  [false]
-n Instantiate as new cert/key  [true]
-d Directory for new certs      []
  input file <prefix>           [VMware_UEB]

```

install (install new, signed certificate)

Install the newly signed certificate (and optional certificate chain) on the local appliance.

Optionally, restart the web server if so instructed.

If overwriting the existing certificate and private key, the destination filename are derived from entries in the /etc/httpd/conf.d/ssl.conf file.

If instantiating a new certificate and key, the /etc/httpd/conf.d/ssl.conf file is updated to point to the new files. Web server must be restarted before this takes effect.

RESTORE DETAILED USAGE:

```
[root@VMware_UEB]# cmc_cert_util restore -hv
usage: cmc_cert_util restore [-h] [-v] [-r] -o | -l -y
-h      Print usage
-v      Verbose [true]
-r      Restart web server [false]
-y      Confirm restore (required!)
-o      Original configuration [false]
-l      Last saved configuration [true]
```

restore

Restores the configuration to either the latest saved configuration or the original settings.

INFO DETAILED USAGE:

```
[root@VMware_UEB]# cmc_cert_util info -hv
```

```
usage: cmc_cert_util info [-h] [-v] [<prefix>]
info
```

Print relevant fields from the named certificate or current certificate if not specified.