DoubleClue Credential Provider for Windows

Content

1. Introduction

DoubleClue Credential Provider for Windows (henceforth referred to as DCCPW) is a software package introduced with DoubleClue Enterprise Management (DCEM) v2.3.1, which enables DoubleClue to be integrated into Windows' native Logon UI process. Users are prompted to authenticate themselves with one of DoubleClue's many multi-factor authentication (MFA) methods in order to be able to log into their Windows machines. This adds an extra layer of security to Windows authentication, which is centrally configurable from DCEM via its Auth-Connector and Policy functions.

Requirements:

- Windows 10 64-bit (if you want to use a 32-bit version, contact support@doubleclue.com)
- Connection to a running DCEM server (v2.3.1 or later)

2. Installation

DCCPW is installed with an MSI package made from the DCCPW distributables. Please contact support@doubleclue.com and we will send you the necessary zip-file.

In order for DCCPW to connect to a DCEM server, it requires two files:

- AuthConnector.dcem
- SdkConfig.dcem

These files contain information that DCCPW needs to establish a connection with DCEM and provide keys for DCCPW to identify itself. You can find more information in **DCEM Manual**, chapters **3.4.2.2** and **8.9**, on how to obtain these files from DCEM.

Before you create the MSI package, we further advise to change the **config.json** file which you can find among the distributables. In this file, you find a list of all credential providers natively found on a Windows operating system and enable or disable them according to your preferences. For security reasons, we recommend to disable all of them except for the DoubleClue Credential Provider.

If you want to use Confidential Network Server (CNS) you also need to add the **cnsCertificate.pem** and do some further changes to the config.json. For more information about CNS, see chapter 3.3 Confidential Network Server.

⚠ It is not possible to change the config.json after you have created the MSI packet. Ensure that all necessary changes have been implemented, before you run the **make_msi.bat**.

In order to create a new MSI package, please do the following:

1. Download and install **WiX Toolset** – WiX is an open source software published under the Microsoft Reciprocal License. You can download it from the developer's homepage at https://wixtoolset.org/releases/ tested with Version 3.11.
2. Extract **DC_CredentialProvider.zip**

3. Copy **AuthConnector.dcem**, **SdkConfig.dcem.** If you want to use CNS, also copy the **cnsCertificate.pem** into the folder called **configs** and modify the **config.json** as described in chapter 3.3 Confidential Network Server.
4. You may want to alter **ls_icon.png** in this folder as well. This image will be seen by users above their credentials in the Windows Logon UI. Make sure that your new image has the exact same name.
5. Run **make_msi.bat** as an admin.

The MSI package should be created after a few seconds. Installing DCCPW is now as easy as running this file as an admin on the host Windows machine. The same MSI can be later used for uninstalling or repairing DCCPW.

Per default, you can find the installed files under **C:\Program Files\DoubleClue Credential Provider.** If you have chosen a custom directory during the installation, look for the folder "**DoubleClue Credential Provider**" in this directory. You will find that AuthConnector.dcem, SdkConfig.dcem, cnsCertificate.pem and ls_icon.png are copied here. If you need to update these files in the future, simply change them in this folder.

3. Features

3.1 Supported Users

DCCPW supports both Local Users (i.e. users created locally on a Windows machine) and Domain Users (eg. from Active Directory).

Once installed, DCCPW will completely replace the default Windows Credential Provider. Users can only log into their Windows machines after they successfully identify themselves with one of the available MFA methods provided by DoubleClue.

⚠ In order to avoid locking out a Windows machine in case something goes wrong, **Local Users who are also Administrators** are given the privilege of completely skipping DoubleClue MFA.

Windows will ALWAYS perform its own native authentication behind the scenes, meaning that user credentials must be perfectly synchronised between DCEM and Windows in order to work.

This can be a problem when a Domain User's domain is identified by a different name in DCEM than in Windows. Ensure that domain names in DCEM are the same as those used for the Windows logins.

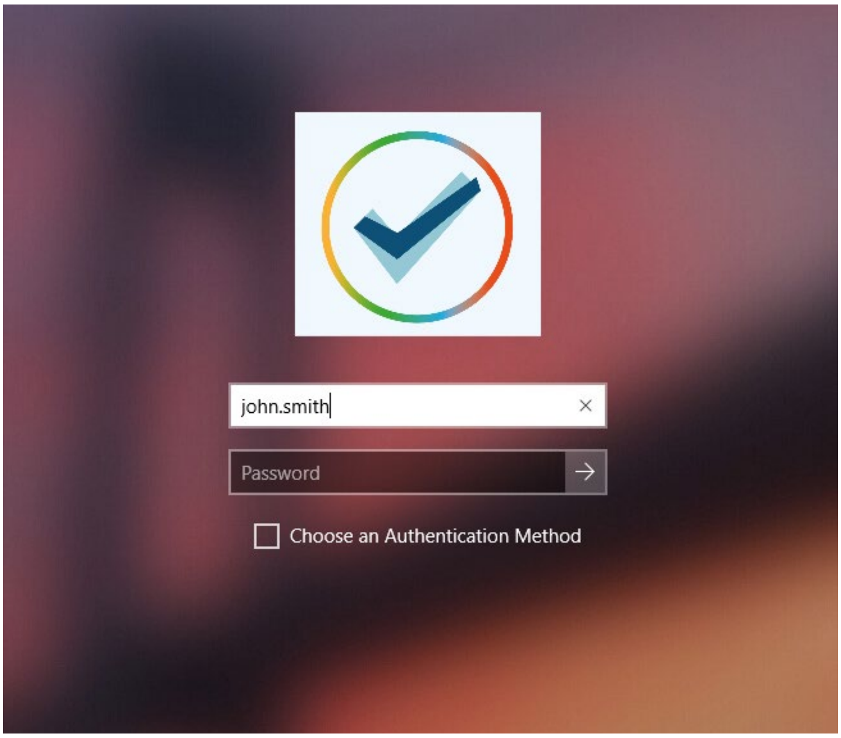
In case that a Local User exists in DCEM but not in Windows, DCCPW will automatically create that user on the fly using the credentials from DCEM (once the user successfully identifies themselves with a MFA method). If the local user exists but has a different password in Windows, this password is automatically updated to match the one in DoubleClue.

After initializing the login process by entering his unsername and password, the user has 2 minutes to complete the authentication process with MFA. This period is set by Windows cannot be changed. Should the user not be able to complete the MFA process within those two minutes, the authentication will fail. The user has to start the process anew by once more entering their username and password.

3.2 Supported Scenarios

DCCPW supports the following scenarios in Windows:

- Login
- Unlock
- Remote Login (partial)
- Change Password
- Password Expired
- User Account Control



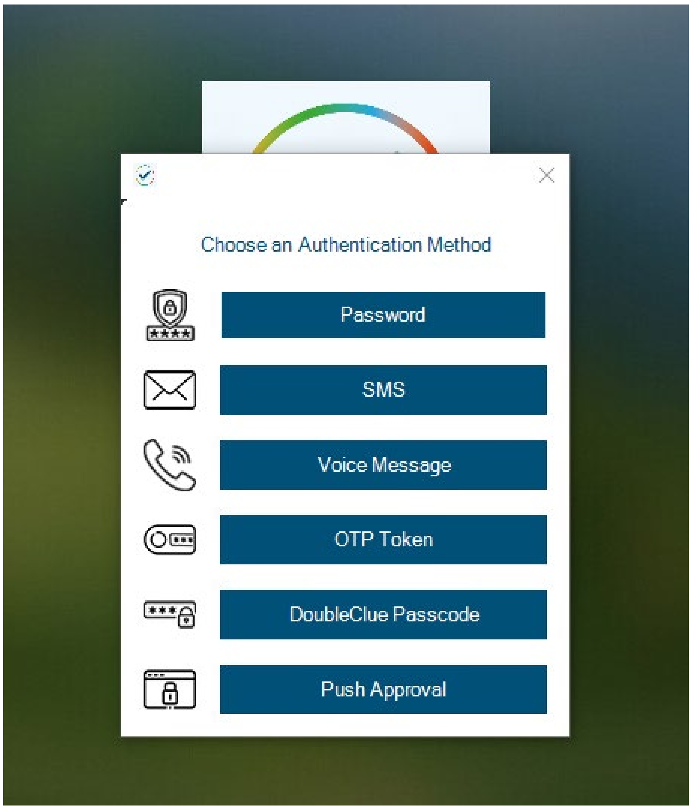
3.2.1 Login

The most common use for DCCPW is the Login scenario. Right after switching on their machines, users will be presented with a familiar screen demanding a username and a password.

The credentials here can be supplied just as if it was a normal Windows login. Domains can be identified either by “*domain*\username” or “*username@domain*”. Setting the domain as “.”, the Machine Name or omitting it entirely indicates that the user is local.

After submitting the credentials, DCEM will handle the necessary verifications. If correct, DCCPW will present the user with a list of Authentication Methods as approved by DCEM's policies. You can further define a default authentication method, which will be standardly used when a user logs in. If a user wants to use a different than the default MFA method, they can check the "Choose an Authentication Method" box and will be forwarded to the list to choose the authentication method. Please look at DCEM Manual chapter 7.2 for more information about DoubleClue policies.

⚠ Currently, we do not support QR Code or FIDO logins in DCCPW, therefore they will not appear even if enabled in the policies. Don't set QR Code or FIDO as the default authentication method for DCCPW.



For more information on each individual Authentication Method, please look at DCEM Manual chapter 7.1.

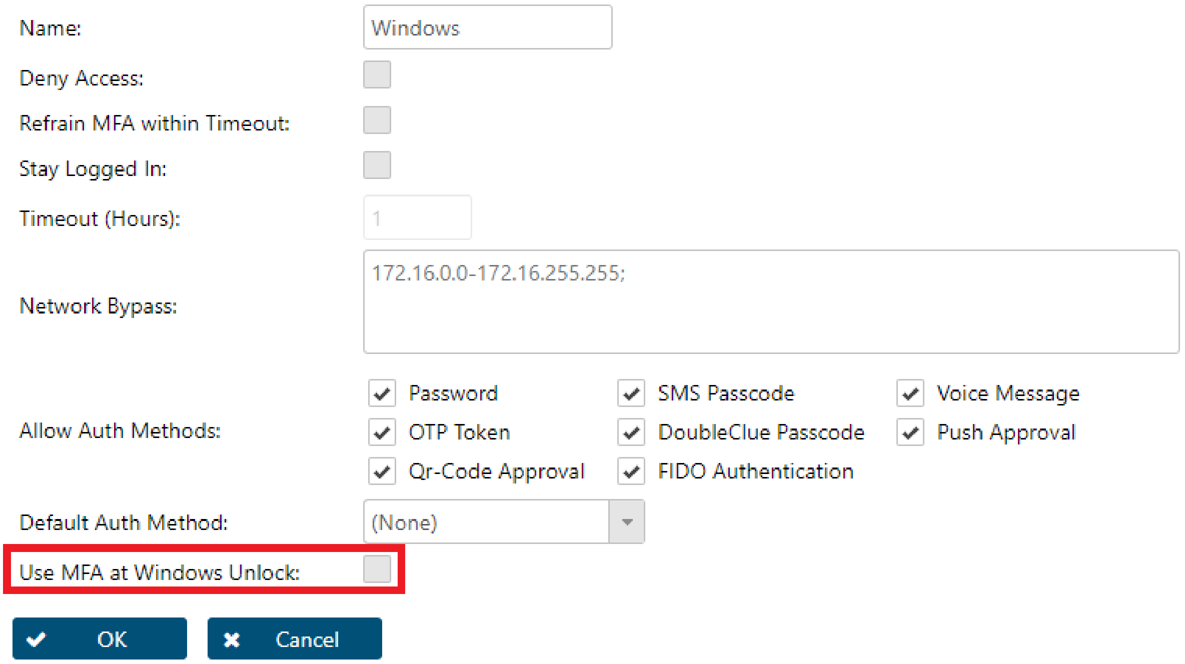
Once an Authentication Method is completed successfully, the user gains access to Windows.

3.2.2 Unlock

Unlock is almost identical to Login, except that it refers to logging into an account which had already been logged into before and is still active.

To facilitate Unlocking, DCCPW checks the last logged in user and automatically fills in the username with this information (NOTE: this information is readily available in Windows and is not stored to or read from an external source).

Furthermore, DCEM includes a special setting in its policies, which allows for skipping MFA should the user be performing an Unlock in Windows.



Name:	Windows
Deny Access:	□
Refrain MFA within Timeout:	□
Stay Logged In:	□
Timeout (Hours):	1
Network Bypass:	172.16.0.0-172.16.255.255;
Allow Auth Methods:	☑ Password ☑ SMS Passcode ☑ Voice Message ☑ OTP Token ☑ DoubleClue Passcode ☑ Push Approval ☑ Qr-Code Approval ☑ FIDO Authentication
Default Auth Method:	(None)
Use MFA at Windows Unlock:	□

3.2.3 Remote Login

DCCPW supports logging into Windows using RDP (Remote Desktop), however due to limitations in Windows, this is a two-part process.

First, the user needs to supply RDP with the correct credentials. Once verified and connected to Windows, the user needs to supply the **SAME credentials again** to DCCPW and undergo the MFA process.

The Windows login using Remote Desktop is at this point only implemented for Domain Users. It isn’t available for Local Users.

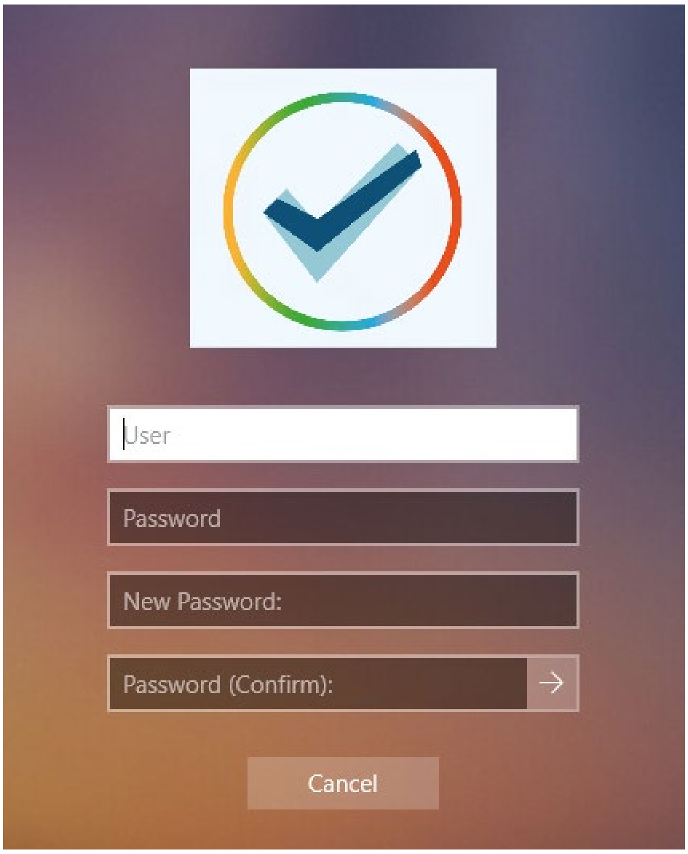
3.2.4 Change Password

A user may want to change their password for security reasons. This can be done with DCCPW, which is automatically triggered when the user opens this Windows function (eg. by pressing Ctrl+Alt+Del then choosing ‘Change Password’ from the menu). Change password will **always** ask for an MFA method.

Changing a password with DCCPW **will also change the password in DCEM**, meaning that all connected services will now use this new password.

⚠ Changing a password in DCEM as a Local User **does NOT change the Windows password**, causing the two to be desynchronised. If such a desynchronization happens, please re-synchronize by changing the password in DCEM back to the old password and then change it from Windows via DCCPW instead.

This does not affect Domain Users, whose credentials to both, Windows and DCEM, are maintained externally.



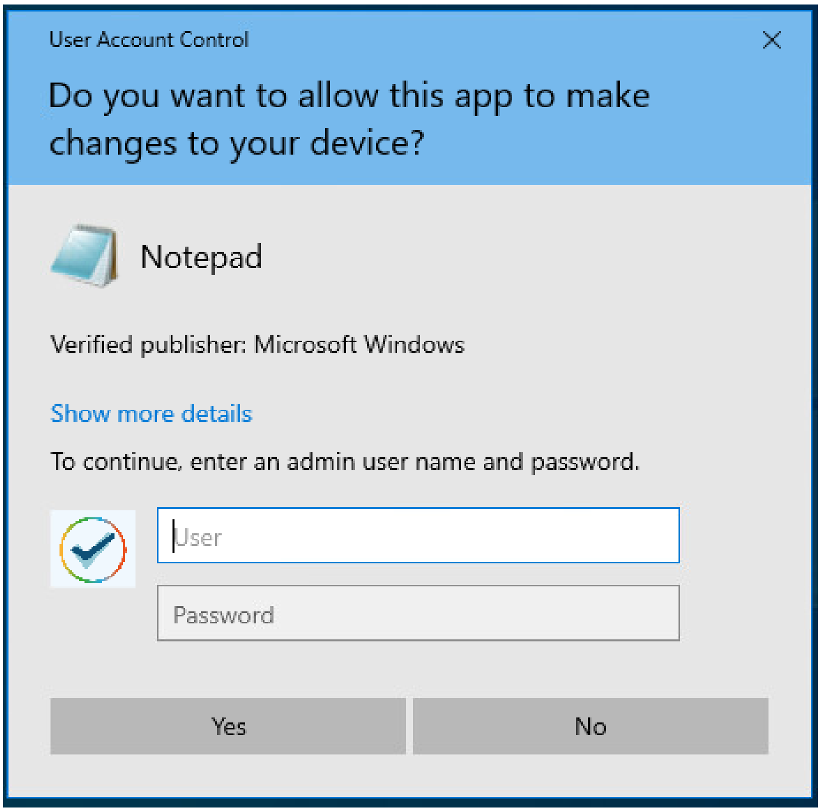
3.2.5 Password Expired

Windows passwords may expire after a set amount of time due to Windows configurations not managed in DoubleClue. When this happens, users are asked to change their password. By this, the DCCPW's Change Password scenario as described in the previous section is triggered.

This means users have to undergo MFA thrice; first for the failed login, secondly for the password change and finally to log in again with the new password.

3.2.6 User Account Control

User Account Control (or UAC) refers to a case when Windows requires credentials from the user for an action which is not any of the above mentioned scenarios. One common use-case of UAC is when a non-adminitstrator is logged in and triggers an action which requires elevated privileges. In this case, DCCPW is also triggered, and follows the same logic as the Login scenario.



User Account Control

Do you want to allow this app to make changes to your device?

Notepad

Verified publisher: Microsoft Windows

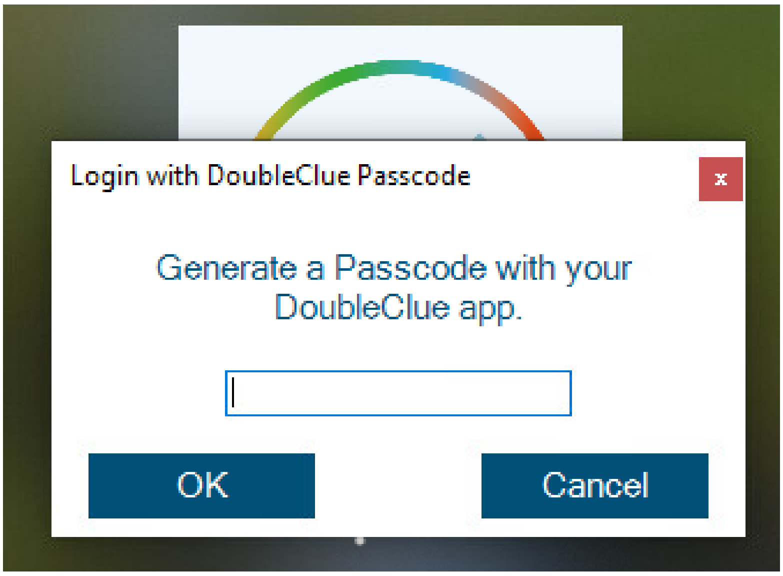
Show more details

To continue, enter an admin user name and password.

3.2.7 Offline Login

The majority of MFA methods provided by DCCPW need an active connection to DCEM to work. This can cause a problem if a user wants to log in or perform any of the other actions mentioned above on a Windows machine which has no connection to the internet or the internal network.

When a user attempts to log into Windows with DCCPW while their machine is offline, DCCPW will notice this after the user has entered their credentials. It will then prompt the user to perform an offline authentication with DoubleClue Passcode.



Login with DoubleClue Passcode

Generate a Passcode with your DoubleClue app.

The DoubleClue Passcode can be generated in the DoubleClue app. After opening their app, the user can generate a Passcode on the login screen. They don’t have to log into the app to generate a passcode. However, if they have several accounts added to their app, they need to choose the one they want to log into.

⚠ The DoubleClue Passcode will only be accepted by DCCPW if the app had been activated in DCEM prior to a successful online login **before** the offline login attempt.

Therefore, the user has to activate the app with an activation code for their account and then log into the app once. Afterwards, they have to successfully log into Windows with DCCPW while the Windows machine is online and connects to DCEM. From then on, DCCPW will recognize the app for further offline logins.

3.3 Confidential Network Server

DoubleClue Confidential Network Server (CNS) is a background service that allows a user to skip the authentication with DoubleClue if they log in via a trusted network server, for example from the office. The installation of CNS is optional and not required to use DCCPW.

During the login, DCCPW will try to connect with the CNS. If it receives a response with a valid signature, DCCPW gives the users direct access to Windows with username and password not demanding MFA.

To install and configure CNS follow the steps below. Execute the DoubleClue-CNS-X.X.X.exe on the server you want to set up as the confidential server. This will start the service running locally on the server. By default, it communicates with DCCPW through the port 4466. You can change the port in the **CnsConfig.json**, which is per default located in the **C:\Program Files\DoubleClue CNS\DCEM_HOME** folder. If you choose a custom folder during installation, the location will change accordingly.

After starting CNS, it generates the cnsCertificate.pem file. This PEM certificate can be found at **DoubleClue CNS\DCEM_HOME\certs**. It needs to be copied into the distribution configs folder in the DCCPW directory before the make_msi.bat is executed. You also need to define the IP and the port of the server on which CNS is running in the config.json of DCCPW before creating the msi. You can further set how many seconds DCCPW will wait for the CNS response and add a backup server which DCCPW will try to contact should it not get a connection with the main server added under ServerAddress. Be aware that you need to add a regular server address in order for CNS to work. If only a backup address is configured, DCCPW won't look for a CNS.

```
{
 "ServerAddress": "172.28.32.158",
 "BackupServerAddress": "172.34.125.174",
 "ServerPort": 4226,
 "ServerTimeoutSeconds": 2,
 "CredentialProviders": [
     {
       "CredentialProvider": {
       "Name": "Smartcard Reader Selection Provider",
        "Guid": "1b283861-754f-4022-ad47-a5eaaa618894",
        "Enable": false
    } …
]
}
```

4. Supported Systems

DCCPW was developed for Windows 10 64-bit. It doesn't support any other systems yet. We are looking into expanding compatibility to other versions of Windows. If you require DCCPW for a specific version of Windows which is not 10 64-bit, please contact us and we will inform you about any updates on the matter.