

# HP LaserJet Pro Devices – Installing 2048 bit SSL certificates

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## Disclaimer

This document makes reference to certain products and/or services provided by third parties. These references are provided for example and demonstration purposes only and are not intended as an endorsement of any products, services, or companies.

## Introduction

A recent publication of the National Institute of Standards and Technology (**NIST Special Publication 800-131A**) announced that the use of 1024 bit SSL/TLS certificates is no longer recommended and will be "disallowed" after December 31, 2013. The publication recommends the use of 2048 bit certificates to maintain network security and integrity. As a result, most Certificate Authorities (CAs) will no longer issue 1024 bit certificates. And, most Web browsers will no longer honor such certificates as safe and secure. In order to avoid error messages and the risk of a security breach, systems and devices that rely on the SSL/TLS protocols will need to have 2048 bit Certificates installed.

Most HP LaserJet printers can accept a 2048 bit certificate but some cannot generate the request needed to obtain one. This white paper will describe methods that can be used to obtain and install a 2048 bit certificate for such products. For more detailed information on the SSL/TLS protocols and the use of certificates to provide Internet safety and security, see "**HP Jetdirect and SSL/TLS**".

There are three steps to this process:

- 1. Generate a Certificate Signing Request (CSR) for the printer
- 2. Obtain the certificate from a Certificate Authority (CA)
- 3. Import the certificate and private key into the printer

## **Generating a Certificate Signing Request**

### The normal process

Ordinarily, a certificate is obtained from a Certificate Authority (CA) by submitting a "Certificate Signing Request" (CSR). This is a base 64 encoded text file which contains all the information needed by the CA to generate a certificate.

```
----BEGIN NEW CERTIFICATE REQUEST----
MIICyDCCAbACAQAwqYIxCzAJBqNVBAYTAkFOMREwDwYDVQQIEwhBbnlzdGF0ZTEQ
MA4GA1UEBxMHQW55dG93bjEOMAwGA1UECxMFU2FsZXMxGzAZBgNVBAoTE11vdXIg
Q29tcGFueSwgSW5jLjEhMB8GA1UEAxMYT1BJOTBEMDJCLnlvdXJkb21haW4uY29t
MIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEA0FVz7Ixlt4LgXdAR3znK
fX9f9bSBQooaIp4d7jK5kT67fix+0Pr5W0/XakYb4J2d+rTFnamu6B5XRXqqKXsA
z1D1pVZ/cVMTk2fhLTuzhxG0KDeouvTqRtq+AYcTeY0CNZ2nzOERxEvPU70zKHcD
krhjm2fvHvcCNWMiz9CBCKVR3AtjMg90MJd9BoNMebyR8cf6IoAcgGaZ5bth7zkf
myvFz3p+YGQfPxqMOzifZlenTV00nyirjbK5j1PuQ/wzZiacPEAKmbVJD+XMt9+d
YxvWVtW3Z9JBpnHiH0YJwiFUzYyttRS+VL9FR5HDj+HrXaWMQ91X1BMSqhDoIAK8
2wIDAOABoAAwDOYJKoZIhvcNAOEFBOADggEBAFuWVxEokMfPr8kThMO0usD0bGcR
TRikR/mG5nkJqhhnvfd/8slaCuMUcVBdw0fxWfQpyrHiiMP364DYoZkeweaa1nGc
viZyNhWQsGyM30G0H4OkNDXZQXi6X6GXvR0PwM/0aN7y94ki9mR2BOYmjNU9uPNZ
+xQ9kKERgsdmfZQpoEUq7rQ+gJiORU5rVzbn8XZtZ1xKzJUT3dReD16Yy9W7v66V
TcS+B7nhqnggNGfz5x7Fex0pyjtb3OJ2i5QMY4ODTYtIrURDEuK5/50qSTRVYweE
d/hZi9Hyz1DrEFkBd0VsUSKFsGPsrbDAK4JEHYoL1FxsNW3drBiGMApuKMk=
----END NEW CERTIFICATE REQUEST----
```

Most devices that employ the SSL/TLS protocols provide a method to accept appropriate input from the user and generate a CSR. HP LaserJet printers are no exception. Those that support the SSL/TLS protocols include a page on their Embedded Web Server (EWS) devoted to generating CSRs.



When the data is entered and the "Next" button is pressed, the printer proceeds to generate the CSR (which contains encoded versions of the information above and a "public" key). A "private key" is also generated at this time and stored away in a safe place on the user's computer.



At this point the CRS can be saved as a file or copied directly into the online form provided by a CA. This is the best (and easiest) method to use if the printer can generate a CSR for a 2048 bit certificate. The next section will outline procedures to use when the printer can only generate a CSR for a 1024 bit certificate.

# HP LaserJet Pro devices that support generating a 2048 bit certificate request

NOTE: If your device is listed below, skip the next section "When the printer cannot generate a Certificate Request for 2048 bit certificates" and go to "Installing the New Certificate" to install the certificate received from the Certificate Authority.

- HP Laser Jet Pro 200 color Printer M251n (firmware date code 20140521 or later required)
- HP Laser Jet Pro 200 color Printer M251nw (firmware date code 20140521 or later required)
- HP Laser Jet Pro 200 color MFP M276n (firmware date code 20140521 or later required)
- HP Laser Jet Pro 200 color MFP M276nw (firmware date code 20140521 or later required)
- HP Laser Jet Pro M401a (firmware date code 20140521 or later required)
- HP LaserJet Pro M401d (firmware date code 20140521 or later required)
- HP LaserJet Pro M401dn (firmware date code 20140521 or later required)

- HP LaserJet Pro M401dne (firmware date code 20140521 or later required)
- HP LaserJet Pro M401dw (firmware date code 20140521 or later required)
- HP LaserJet Pro M401n (firmware date code 20140521 or later required)
- HP Laser Jet Pro M425dn (firmware date code 20140521 or later required)
- HP LaserJet Pro M425dw (firmware date code 20140521 or later required)
- HP LaserJet Pro M435nw MFP
- HP Color LaserJet Pro MFP M476dn
- HP Color LaserJet Pro MFP M476dw
- HP Color LaserJet Pro MFP M476nw
- HP LaserJet Pro 500 color MFP M570dn
- HP LaserJet Pro 500 color MFP M570dw
- HP LaserJet Pro M521dn MFP
- HP LaserJet Pro M521dw MFP
- HP LaserJet Pro M701a Printer
- HP LaserJet Pro M701n Printer
- HP LaserJet Pro M706n Printer

# When the printer cannot generate a Certificate Request for 2048 bit certificates

Some HP LaserJet printers were designed before 2048 bit Certificates were declared the new standard. Many of these will have a firmware update that provides the ability to generate 2048 bit CSR. So, it's always a good idea to install the latest firmware (which can be obtained on HP.com) before resorting to the following procedures. However, some printers will never have this capability. The following procedures can be used for these.

<u>Warning</u>: Do not be tempted to obtain a certificate from a CA that includes the private key along with it (either in separate files or combined in a .PFX or .P12 file). The private key is to be kept private. It is never to be shared with anyone else. Doing so will circumvent any security that the certificate is intended to provide.

#### Method 1 - Software supplied by the CA

Some CAs supply free software that can be used to generate a CSR outside the printer. Once the CSR is generated, it can be submitted to any CA (not just the one that provided the software). One such program is **DigiCert's Certificate Utility**:

🚺 DigiCert Cert	ificate Utility for Windows©			Anna	
🖸 dig	icert <sup>®</sup> CERTIFICAT	E UTILITY fo	r Windows®	<b>\$ 1.800</b> support@dig	<b>).896.7973</b> gicert.com Live Chat
	SSL Certificates			Create CSR	▲ Import C Refresh
	Issued To	Expire Date	Serial Number	Friendly Name	Issuer
SSL	EXAMPLE.americas.hpqcorp.net	08-APR-2015	72EBC482000000691	FDF	
Code Signing					
X					
Tools					
Account			E	Export Certificate Test Key	View Certificate
Version 2.3.6					Close

The user friendly interface provides most of the functions needed to manage certificates. To generate a CSR, choose the "Create CSR" option:

🚺 DigiCert Certi	ificate Utility for Windows©		the same		
<b>G</b> dig	icert <sup>®</sup> CERTIFICAT	E UTILITY for	₩indows®	<b>\$ 1.80</b> ( support@dig	<b>).896.7973</b> gicert.com Live Chat
	SSL Certificates			Create CSR	1 mport C Refresh
	Issued To	Expire Date	Serial Number	Friendly Name	Issuer
SSL	EXAMPLE.americas.hpqcorp.net	08-APR-2015	72EBC482000000691FDF		
Code Signing					
Tools					
Account			Export	Certificate Test Key	View Certificate
Version 2.3.6					Close

The following form will be presented:

🖸 DigiCert Certific	ate Utility for Windows©	×
Create C	SR	
Certificate Det	ails SSL   Code Signing	Information Certificate Type (required)
Common Name: Subject Alternative Names:		Choose how you are going to use the certificate. If you choose SSL, then the certificate will be saved in the machine certificate store. If you choose Code Signing, then the certificate will be saved in your own certificate store.
Organization: Department:		
City:		
State:		•
Country:		•
Key Size:	2048 (more secure)	•
	Generate Cancel	

Detailed help for each topic is provided on the right hand side of the window.

For a printer, choose the "SSL" certificate type and "2048" for the "Key Size". The "Common Name" is the name that will be used to access the printer. Most often, this will be the Fully Qualified Domain Name (FQDN). This is a combination of the Host Name followed by the Domain Name. In the following example, the FQDN would be: "NPI90D02B.americas.hpqcorp.net"

HP LaserJet 400 M401dn 16.88.181.170 - Mi	crosoft Internet Explorer provided by He	ewlett-Packard	# 3**	
<u><u> </u></u>				
X McAfee -			x	🍕 Convert 🔻 🛃 Select
😋 🔵 🗢 🙋 http://npi90d02b.americas.hp	oqcorp.net/set_config_IP.html?tab=Netw	vorking&menu=Nt 🔻 🍫 🗙	🔧 Google	+ م
🚖 Favorites 🛛 👍 🔊 Timecard 🔅 Emai	il Services mail2web 🦻 MLabs SSL VPN	N 🔏 Suggested Sites 👻 🙋 @h	ip Employee Portal 🖉 Wi	eb Slice Gallery 🔻
A HP LaserJet 400 M401dn 16.88.181.170		🏠 🕶 🔝 👻 🖃 🖶 💌 <u>P</u> a	ge ▼ <u>S</u> afety ▼ T <u>o</u> ols ▼	0 - 😣 🐟 🔉 💷 🔊
🍈 HP LaserJet 400 N	M401dn			
HP LaserJet 400 M401dn NPI90D02B 16.8	38.181.170			
Home System	Print Network	ting HP Web Services	HP Smart Install	
Network Summary Configuration	IPv4 Configuration		Shop for Supplie:	s Support
IPv4 Configuration				
IPv6 Configuration	IPv4 Warning: Cha device	inges to these settings may res	ult in loss of connectivity	with the
Network Identification	Enabled device.			
Advanced				
Settings	Host Name	NPI90D02B	Set by: Default	
Certificates	Domain Name:	americas.hpqcorp.net	Set by: DHCP	)
HTTPS Enforcement				
SNMP	IP Configured By:	DHCP		
Access Control List	IP Preferred Address Method:			
802.1X Authentication	ID Addresses	46.00.404.470	_	
Firewall	IP Address:	10.88.181.170		
	Subnet Mask:	255.255.252.0	~	
	Default Gateway:	16.88.180.1		
			Apply	Cancel
L				
				-
		🗸 Trusted sites   Pro	tected Mode: Off	🖓 🔻 🍳 115% 🔻 💡

Less often, printers are accessed using just the Host Name (e.g.: "NPI90D02B"). And, sometimes printers are accessed using the IP address (16.88.181.170 in this example). The most important factor in setting the Common Name is to make sure that it doesn't change. If the Common Name changes, then the certificate will no longer be valid. A new certificate will need to be obtained. So, if the printer is configured by DHCP, then it's probably not a good idea to use the IP address (since it will change periodically).

Part of value of a certificate is having a trustworthy and well respected agency (the CA) vouch for your device (the printer). They "certify" that the printer belongs to you and that you are a real company/person and not just someone spoofing a printer for illicit purposes (i.e. to obtain confidential information, etc.). So, providing accurate information is vital to the process of obtaining a certificate. The best CAs will verify all of it before issuing a certificate.

Once the correct information is entered, the "Generate" button is pressed and a CSR is created. This is the CSR:

S DigiCert Certificate Utility for Windows© - Create CSR	x
The certificate request has been successfully created.	
BEGIN NEW CERTIFICATE REQUEST MIICkDCCAXgCAQAwSzELMAkGA1UEBhMCVVMxDjAMBgNVBAgTBUlkYWhvMQ4wDAYD VQQHEwVCb2lzZTELMAkGA1UEChMCSFAxDzANBgNVBAMTBmhwLmNvbTCCASIwDQYJ KoZIhvcNAQEBBQADggEPADCCAQoCggEBAMHQjAmSOeYKZXMKgpa5zxlkKyAGQdVZ mm60ykprU6JWAyh2AF0qenOtJ47Kh7liT+zxleTupESOFzJ+kKWMxHGVIB5uGupt y+ies6szD5Pzoyud2ASQTmL3QxcyqKew8jEdD6ON5W5HkQs7GIKC6pg4DUDrhOxb GwOpYbXECXvYJ6hKs/jyBW/MNPWx5MI4juXBJ/Z00hXwjbfQ4yXuCYg5ijHx5FN aWtjnrTi+xi5Y/ZcypcT7XlbsILoZojUj2S16bbzrKXZbkbNgoxj+VzGKjyxI778 yDZECrP6IReKtahF2yvw+eIRafltnioauO4bknc05UZLdp+bNbXj4pECAwEAAAA MA0GCSqGSIb3DQEBBQUAA4IBAQCIqKp/PbR6/RwdpgK9kwcteHbK4t+09Vz7Vwj3 0CyCmY+09f7SjiP7pMB0V+1TIKSuDT7FlpUcsoobN1lcOvX9mqtNsynoGTBC701k pagpVrDV3gFoJAg+3tnwh950XSkIR4FmPItj1YSdgT9yBgjqQkSeyt/Khxai63Mm snoaVIzYyEt1PN5JS2pZ01rEPKrjWuJA8b4dS/ONwqZ/ttfMt8UMZgIenwdPu44 WX10e4EPaOGjU+wZpMoU0MjAFNx+tNiJHbGMJffFnQP2pZqb0+/HOXw118kbFUFX 9QKXhMnqwt3nF8/DBtMCHCK1k3S/yU3+SKXupQ+qPEckLtUf END NEW CERTIFICATE REQUEST	
Copy CSR Save to File Close	

The utility also stores away the private key for future reference (it will be needed after the certificate is issued). If you use this method, be sure that the program has a valid code signature and is from a reputable source. This can be done by examining the "Digital Signatures" tab of the "Properties" dialog (accessed by right-clicking the file name and selecting "Properties").

Security         Details         Previous version           General         Compatibility         Digital Signatu           Signature list         Image: Security of Signer:         E-mail address:         Timestamp           DigiCert, Inc.         Not available         Thursday, June 20, 2           Details         Details	Convitu	Deteile	Denvious Marriana
General         Compatibility         Digital Signatu           Signature list         Image: Signature list         Timestamp           DigiCert, Inc.         Not available         Thursday, June 20, 2           Details         Details	Securty	Details	Previous Versions
ignature list          Name of signer:       E-mail address:       Timestamp         DigiCert, Inc.       Not available       Thursday, June 20, 2         Details       Details	General	Compatibility	Digital Signatures
Name of signer:       E-mail address:       Timestamp         DigiCert, Inc.       Not available       Thursday, June 20, 2         Details       Details	gnature list		
DigiCert, Inc. Not available Thursday, June 20, 2 Details	Name of signer:	E-mail address:	Timestamp
Details	DigiCert, Inc.	Not available	Thursday, June 20, 2
			Details

Here are some other examples of software that can be used to generate a 2048 bit CSR

- http://www.trustico.com/ssltools/create/csr-pem/create-a-new-csr-instantly.php
- http://www.gogetssl.com/online-csr-generator/
- https://certificatesssl.com/ssl-tools/csr-generator.html

### Method 2 – OpenSSL

The OpenSSL Project is a collaborative effort to develop a robust, commercial-grade, full-featured, and Open Source toolkit implementing the Secure Sockets Layer (SSL v2/v3) and Transport Layer Security (TLS v1) protocols as well as a full-strength general purpose cryptography library. The project is managed by a worldwide community of volunteers that use the Internet to communicate, plan, and develop the OpenSSL toolkit and its related documentation.

A Windows based version of the OpenSSL toolkit can be obtained through the link on this page: http://www.openssl.org/related/binaries.html

- 1. Download and install the appropriate Visual C++ 2008 Redistributables (x32 or x64 depending on your system)
- 2. Download and install the appropriate version of OpenSSL (x32 or x64 depending on your system).
- 3. Copy openssl.cfg from C:\OpenSSL-Win64\bin (or C:\OpenSSL-Win32\bin) to C:\usr\local\ssl and rename it to openssl.cnf

This is a command line utility (run from the Command Prompt) which will generate a CSR. It needs to be executed from the same directory that it is installed in.



It can be complicated and confusing to try and figure out all the details of the command line for OpenSSL. So, DigiCert has created the **"OpenSSL CSR Wizard"** which will generate the proper command line from the input provided:

## **OpenSSL CSR Creation**

OpenSSL CSR Wizard The fastest way to create your CSR for Apache (or any platform using OpenSSL)

Fill in the details, click Generate, then paste your customized OpenSSL CSR command into your terminal.

Common Name:	NPI90D02B.yourdomain.com	Now just copy and paste this command into a
Organization:	Your Company, Inc.	terminal session on your server. Your CSR will
Department:	Sales	be written to NPI90D02B_yourdomain_com.csr
City:	Your City	openssi reg -new -newkey rsa:2048 -
State:	Your State	NPI90D028_yourdomain_com.csr -
Country:	USA	NPI90D02B_yourdomain_com.key -
Key Size:	2048 (recommended)	Inc./OU=Sales/CN=NPI90D028.yourdom
	Generate	

The command shows up in the box on the right. It can be copied and pasted into the command line. In this example, the CSR will be put into a file named: NPI90D02B\_yourdomain\_com.csr. The private key will be put into a file named: NPI90D02B\_yourdomain\_com.key.

# **Obtaining a certificate from the CA**

This step of the process the same no matter how the CSR is generated. All of the top CAs will have a page on their web site which facilitates submission. Here is an example:



Here is another example:



In both cases, the CSR is copied directly to the text box provided on the page. Assuming everything goes well, the certificate will be provided by email or available for download. It will be a text file with encrypted data that the printer will use once the certificate is installed. It can take one of these three formats:

- 1. Cryptographic Message Syntax Standard ((.P7B, .P7R or .SPC) The PKCS #7 format supports storage of certificates and all certificates in the certification path.
- DER-encoded binary X.509 (.DER, .CER, or .CRT) The Distinguished Encoding Rules (DER) format supports storage of a single certificate. This format does not support storage of the private key or certification path.
- Base64-encoded X.509 (.CER or .CRT) The Base64 format supports storage of a single certificate. This format does not support storage of the private key or certification path.

Here's a typical example:

----BEGIN CERTIFICATE----MIIGoTCCBYmgAwIBAgIQQJjbe4McCet2VULWFkhhfzANBgkqhkiG9w0BAQUFADCB njEPMA0GA1UEChMGaHAuY29tMRowGAYDVQQLExFJVCBJbmZyYXN0cnVjdHVyZTEL MAkGA1UEBhMCVVMxIDAeBgNVBAoTF0hld2xldHQtUGFja2FyZCBDb21wYW55MUAw PgYDVQQDEzdIZXdsZXR0LVBhY2thcmQgUHJpdmF0ZSBDbGFzcyAyIEN1cnRpZmlj YXRpb24gQXV0aG9yaXR5MB4XDTEzMDcyNTAwMDAwMFoXDTE0MDcyNTIzNTk10Vow XTEqMB4GA1UEChQXSGV3bGV0dC1QYWNrYXJkIENvbXBhbnkxEDAOBqNVBAsUB1N1 cnZlcnMxJzAlBgNVBAMTHm5waTkwZDAyYi5hbWVypqrhcy5ocHFjb3JwLm5ldDCC ASIwDQYJKoZIhvcNAQEBBQADqqEPADCCAQoCqqEBAMUjta12DD3/XwX99u5a3at5 /zEwFwUcV6d3WBvwCtGZ9Ab+cOmuQC/JtFi6nP54rv/YPACsvbGUyWMbY1VduNA5 msCplfgDE4nNKgUdpr4gxrHPmHfB3YUQiApreY2RgLsaFzKUwYttyl/SMDgVb4tu cDv4OvoODB/PHysodWNpEm+/iXPNZejmz0y41+EZE0VbHWWyvnsXmc2UMSGwiEfp qPPwLqrEBOejllmgc92ICkzpA4FT1Ks4tMdUXVRQRa+Q8RgWLqYAqFBADTsOITXq VnItqoE3foQ6No+21GkuawfRC9bn7IVqkftXos8uq3NCsX5B4rB5yNj0RZbbJIcC AwEAAaOCAxkwggMVMAwGA1UdEwEB/wQCMAAwDgYDVR0PAQH/BAQDAgSwMB8GA1Ud IwQYMBaAFDft9xV5LTClmJp1tlw344jqEWrVMB0GA1UdDgQWBBSXYOHy7seF/U3C /651zKF+QnsTKjCCAR4GA1UdHwSCARUwqgERMIIBDaCCAQmqqqEFhkdodHRwOi8v b25zaXR1Y3JsLnZ1cm1zaWduLmNvbS9IZXdsZXR0UGFja2FyZENvbXBhbn1IUE1U RzIvTGF0ZXN0Q1JMLmNybIaBuWxkYXA6Ly9sZGFwLmhwLmNvbS9DTj1IZXdsZXR0 LVBhY2thcmolMjBocml2YXRlJTIw02xhc3MlMjAyJTIw02VydGlmaWNhdGlvbiUy MEF1dGhvcml0eSxPPUh1d2x1dHQtUGFja2FyZCUyMENvbXBhbnksQz1VUyxPVT1J VCUyME1uZnJhc3RydWN0dXJ1LE89aHAuY29tP2N1cnRpZm1jYXR1cmV2b2NhdG1v bmxpc3Q7Ym1uYXJ5MCoGA1UdJQEB/wQgMB4GCCsGAQUFBwMBBggrBgEFBQcDAgYI KwYBBQUHAwQwewYDVR0qBHQwcjBwBqorBqEEAQsEAwUBMGIwKQYIKwYBBQUHAqEW HWh0dHA6Ly9kaWdpdGFsYmFkZ2UuaHAuY29tL2NwMDUGCCsGAQUFBwICMCkaJ1Ro aXMgYXV0aG9yaXR5IG1zIGZvciBIUCBidXNpbmVzcyBvbmx5LjCB6QYIKwYBBQUH AQEEqdwwqdkwJqYIKwejbQUHMAGGGmh0dHA6Ly9ocC1vY3NwLnN5bWF1dGquY29t MIGuBggrBgEFBQcwAqSBoTCBnjEPMA0GA1UEChMGaHAuY29tMRowGAYDVQQLExFJ VCBJbmZyYXN0cnVjdHVyZTELMAkGA1UEBhMCVVMxIDAeBqNVBAoTF0hld2xldHQt UGFja2FyZCBDb21wYW55MUAwPgYDVQQDEzdIZXdsZXR0LVBhY2thcmQgUHJpdmF0 ZSBDbGFzcyAyIEN1cnRpZmljYXRpb24gQXV0aG9yaXR5MA0GCSqGSIb3DQEBBQUA A4IBAQAoaGax0H/nI1hmoGcEkkHiJWb7YXCX8A4mY1mHhC/1rcRA/BSnNoipLkE1 T/CImdzqb03CC5BcMOu3Poc9SpU6eQF65dHTM+WDHWZf1SVX4kHWuAmT698eX8De Pt+y+SB9gZqWff+lEu55JkxkjU5JfXN3MhyzaIN1Ft8051WCx6qyJkIs1yKWrNYX CdLU8sU/p+PG6F8hugeZr5e0QBgqHDiIraMZBlzDFcTH0kwvObjPIBNLqsF1ek20 fAj5Ifxdo1rbO6a/vkIjVZpE4p7K/VHZM6F+kKMaO22qx9d40ixFN2XQQnFDwMZo kKKuuVfC0XwUbYMkt59kp6Pnk+UU ----END CERTIFICATE-----

## **Installing the Certificate into the Printer**

When a CSR is generated by the printer, an option to "Install a Certificate" will appear in the list:



This option will not appear if the CSR was generated by one of the alternate methods. If it is visible (from a previous attempt to generate a CSR), then it will only work with the certificate which resulted from the most recent printer-generated CSR. It will not work with certificates generated by one of these alternate methods. Instead, the certificate must be converted to the "Personal Information Exchange" format (PKCS #12, .PFX, or .P12) and installed using the "Import a Certificate and Private Key" option.

# Converting the Certificate to the Personal Information Exchange (.PFX) format

If a certificate was obtained using a CSR which was not generated by the printer, then it cannot be installed directly into the printer. It must first be converted to the PKCS #12, .PFX, or .P12 format. Then the "Import" option can be used to transfer the certificate and private key to the printer. Most certificate management programs can provide this function. DigiCert's Certificate Utility is shown here for example purposes.

### Method 1 – Software supplied by the CA

The first step is to select the "Import" option on the main window of the Certificate Utility:

🖸 DigiCert Certificate Utility for Windows®					
🖸 dig	icert <sup>®</sup> CERTIFICAT	E UTILITY fo	r Windows®	<b>\$ 1.80</b> support@	0.896.7973
	SSL Certificates			Create CS	Import Refresh
	Issued To	Expire Date	Serial Number	Friendly Name	Issuel
SSL	EXAMPLE.americas.hpqcorp.net	08-APR-2015	72EBC482000000691FDF		
Code Signing					
Tools					
Account			Firmed	Carliforda Tast V	View Cartification
			Export		view certificate
Version 2.3.6					Close

Next, provide the name of the file that contains the certificate:

DigiCert Certificate Utility for Windows®
Certificate Import
This wizard will assist you with importing a certificate. Depending on the type of file you are importing you may be prompted for a password to decrypt the private key.
File Name         eed\Pictures\security certificates\WPI90D028_americas_hpqcorp_net.crt         Browse
< <u>B</u> ack <u>N</u> ext > Cancel

Select the "Finish" button when ready to import the certificate:

DigiCert Certificate Utility for Windows©
Certificate Import
The following certificate is ready to be imported. For more details of the certificate press the View Certificate button. View Certificate Name: npi90d02b.americas.hpqcorp.net Serial Number: 4098DB7B831C09EB765542D61648617F Thumbprint: 35C546663CA3DCC7A1919DD0A55B043745A3664B Private Key: Search for an existing private key match on the computer
Press the Finish button to import the certificate and search for a matching private key.
< <u>B</u> ack Finish Cancel

The main screen of the utility will now include the new certificate:

🚺 DigiCert Cert	ificate Utility for Windows©		and the second		
🖸 dig	icert <sup>®</sup> CERTIFICA	TE UTILITY fo	r Windows®	<b>\$ 1.80</b> support@di	<b>0.896.7973</b> gicert.com Live Chat
	SSL Certificates			Create CSR	▲ Import C Refresh
	Issued To	Expire Date	Serial Number	Friendly Name	Issuer
SSL	EXAMPLE.americas.hpqcorp.net	08-APR-2015	72EBC482000000691FDF		
	npi90d02b.americas.hpqcorp.net	25-JUL-2014	4098DB7B831C09EB7655		Hewlett-Pac Company
Code Signing					
×					
Tools					
Account			Export	Certificate Test Key	View Certificate
Version 2.3.6					Close

Next, select the "Export Certificate" button on the main window of the Certificate Utility:

S DigiCert Certificate Utility for Windows					
🖸 dig	icert <sup>®</sup> CERTIFICAT	E UTILITY for	r Windows®	<b>\$ 1.800</b> support@dig	<b>).896.7973</b> gicert.com Live Chat
	SSL Certificates			Create CSR	▲ Import C Refresh
	Issued To	Expire Date	Serial Number	Friendly Name	Issuer
122	EXAMPLE.americas.hpqcorp.net	08-APR-2015	72EBC482000000691FDF		
350	npi90d02b.americas.hpqcorp.net	25-JUL-2014	4098DB7B831C09EB7655		Hewlett-Pac Company
<b>S</b>					
Code Signing					
×					
Tools					
Account					
			Export C	ertificate Test Key	View Certificate
Version 2.3.6					Close

and choose "pfx file" option as shown here:

DigiCert Certificate Utility for Windows©			
Certificate Export			
<ul> <li>This wizard will export a certificate and optionally its private key from the certificate store to disk.</li> <li>You must select the private key option if you wish to install this certificate on a different computer.</li> <li>Do you want to export the private key with this</li> <li> <b>()</b> Yes, export the private key  </li> <li> <b>()</b> pfx file  </li> <li> <b>()</b> Include all certificates in the certification path if possible</li></ul>			
$\bigcirc$ No, do not export the private key			
< <u>B</u> ack <u>N</u> ext > Cancel			

The PFX format is required by the LaserJet printer. It contains everything needed to protect the printer from unauthorized access:

- Certificate
- Public key
- Private key

These are also the three vital components that a hacker needs to circumvent the printer security. So, treat this file with great care. Always store it in a safe and secure location. A password is required to help prevent unauthorized access. Do not share this password with anyone.

DigiCert Certificate Utility for Windows©	x			
Certificate Export				
In order to protect the sensitive information in the private key, you are required to enter a password.				
Password				
Confirm Password				
•••••				
< <u>B</u> ack <u>N</u> ext >	Cancel			

Provide a name and location for the .PFX file:

🚺 Digi	Cert Certificate Utility for Windows©	x
Се	ertificate Export	
Ente	er the file name that you want to save the exported certificate to press Finish to export the certificate.	
Ente	r a file name for the exported	
F	ile name	
	's \benneed \Documents \Download \npi90d02b_americas_hpqcorp_net.pfx	
	< <u>B</u> ack Finish Can	ncel

Here are some examples of other software than can be used to create the PFX file:

### http://www.trustico.com/ssltools/convert/pem-to-pkcs12/convert-pem-to-pkcs12.php

#### https://certificatesssl.com/ssl-tools/convert-certificate.html

#### Method 2 - OpenSSL

OpenSSL can also be used to create the PFX file that can be imported into the printer. Use the following command:

openssl pkcs12 -export -in <cert-file-name.ext> -inkey <key-file-name.ext> -out <export-file-name>.pfx

Substitute the items contained in "<...>" with the appropriate file names for the certificate, the private key, and the output PFX file. This command will prompt for a password to protect the private key (just like the DigiCert utility). This password will be required when importing the certificate into the printer. Here's an example of how it works:



### Installing the new certificate

The certificate is now in a format that can be accepted by the printer. From the "Printer Certificate Options" page on the printer EWS, choose the "Import a Certificate and Private Key" option and select "Next":



Provide the filename for the .PFX file and the password that was used when the file was originally created. Select "Finish".

AP LaserJet 400 M401dn 16.88.181.170	0 - Microsoft Internet Explorer provided b	y Hewlett-Packard	
File Edit View Favorites Tools	Help		
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🚖 Favorites 🛛 🦂 🔊 Timecard 🄅	Email Services mail2web 🙋 MLabs SSL	VPN 🔏 Suggested Sites 🔻 🔊 @hp Employee Portal 🔊 V	Veb Slice Gallery 🔻
😬 👻 🏉 H 🗙 🌈 http: 🚺 DigiC	🚾 Ope 🏈 Digit	🝷 🔝 🝷 🖶 🝷 Page 👻 Safety 👻 Tools 👻 🔞 💌	8 🐟 🔊 🔳 🔊
HP LaserJet 400	M401dn		
HP LaserJet 400 M401dn NPI90D02B 16.8	8.181.170		
Home System	Print Networking	HP Web Services HP Smart Install	
Network Summary Configuration IPv4 Configuration	Certificates	Shop for Supplies	Support
IPv6 Configuration	Enter the name of the file that contains the	cartificate and private key. You must provide the password that w	as used
Advanced	to encrypt the private key.	continuate and private key. For must provide the password that we	13 0300
Security	The file format must be BKC S#12 encode	d ( nfv)	
Settings	The file format must be Fixe 3#12 encode	a (-pix).	
Certificates	File Name: *	C:\Users\benneed\Pictures\security certificates Br	owse
SNMD	Password: *	•••••	
Access Control List	Mark private key as exportable	Finish	
802.1X Authentication	* required field		
Firewall			
		Back	Cancel
		Trucked sites   Destanted Made: Off	
		V Trusted sites   Protected Mode: Off	• • 100% •

A HP LaserJet 400 M401dn 16.88.181.170 -	- Microsoft Internet Explorer provided I	by Hewlett-Packard				
File Edit View Favorites Tools H	Help					
🗙 🤣 McAfee' 🖉 🔻			🗴 🍖 Convert 🔻 🔂 Select			
🚱 🔾 💌 🔊 http://npi90d02b.americas.hpqcorp.net/hp/device/set_config_networkCertsSSF 👻 😽 🗙 🚼 certificate signing request						
🖕 Favorites 🛛 👍 🙋 Timecard 🄅 E	Email Services mail2web 🔊 MLabs SS	L VPN 🔏 Suggested Sites 👻 💋 @hp Employ	yee Portal 👩 Web Slice Gallery 🔻			
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MP LaserJet 400 M	/1401dn					
HP LaserJet 400 M401dn NPI90D02B 16.88.1	181.170					
Home System	Print Networking	HP Web Services HP Smart Install				
Network Summary Configuration IPv4 Configuration	Certificates	Shop fo	r Supplies Support			
IPv6 Configuration						
Network Identification		The printer certificate has been updated.				
Security		ОК				
Settings						
Certificates						
HTTPS Enforcement						
SNMP						
Access Control List						
802.1X Authentication						
Firewall						
			-			
Done		✓ Trusted sites   Protected Mode: Off	A      A  A     A			

Select "OK" to return to the main Certificates screen. To verify that the new certificate has been installed, select the "View" button:



## **Applicable Products**

```
HP LaserJet Pro 200 color Printer M251n – CF146A
HP LaserJet Pro 200 color Printer M251nw – CF147A
HP TopShot LaserJet Pro M275 MFP – CF040A
HP LaserJet Pro 200 color MFP M276n – CF144A
HP LaserJet Pro 200 color MFP M276nw – CF145A
HP LaserJet Pro 400 color Printer M451dn – CE957A
HP LaserJet Pro 400 color Printer M451dn – CE957A
HP LaserJet Pro 400 color Printer M451dn – CE957A
HP LaserJet Pro 400 color Printer M451dw – CE958A
HP LaserJet Pro 400 color Printer M451nw – CE956A
HP LaserJet Pro 300 color MFP M375nw –CE903A
HP LaserJet Pro 400 color MFP M475dn – CE863A
HP LaserJet Pro 400 color MFP M475dw – CE864A
HP LaserJet Pro 400 Printer M401a – CF270A
HP LaserJet Pro 400 Printer M401d – CF274A
HP LaserJet Pro 400 Printer M401dn – CF278A
HP LaserJet Pro 400 Printer M401dne – CF399A
HP LaserJet Pro 400 Printer M401dw – CF285A
```

### HP LaserJet Pro 400 Printer M401n – CZ195A HP LaserJet Pro 400 MFP M425dn – CF286A HP LaserJet Pro 400 MFP M425dw – CF288A

### For more information

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