

# Implementing the challenge handler in Windows 8.1 Universal and Windows 10 UWP applications

## Overview

When trying to access a protected resource, the server (the security check) will send back to the client a list containing one or more **challenges** for the client to handle.

This list is received as a `JSON` object, listing the security check name with an optional `JSON` of additional data:

```
{
  "challenges": {
    "SomeSecurityCheck1": null,
    "SomeSecurityCheck2": {
      "some property": "some value"
    }
  }
}
```

The client should then register a **challenge handler** for each security check.

The challenge handler defines the client-side behavior that is specific to the security check.

## Creating the challenge handler

A challenge handler is a class responsible for handling challenges sent by the MobileFirst server, such as displaying a login screen, collecting credentials and submitting them back to the security check.

In this example, the security check is `PinCodeAttempts` which was defined in `Implementing the CredentialsValidationSecurityCheck (../security-check)`. The challenge sent by this security check contains the number of remaining attempts to login (`remainingAttempts`), and an optional `errorMsg`.

Create a C# class that extends `Worklight.SecurityCheckChallengeHandler`:

```
public class PinCodeChallengeHandler : Worklight.SecurityCheckChallengeHandler
{
}
```

## Handling the challenge

The minimum requirement from the `SecurityCheckChallengeHandler` class is to implement a constructor and a `HandleChallenge` method, that is responsible for asking the user to provide the credentials. The `HandleChallenge` method receives the challenge as an `Object`.

Learn more about the `SecurityCheckChallengeHandler` class in the user documentation.

Add a constructor method:

```
public PinCodeChallengeHandler(String securityCheck) {
  this.securityCheck = securityCheck;
}
```

In this `HandleChallenge` example, an alert is displayed asking to enter the PIN code:

```
public override void HandleChallenge(Object challenge)
{
    try
    {
        JObject challengeJSON = (JObject)challenge;

        if (challengeJSON.GetValue("errorMsg") != null)
        {
            if (challengeJSON.GetValue("errorMsg").Type == JTokenType.Null)
                errorMsg = "This data requires a PIN Code.\n";
        }

        await CoreApplication.MainView.CoreWindow.Dispatcher.RunAsync(CoreDispatcherPriority.Normal,
            async () =>
            {
                _this.HintText.Text = "";
                _this.LoginGrid.Visibility = Visibility.Visible;
                if (errorMsg != "")
                {
                    _this.HintText.Text = errorMsg + "Remaining Attempts: " + challengeJSON.GetValue("remainingAttempts");
                }
                else
                {
                    _this.HintText.Text = challengeJSON.GetValue("errorMsg") + "\n" + "Remaining Attempts: " + challengeJSON.GetValue("remainingAttempts");
                }

                _this.GetBalance.IsEnabled = false;
            });
    } catch (Exception e)
    {
        Debug.WriteLine(e.StackTrace);
    }
}
```

The implementation of `showChallenge` is included in the sample application.

If the credentials are incorrect, you can expect the framework to call `HandleChallenge` again.

## Submitting the challenge's answer

Once the credentials have been collected from the UI, use the `SecurityCheckChallengeHandler`'s `ShouldSubmitChallengeAnswer()` and `GetChallengeAnswer()` method to send an answer back to the security check. `ShouldSubmitChallengeAnswer()` returns a boolean indicating if the challenge response should be sent back to the security check. In this example `PinCodeAttempts` expects a property called `pin` containing the submitted PIN code:

```

public override bool ShouldSubmitChallengeAnswer()
{
    JObject pinJSON = new JObject();
    pinJSON.Add("pin", pinCodeTxt.Text);
    this.challengeAnswer = pinJSON;
    return this.shouldsubmitchallenge;
}

public override JObject GetChallengeAnswer()
{
    return this.challengeAnswer;
}

```

## Cancelling the challenge

In some cases, such as clicking a "Cancel" button in the UI, you want to tell the framework to discard this challenge completely.

To achieve this, override the `ShouldCancel` method.

```

public override bool ShouldCancel()
{
    return shouldsubmitcancel;
}

```

## Registering the challenge handler

In order for the challenge handler to listen for the right challenges, you must tell the framework to associate the challenge handler with a specific security check name.

This is done by initializing the challenge handler with the security check like this:

```

PinCodeChallengeHandler pinCodeChallengeHandler = new PinCodeChallengeHandler("PinCodeAttempts");

```

You must then **register** the challenge handler instance:

```

IWorklightClient client = WorklightClient.CreateInstance();
client.RegisterChallengeHandler(pinCodeChallengeHandler);

```

## Sample application

The sample **PinCodeWin8** and **PinCodeWin10** are C# applications that uses `ResourceRequest` to get a bank balance.

The method is protected with a PIN code, with a maximum of 3 attempts.

Click to download (<https://github.com/MobileFirst-Platform-Developer-Center/SecurityCheckAdapters/tree/release80>) the SecurityCheckAdapters Maven project.

Click to download (<https://github.com/MobileFirst-Platform-Developer-Center/PinCodeWin8/tree/release80>) the Windows 8 project.

Click to download (<https://github.com/MobileFirst-Platform-Developer-Center/PinCodeWin10/tree/release80>) the Windows 10 UWP project.

## Sample usage

- Use either Maven, MobileFirst CLI or your IDE of choice to build and deploy the available **ResourceAdapter** and **PinCodeAttempts** adapters (../../adapters/creating-adapters/).
- From a **Command-line** window, navigate to the project's root folder and run the command: `mfpdev app register`.
- Map the `accessRestricted` scope to the `PinCodeAttempts` security check:
  - In the MobileFirst Operations Console, under **Applications** → **PinCode** → **Security** → **Scope-Elements Mapping**, add a scope mapping from `accessRestricted` to `PinCodeAttempts`.
  - Alternatively, from the **Command-line**, navigate to the project's root folder and run the command: `mfpdev app push`.

Learn more about the `mfpdev app push/push` commands in the Using MobileFirst CLI to manage MobileFirst artifacts (../../using-the-mfpf-sdk/using-mobilefirst-cli-to-manage-mobilefirst-artifacts).

