NGINX App Protect Documentation

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Apr 23, 2021

CONTENTS:

CHAPTER

ONE

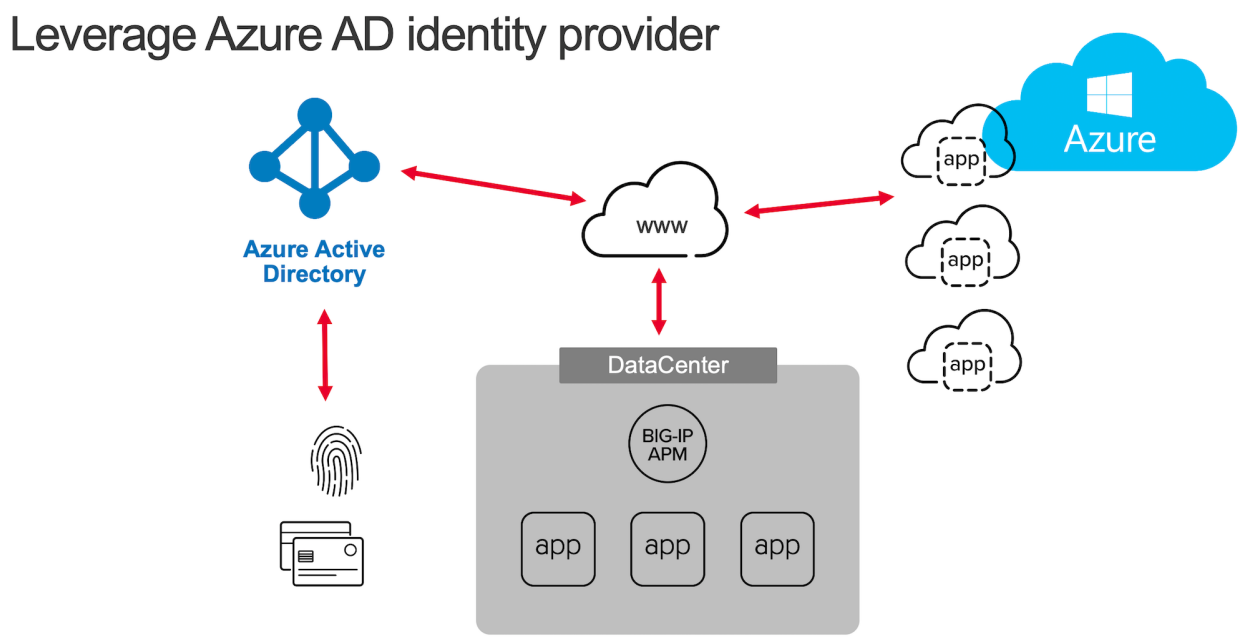
PUBLISH AND PROTECT ON-PREMS APPS WITH AZURE AD AS IDENTITY PROVIDER

Warning: For any remark or mistake in this lab, please send a Teams chat to Matthieu DIERICK.

In this lab, you will learn how to connect APM to Azure AD as IDaaS. Since v15.1, you can enable APM as SAML SP and Azure AD as SAML IDP. In this lab, we will use the new **Easy Button** Guided Configuration template. This template:

1. Publish on-prems apps
2. Enable Single Sign on
3. Interconnect (SAML binding) APM with Azure AD tenant

Note: You will notice we will never connect to Azure AD interface. APM will use Microsoft Graph API to configure AAD tenant accordingly.

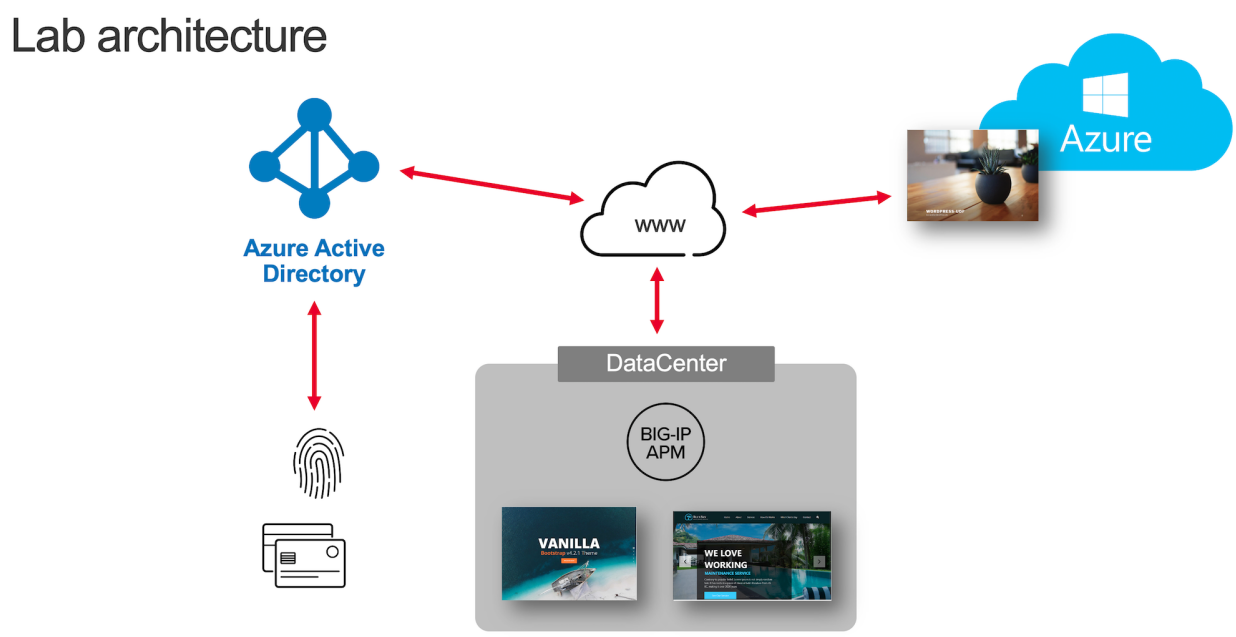


In the video below, you can see the use case. This is **not** the **lab video**, it is the public facing use case demo.

1.1 Class 1 - Check the Lab Architecture

In this class, we will protect 3 apps:

1. 2 internal apps
    1. `Vanilla` Application hosted in IIS
    2. `Skyblue` Application hosted in IIS
2. 1 cloud app hosted in Azure cloud
    1. `Wordpress-UDF` hosted in Azure cloud



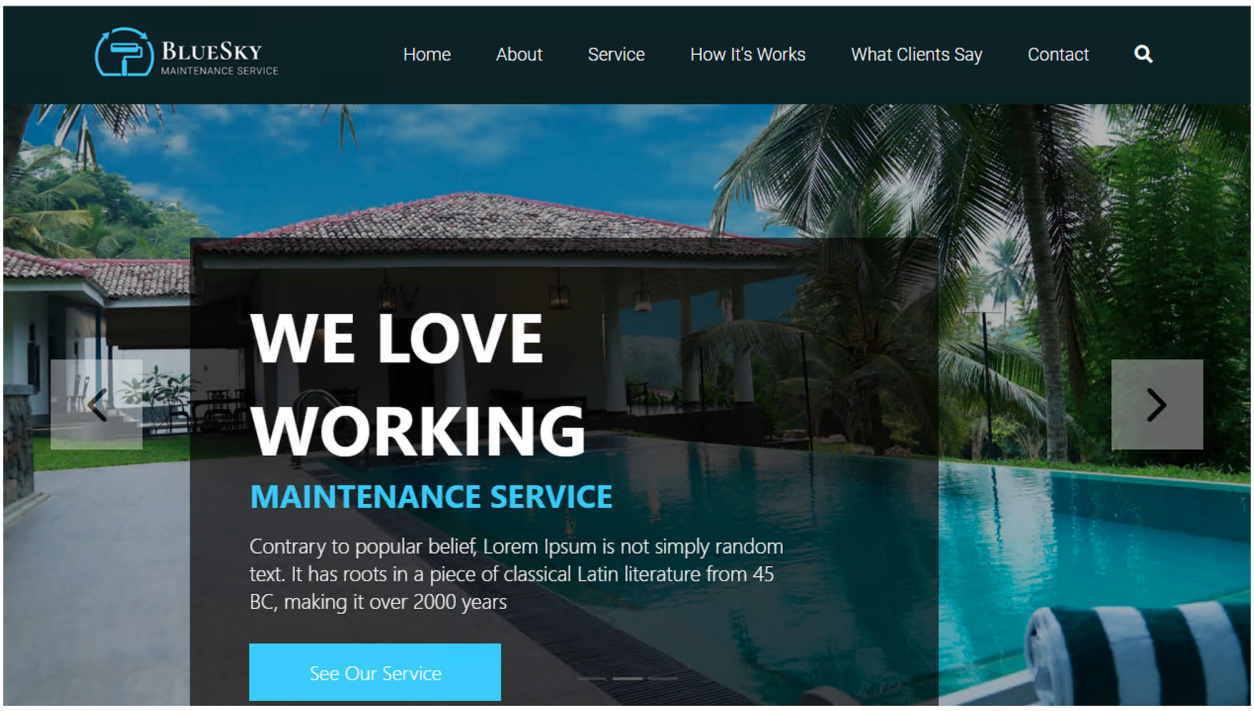
Class 1 - All sections

1.1.1 Architecture of Internal Apps

Bluesky application

This application resides on-prems in IIS server. Its FQDN is `https://bluesky.f5access.onmicrosoft.com`

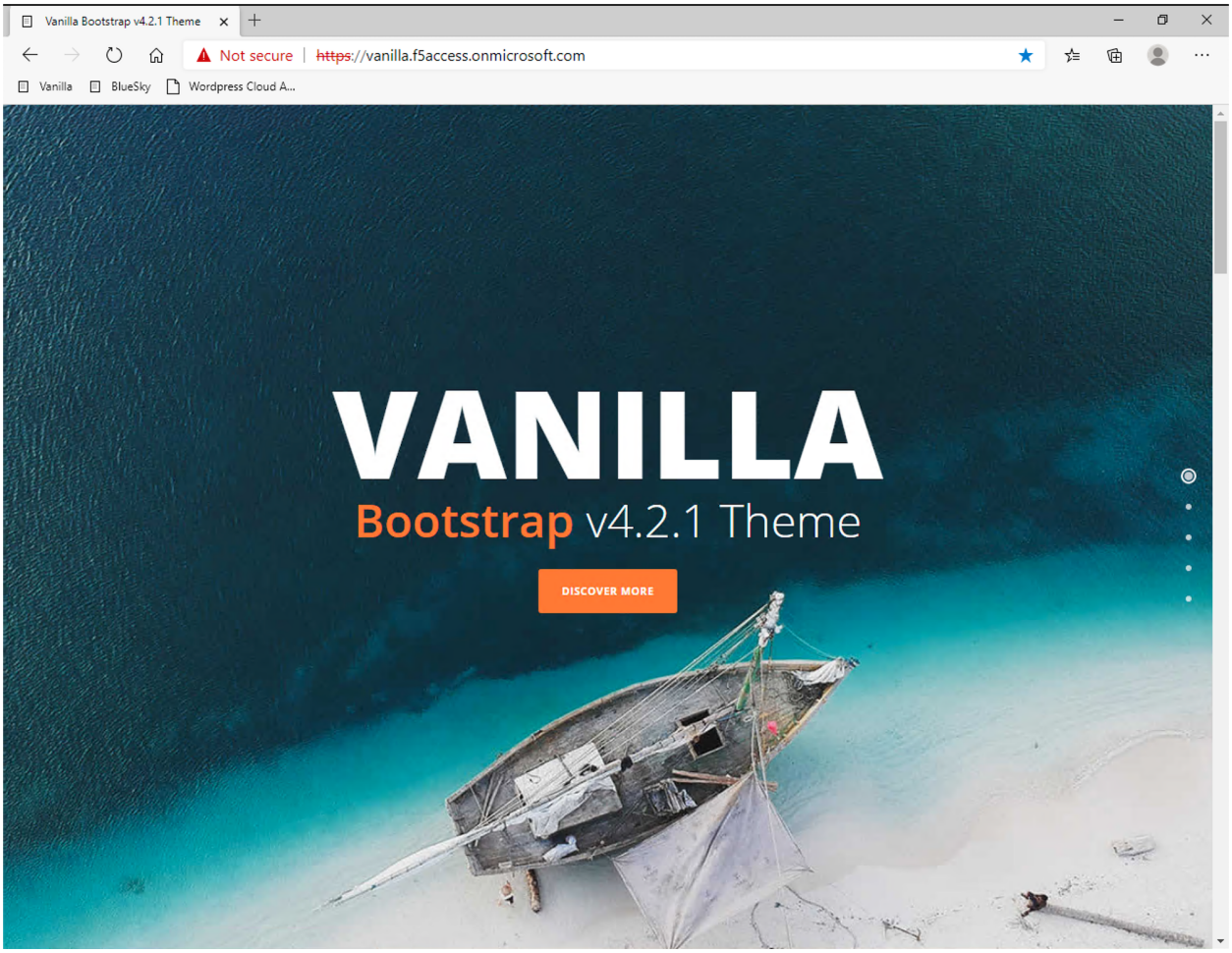
This application is not **authenticated**, meaning there is no **Single Sign on** required in front of this app.



Vanilla application

This application resides on-prems in IIS server. Its FQDN is `https://vanilla.f5access.onmicrosoft.com`

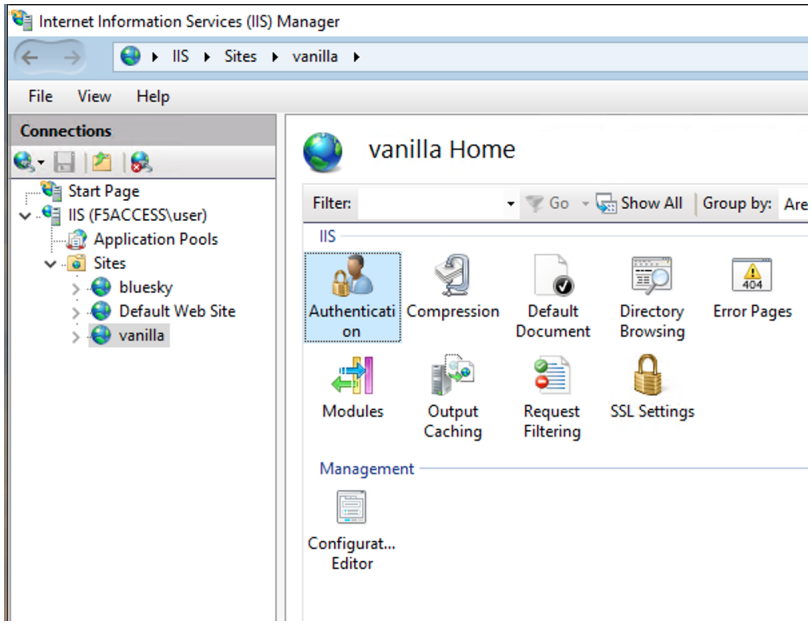
This application is **authenticated** by Kerberos. So a **Signle Sign On** will be required to connect to this app.



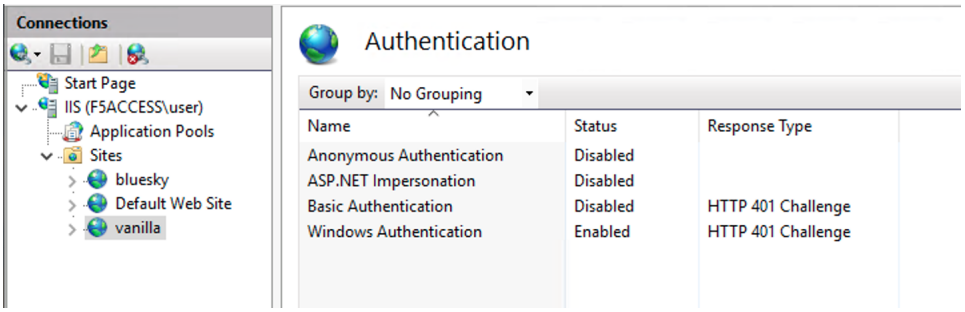
Check IIS configuration

1. RDP to IIS with `f5access\user` as user, and `user` as password
2. Click `IIS manager` icon in the taskbar

3. In the Connections tree, click on `vanilla` and `Authentication`



4. You can notice `Anonymous Auth` is **Disabled** and `Windows Authentication` is **Enabled**

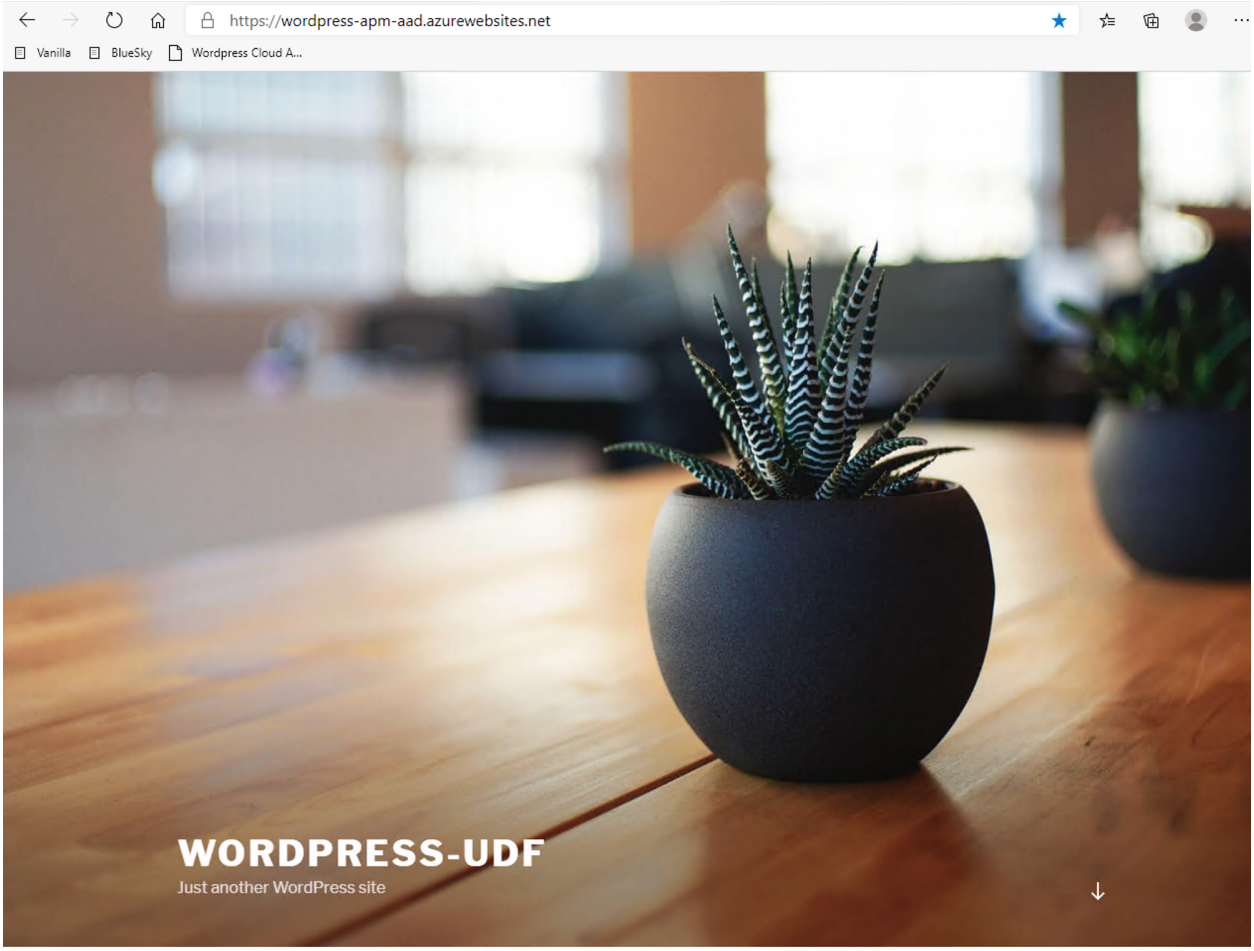


Note: In the next class we will configure APM to publish, protect and SSO to internal apps.

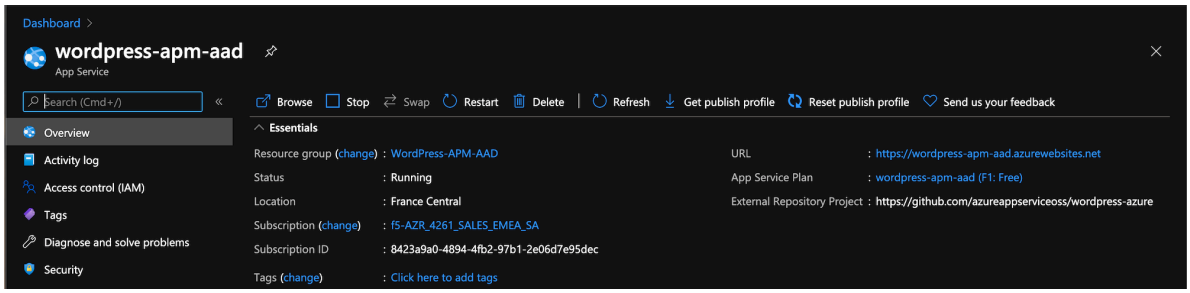
1.1.2 Architecture of Cloud App

Note: In this use case, we don't cover only internal, sensitive or legacy applications. In a real world, customers have applications on-prems and in the public cloud.

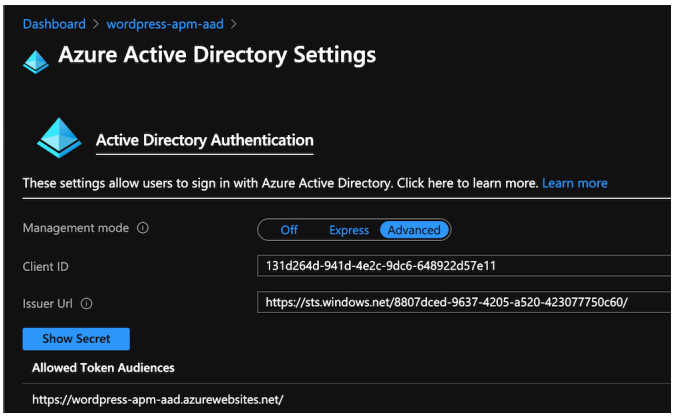
Note: A Wordpress application is already up and running in Azure Cloud at this address `https://wordpress-apm-aad.azurewebsites.net/`



1. This Wordpress application is an Azure App Service.



2. This App Service is already bound with our demo Azure AD tenant.

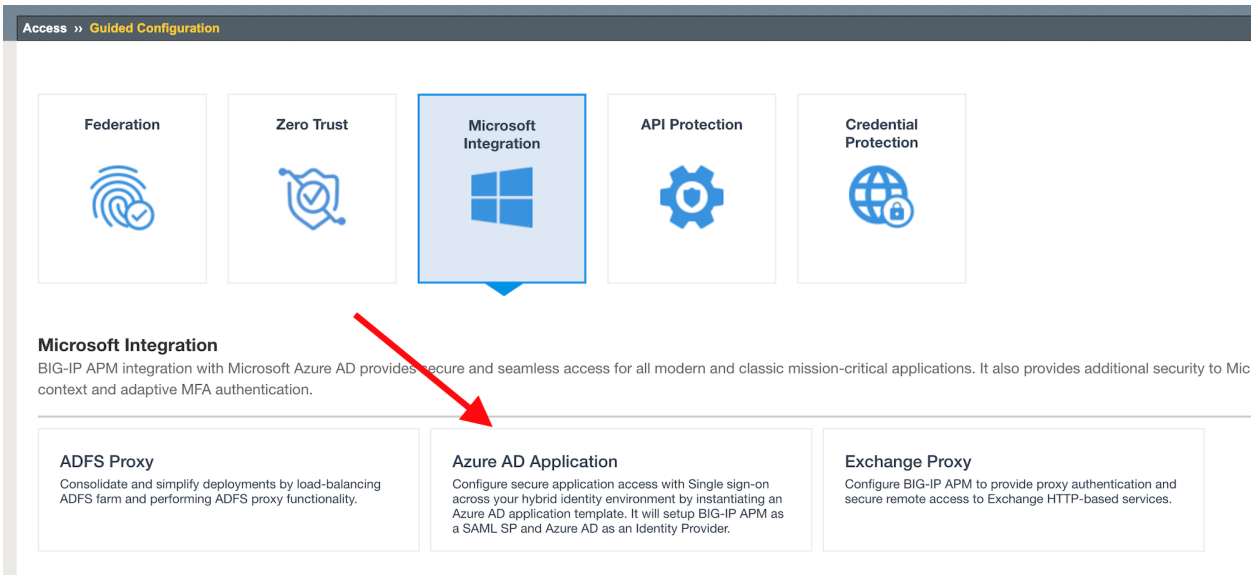


Warning: It is important to note this application is **not tied** to APM. APM only publishes and protects on-prems apps. All other cloud and SaaS apps are directly connected to Azure AD.

1.2 Class 2 - Deploy APM to protect on-prems apps

In this class, we will publish `Vanilla` and `Bluesky` applications hosted on-prems.

To do so, we will use Guided Configuration template `Azure AD Application`

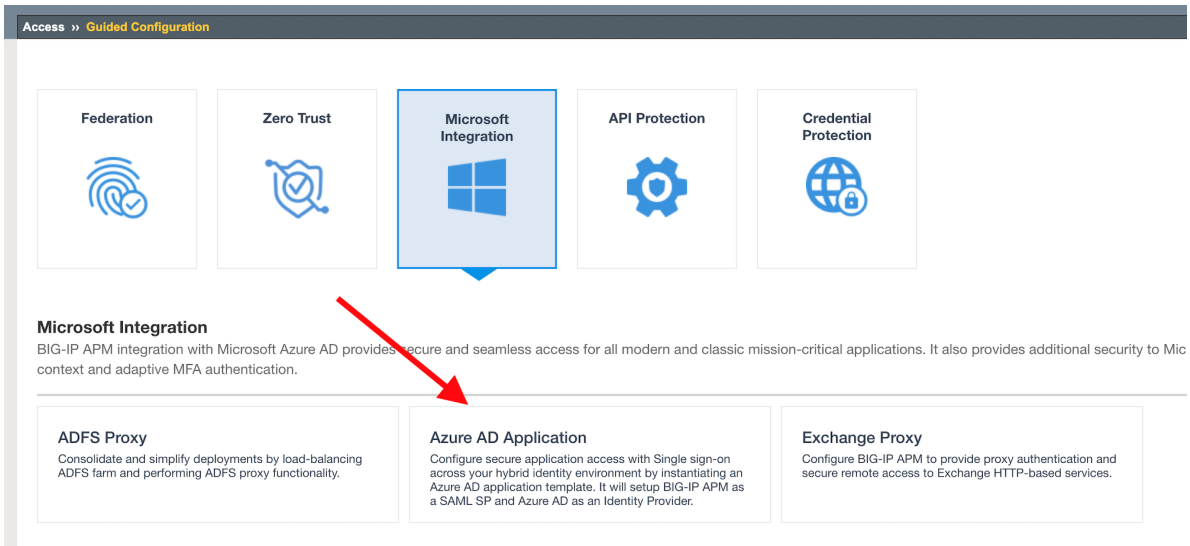


Class 2 - All sections

1.2.1 Publish and protect Bluesky app

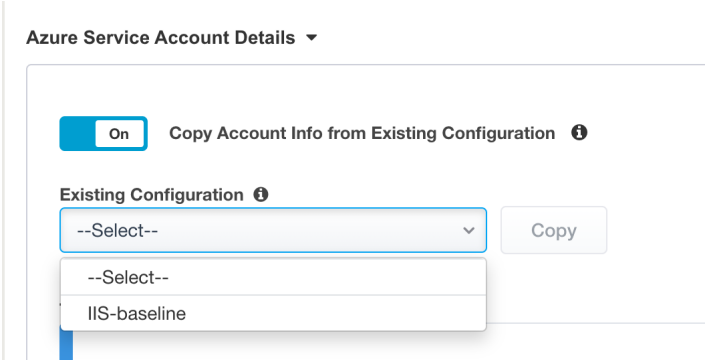
Let's start with `Bluesky` application. Reminder, Bluesky does not have any `Authentication` enabled.

1. Connect to BIG-IP HTTPS user interface from UDF as `admin` and password `admin`
2. In `Access > Guided Configuration`, select `Microsoft Integration > Azure AD application`



Configuration Properties

1. Click `Next` and start the configuration
2. Configure the page as below
   1. Configuration Name : `IIS-Bluesky-<My Name>` Why my name ? Because this app will be created in Azure AD tenant. And we need to differentiate all apps. Example : `IIS-Bluesky-Matt`
   2. In `Azure Service Account Details`, Select `Copy Account Info form Existing Configuration`, and select `IIS-baseline`, then click `Copy`

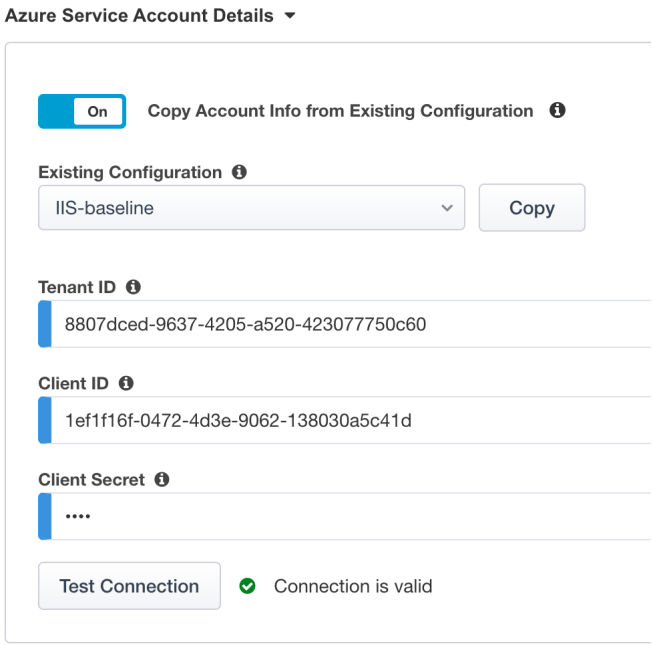


Note: In a real world, you will set here the values from the Azure Service Application created for APM. You have to create an Azure Application so that APM gets access to Microsoft Graph API. But for **security concerns**, I can't show in this lab the application secret.

Note: The steps to create this Azure applications are below

1. In Azure AD, create a service application under your organization's tenant directory using App Registration.
2. Register the App as Azure AD only single-tenant.
3. Request permissions for Microsoft Graph APIs and assign the following permissions to the application:
    1. Application.ReadWrite.All
    2. Application.ReadWrite.OwnedBy
    3. Directory.Read.All
    4. Group.Read.All
    5. Policy.Read.All
    6. Policy.ReadWrite.ApplicationConfiguration
    7. User.Read.All
4. Grant admin consent for your organization's directory.
5. Copy the Client ID, Client Secret, and Tenant ID and add them to the Azure AD Application configuration.

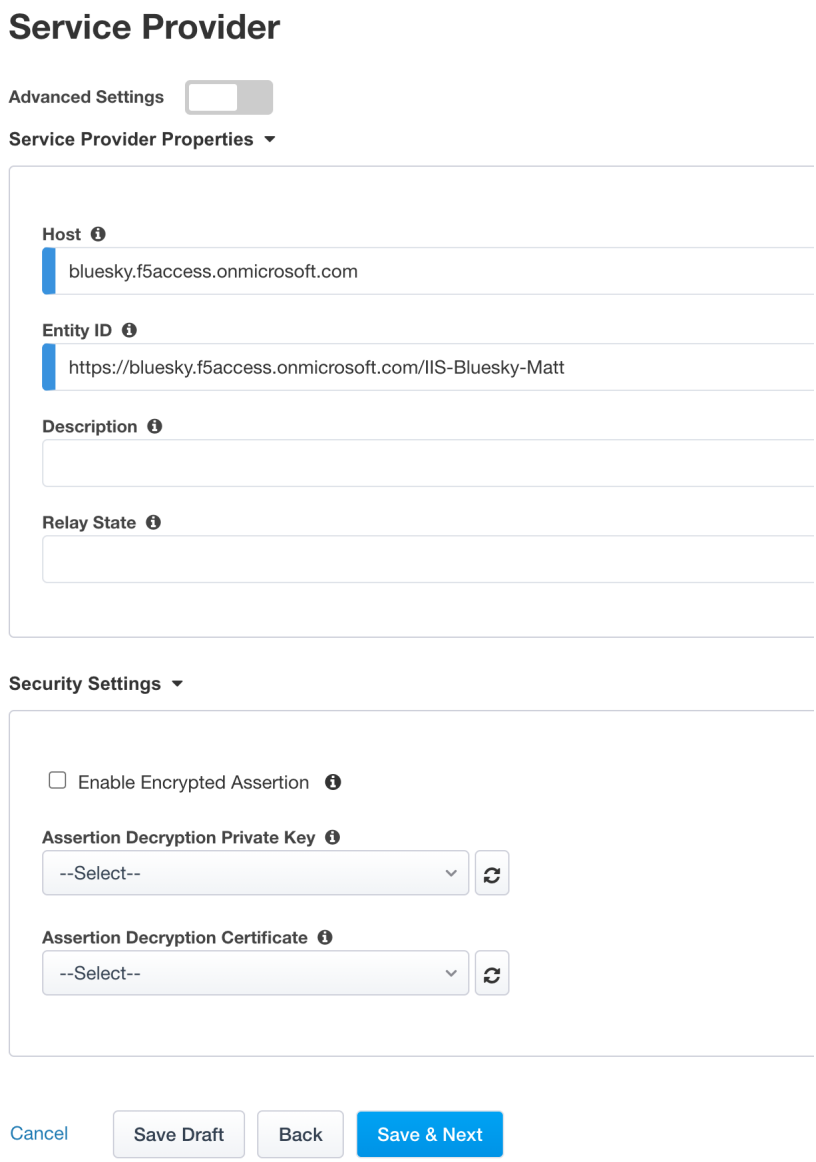
3. Click `Test Connection` button –> Connection is valid



4. Click `Next`

Service Provider

1. Configure the page as below
    1. Host `bluesky.f5access.onmicrosoft.com`
    2. Entity ID is auto-filled `https://bluesky.f5access.onmicrosoft.com/IIS-Bluesky-my name>`



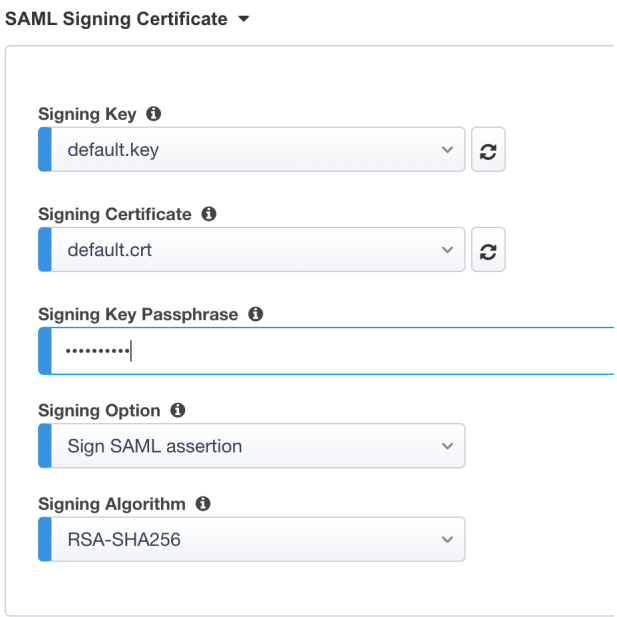
3. Click `Save & Next`

Azure Active Directory

1. Select `Azure BIG-IP APM Azure AD...` template

   Note: As you can notice, there are several templates available for different applications. Here, in this lab, we will publish a generic app. So we select the first template.

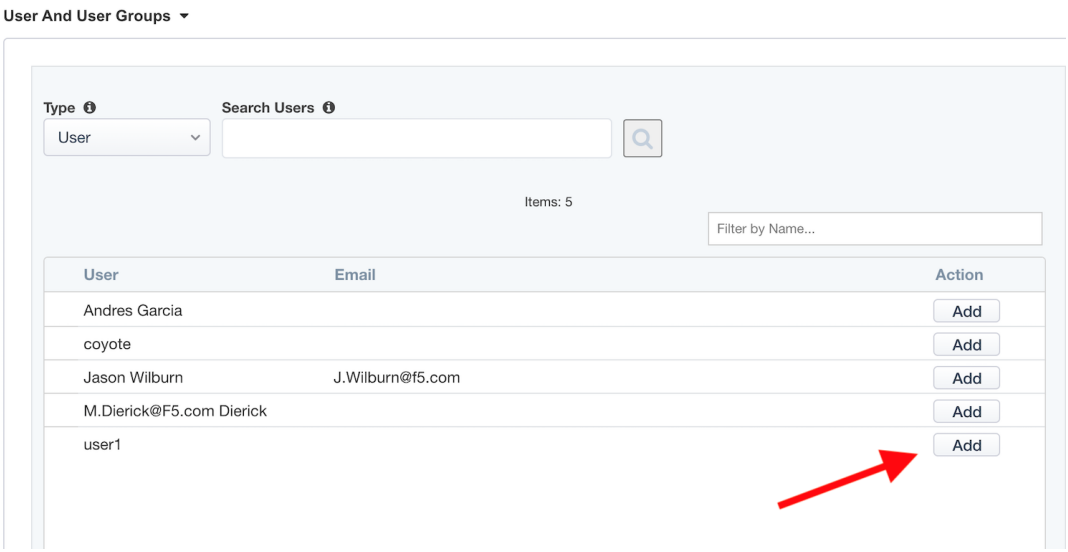
2. Click `Add`
3. In the new screen, configure as below
   1. Signing Key : `default.key`
   2. Signing Certificate : `default.crt`
   3. Signing Key Passphrase : `F5twister$`



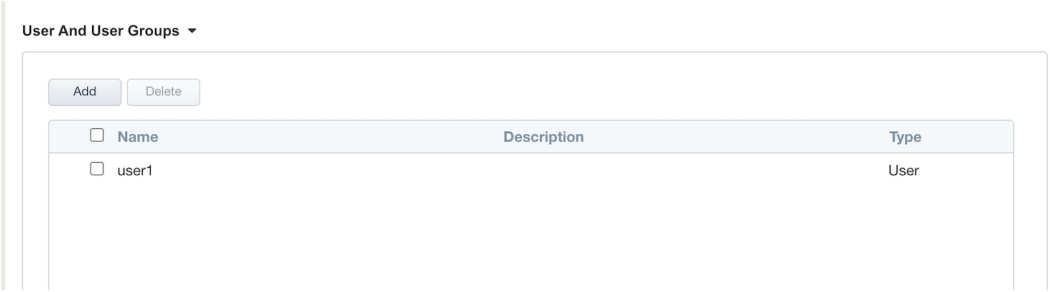
   4. In `User And User Groups`, click `Add`

      Note: We have to assign Azure AD users/group to this app, so that they can be allowed to connect to it.

      1. In the list, click `Add` for the user `user1`. If you can't find it, search for it in the `search` field.



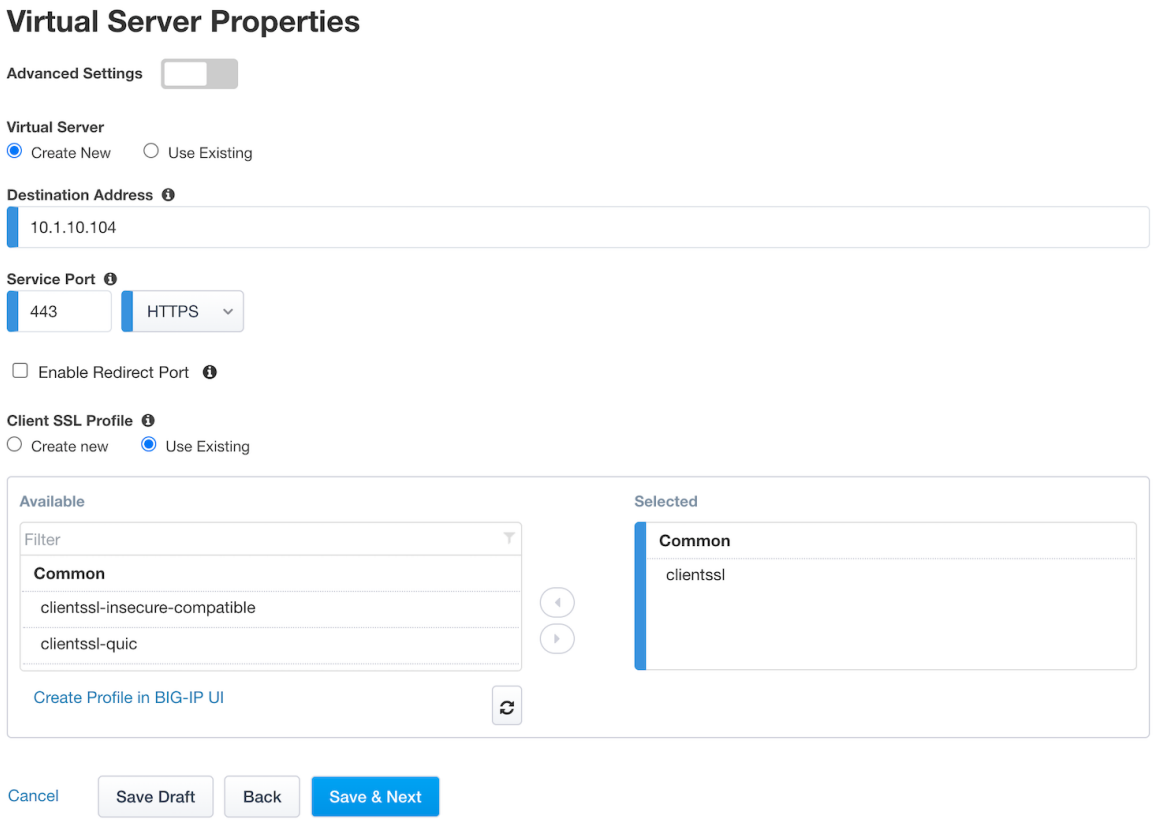
2. Click `Close`
3. You can see `user1` in the list.



4. Click `Save & Next`

Virtual Server Properties

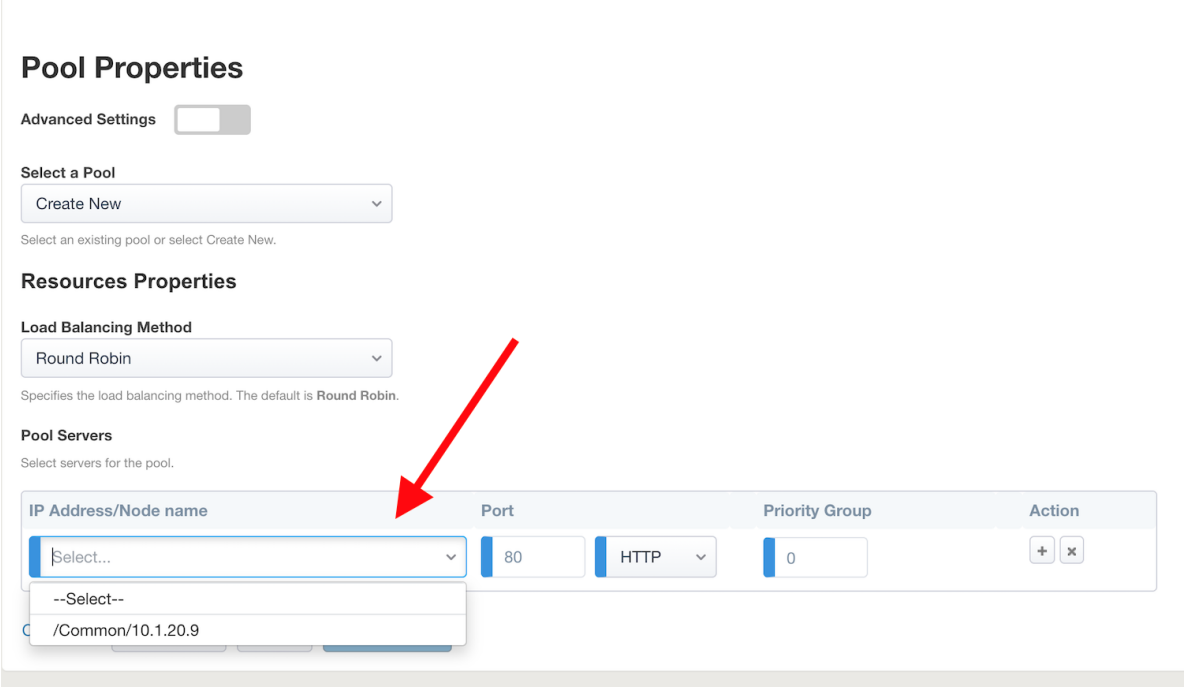
1. Configure the VS as below
   1. IP address : `10.1.10.104`
   2. `ClientSSL` profile. We will get a TLS warning in the browser, but it does not matter for this lab.



2. Click `Save & Next`

Pool Properties

1. Select `Create New`
2. In Pool Servers, select `/Common/10.1.20.9` This is the IIS server.

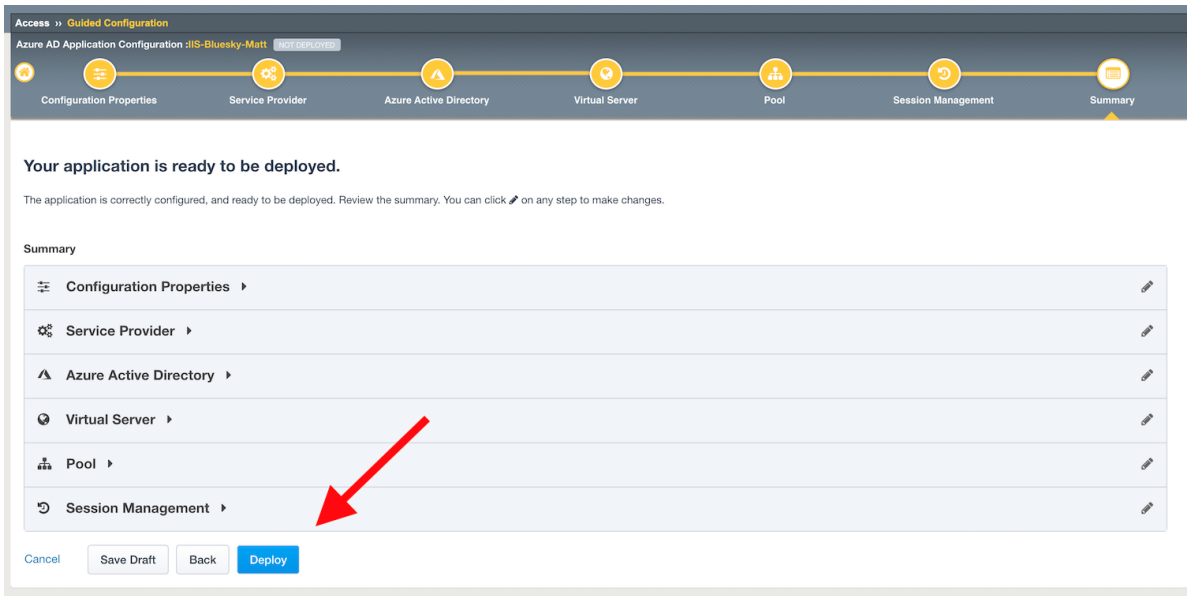


Session Management Properties

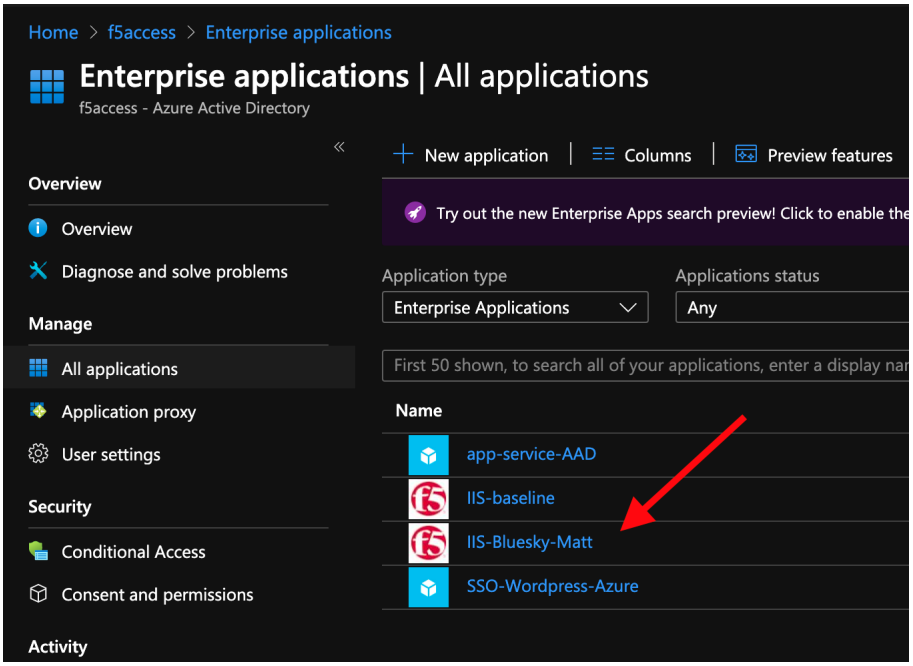
1. Nothing to change, click `Save & Next`

Deploy your app template

1. Click `Deploy`

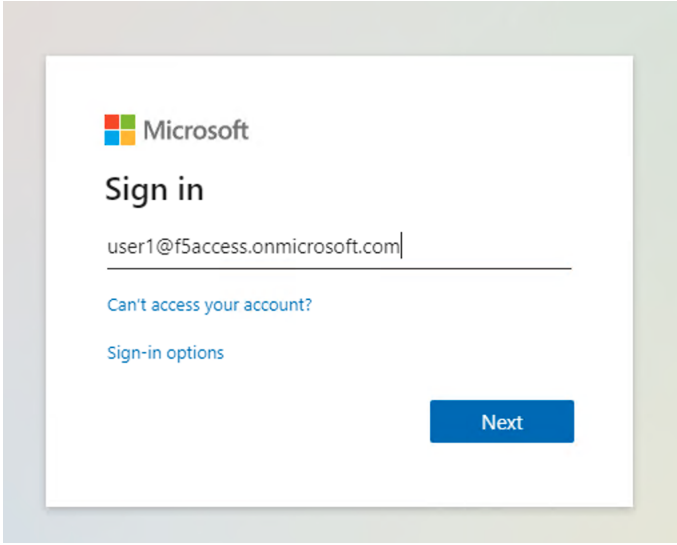


2. Behind the scene, the deployment creates an `Azure Enterprise Application` for `Bluesky`. We can see it in `Azure portal` (you don't have access in this lab). With this Enterprise Application, Azure knows where to redirect the user when authenticated. And this app has the certificate and key used to sign the SAML assertion.

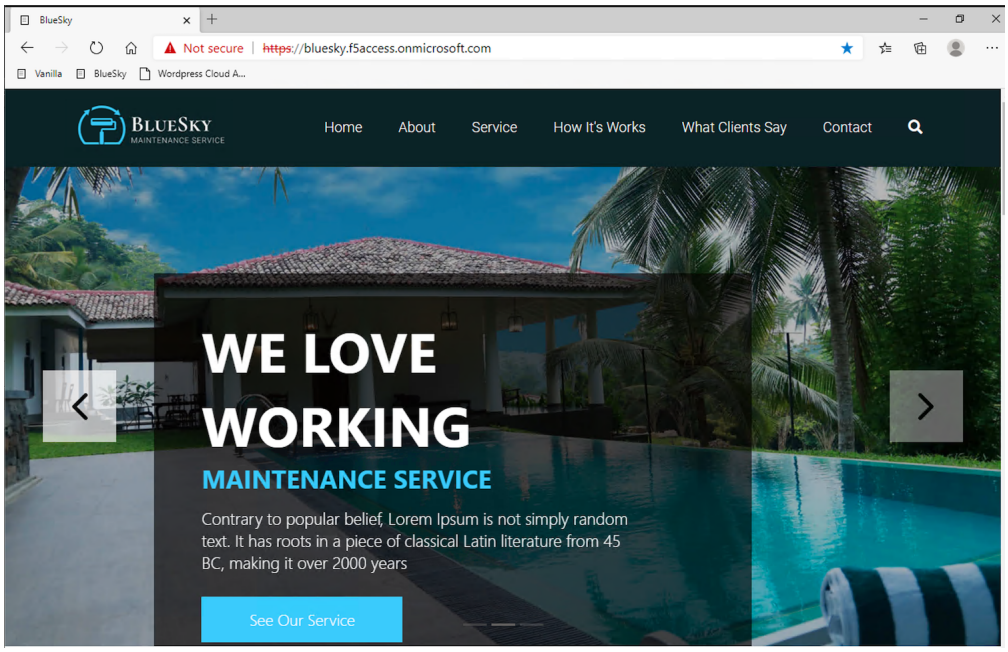


Test your deployment

1. RDP to Win10 machine as `user` and password `user`
2. Open `Microsoft Edge` browser - icon is on the Desktop
3. Click on the `bookmark Bluesky`
4. You will be redirected to Azure AD login page. Login as `user1@f5access.onmicrosoft.com`, and for the password please ask to your instructor.



5. You are redirected to APM with a SAML assertion, and can access to Bluesky application

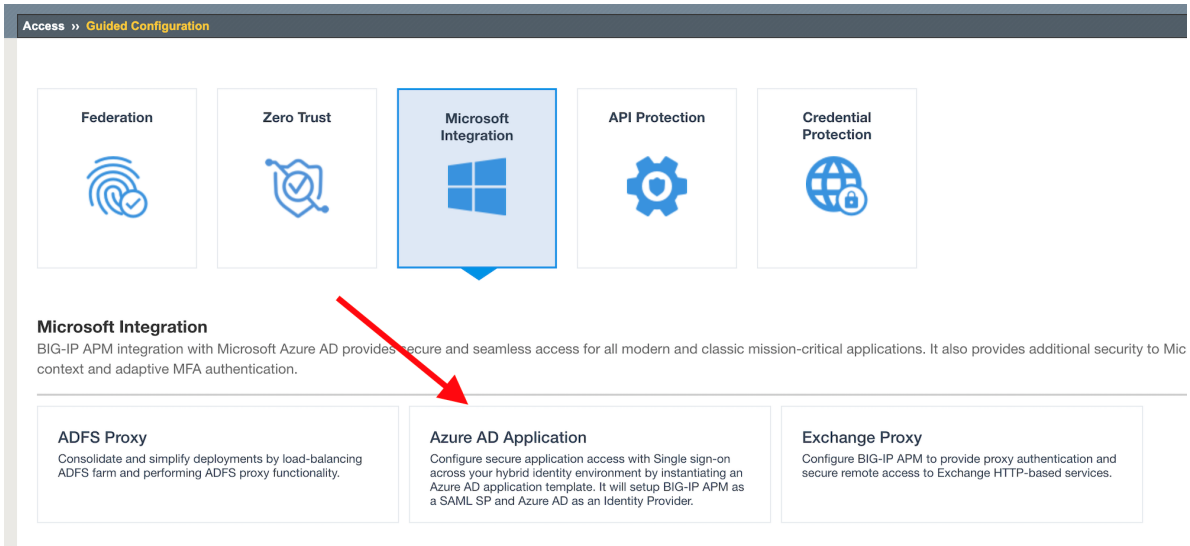


1.2.2 Publish and protect Vanilla app

Let's continue with `Vanilla` application. Reminder, Vanilla application as `Authentication` enabled with Kerberos auth. So, we will need to enable `Kerberos Constrained Delegation`.

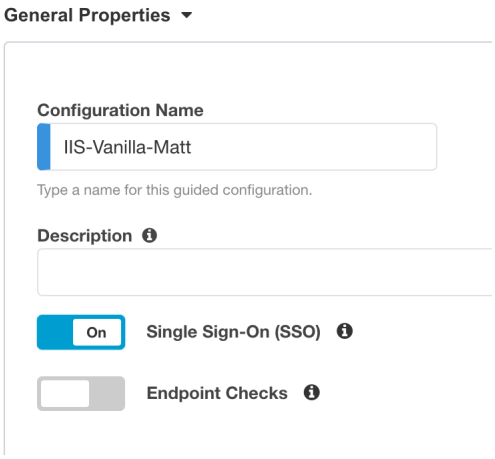
1. Connect to BIG-IP HTTPS user interface from UDF as `admin` and password `admin`
2. In `Access > Guided Configuration`, select `Microsoft Integration > Azure AD application`

Note: As you can notice, we deploy one template per application

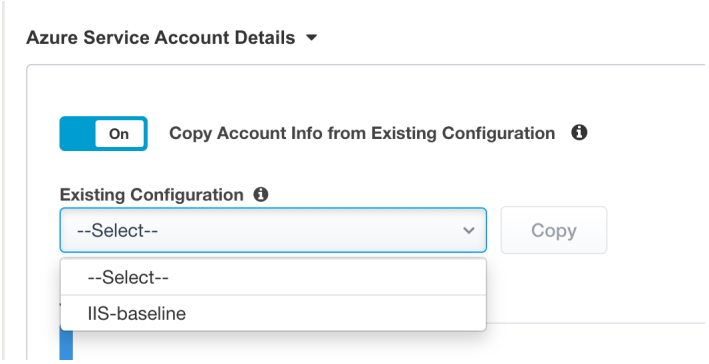


Configuration Properties

1. Click `Next` and start the configuration
2. Configure the page as below
   1. Configuration Name : `IIS-Vanilla-<My Name>` Why my name ? Because this app will be created in Azure AD tenant. And we need to differentiate all apps.
   2. Enable `Single Sign-on (SSO)`



   3. In `Azure Service Account Details`, Select `Copy Account Info form Existing Configuration`, and select `IIS-baseline`, then click `Copy`



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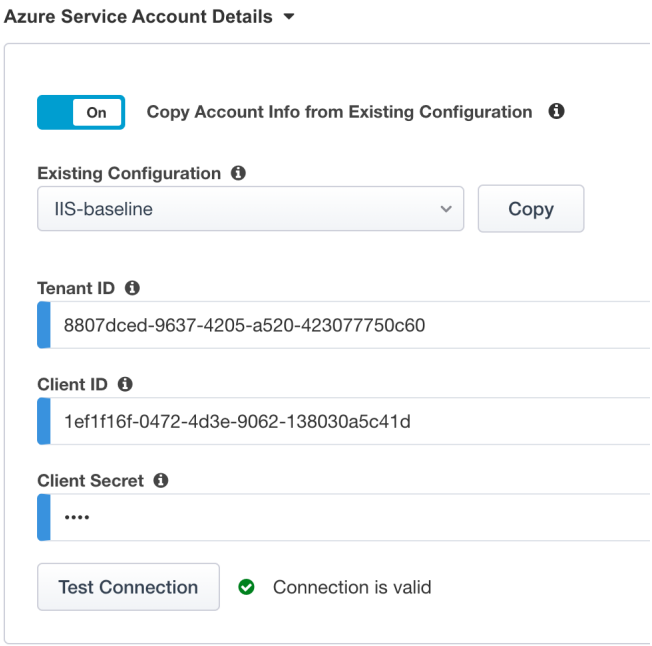
    3. Directory.Read.All
    4. Group.Read.All
    5. Policy.Read.All
    6. Policy.ReadWrite.ApplicationConfiguration
    7. User.Read.All
4. Grant admin consent for your organization's directory.
5. Copy the Client ID, Client Secret, and Tenant ID and add them to the Azure AD Application configuration.

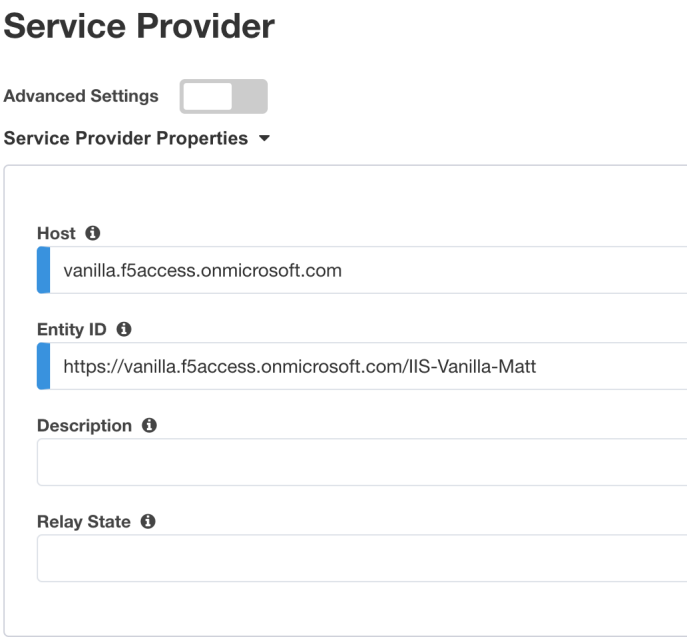
4. Click `Test Connection` button –> Connection is valid



5. Click Next

Service Provider

1. Configure the page as below
   1. Host `vanilla.f5access.onmicrosoft.com`
   2. Entity ID is auto-filled `https://vanilla.f5access.onmicrosoft.com/IIS-Bluesky-my name>`



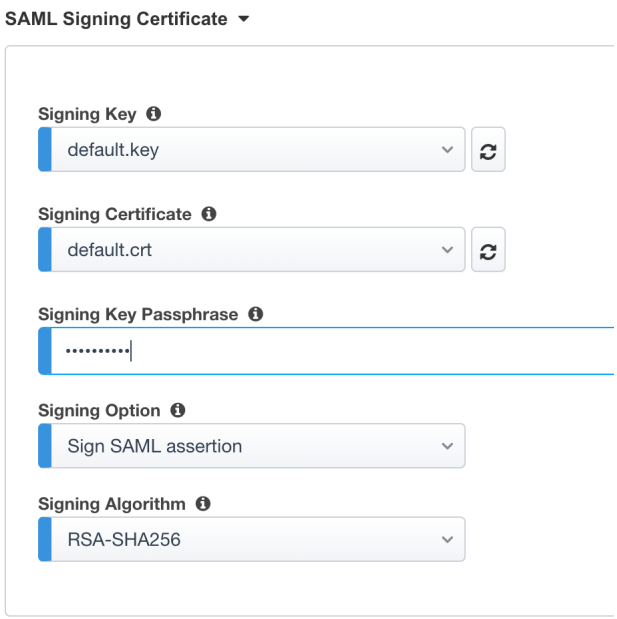
3. Click `Save & Next`

Azure Active Directory

1. Select `Azure BIG-IP APM Azure AD...` template

> **Note:** As you can notice, there are several templates available for different applications. Here, in this lab, we will publish a generic app. So we select the first template.

2. Click `Add`
3. In the new screen, configure as below.
   1. Signing Key : `default.key`
   2. Signing Certificate : `default.crt`
   3. Signing Key Passphrase : `F5twister$`



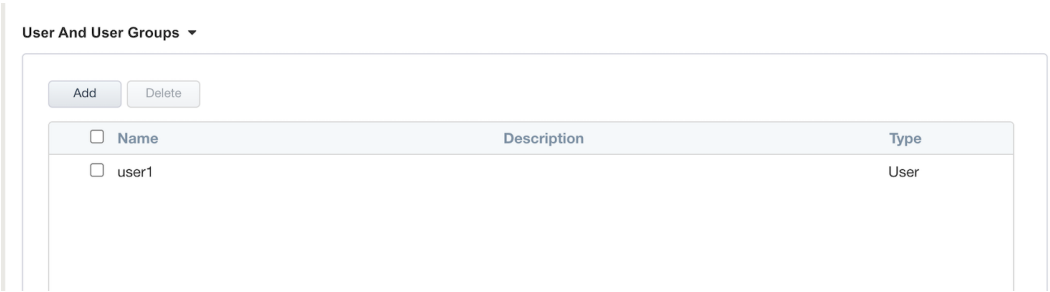
4. In `User And User Groups`, click `Add`

> **Note:** We have to assign Azure AD users/group to this app, so that they can be allowed to connect to it.

   1. In the list, click `Add` for the user `user1`. If you can't find it, search for it in the `search` field.

`class2/module2/../pictures/module2/user.png`

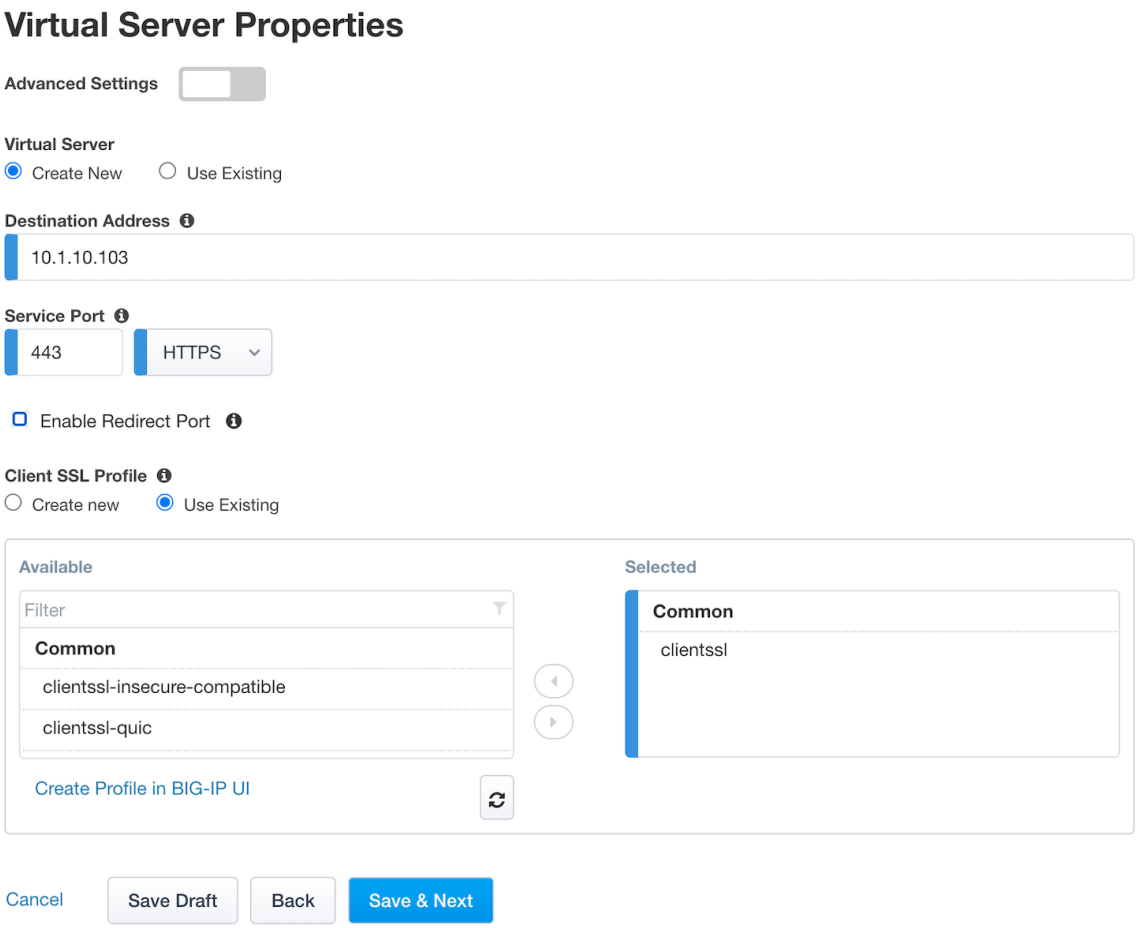
2. Click `Close`
3. You can see `user1` in the list.



4. Click `Save & Next`

Virtual Server Properties

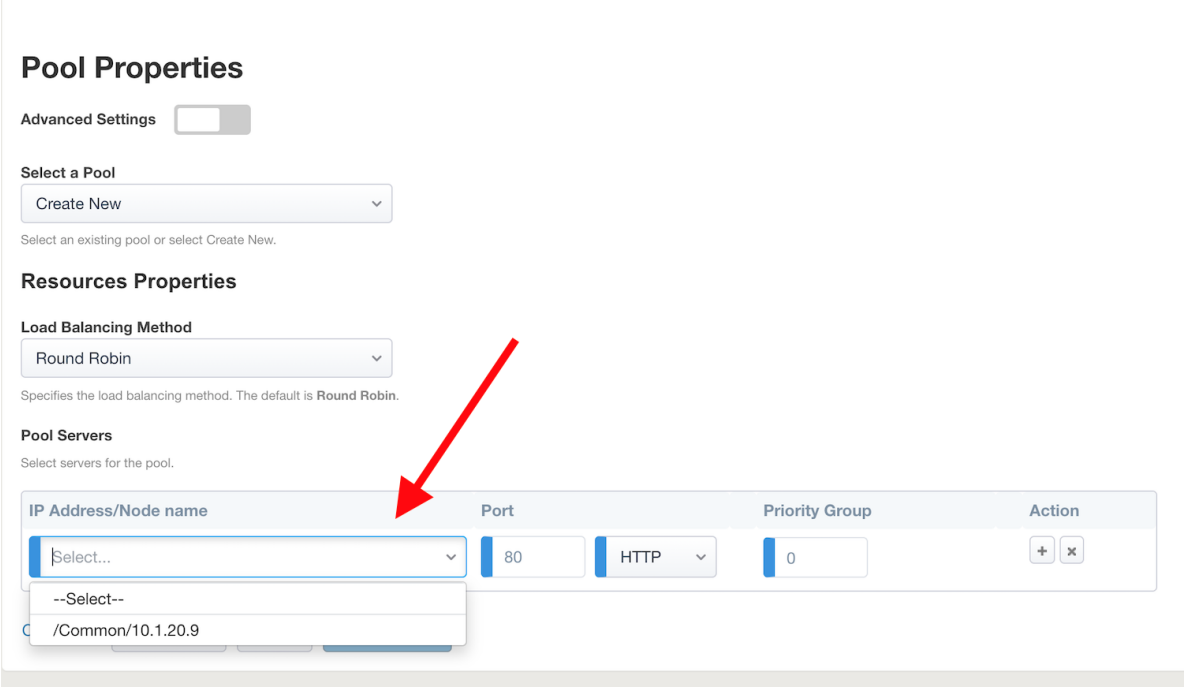
1. Configure the VS as below
    1. IP address : `10.1.10.103`
    2. `ClientSSL` profile. We will get a TLS warning in the browser, but it does not matter for this lab.



2. Click `Save & Next`

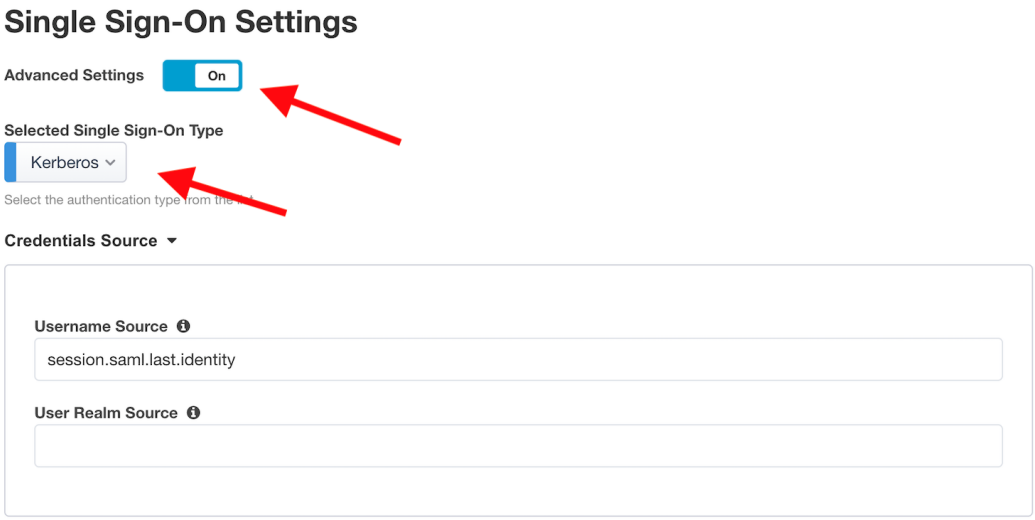
Pool Properties

1. Select `Create New`
2. In Pool Servers, select `/Common/10.1.20.9` This is the IIS server.



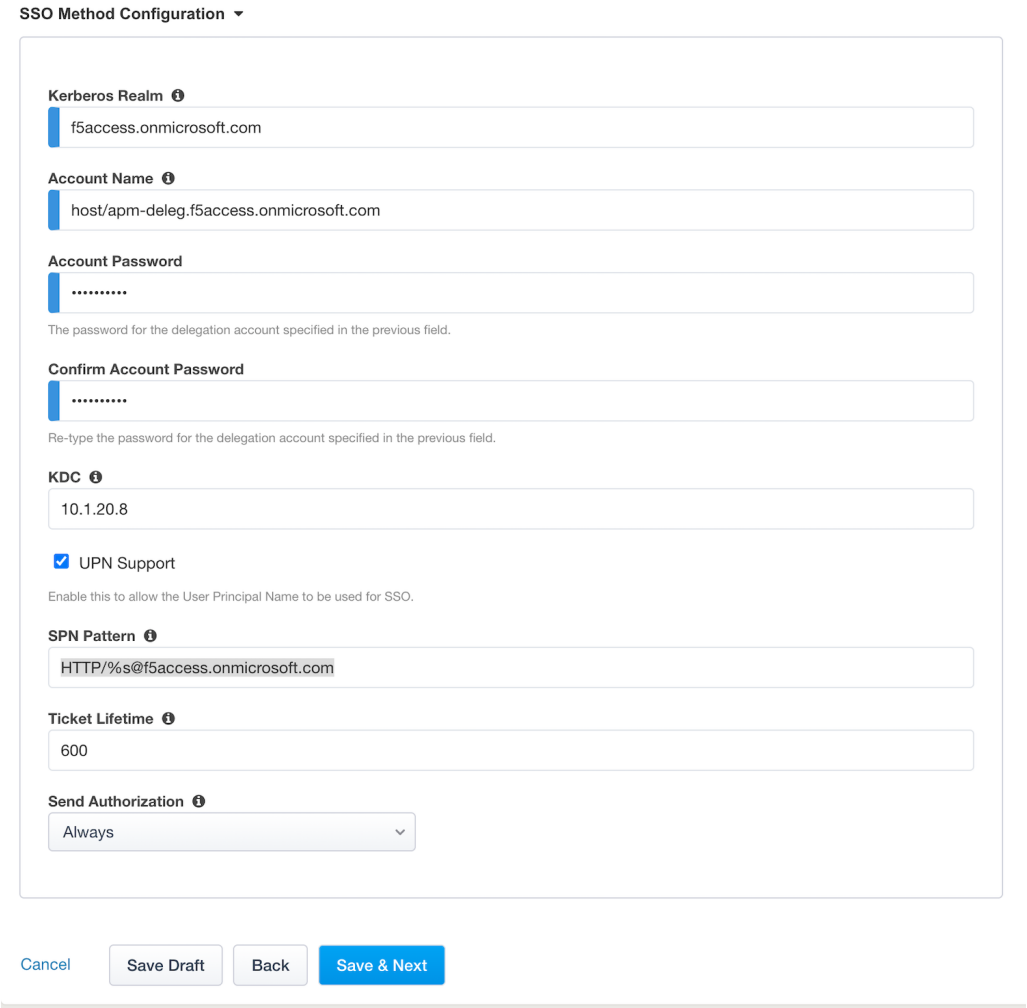
Single Sign-On Settings

1. In `Selected Single Sign-on Type`, select `Kerberos`, and select `Advanced Settings`



2. In `Credentials Source`, fill as below
   1. Username Source : `session.saml.last.identity`
   2. Delete User Realm Source value - keep it empty. The domain is similar between Azure AD and on-prems AD.
3. In `SSO Method Configuration`, fill as below
   1. Kerberos Realm : `f5access.onmicrosoft.com`

2. Account name : `host/apm-deleg.f5access.onmicrosoft.com`
3. Account Password : `F5twister$`
4. KDC : `10.1.20.8`
5. UPN Support : `Enaled`
6. SPN Pattern : `HTTP/%s@f5access.onmicrosoft.com`



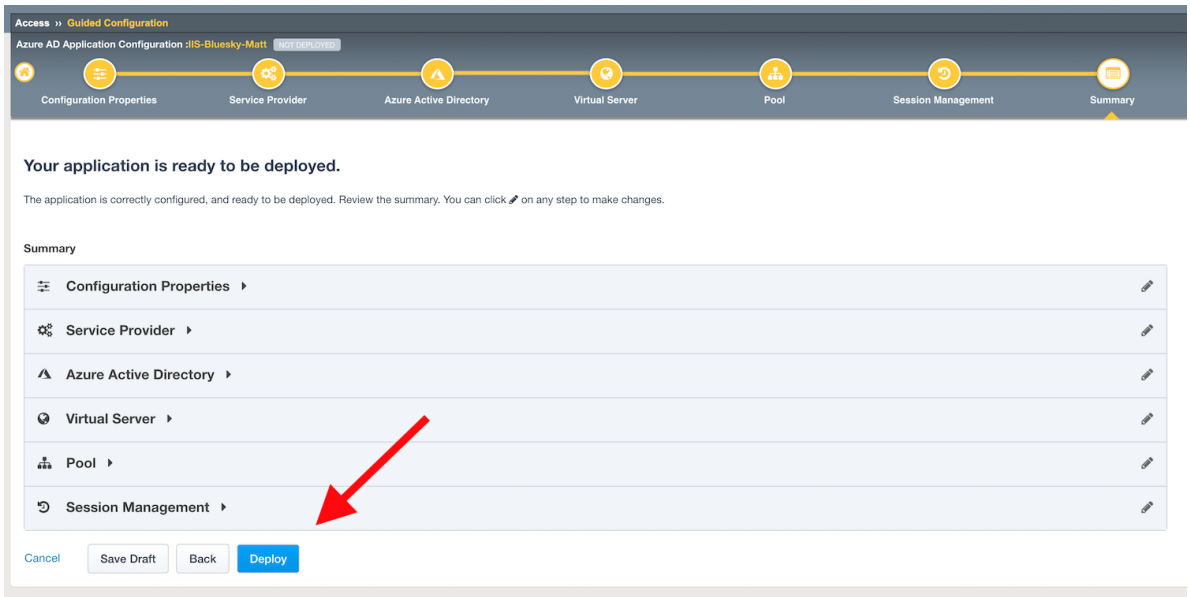
4. Click `Save & Next`

Session Management Properties

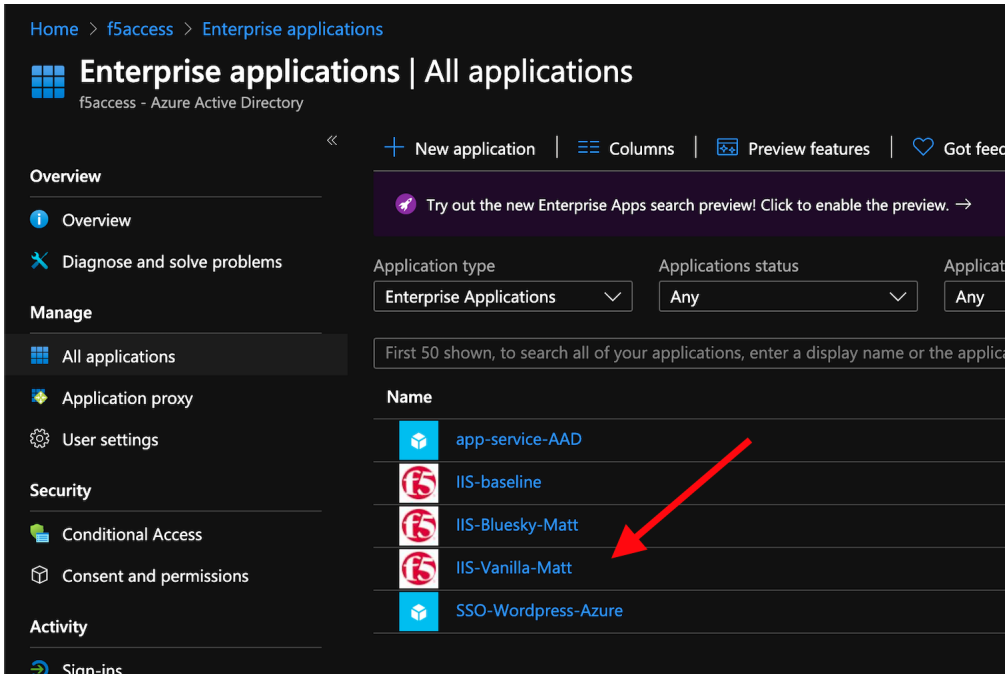
1. Nothing to change, click `Save & Next`

Deploy your app template

1. Click `Deploy`

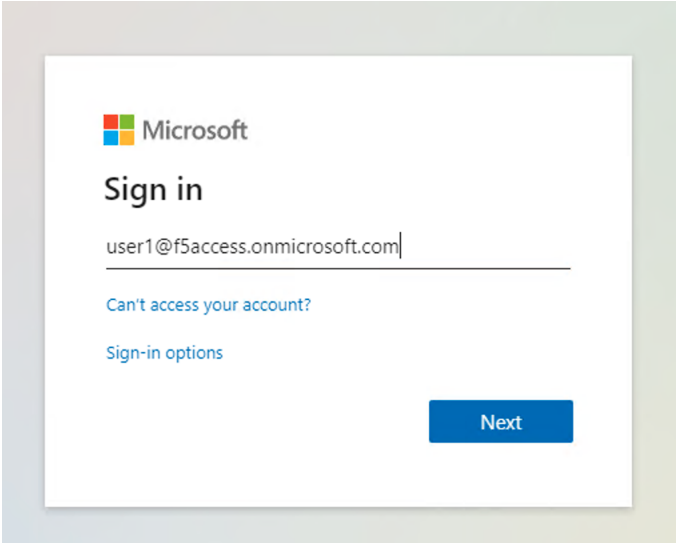


2. Behind the scene, the deployment creates an `Azure Enterprise Application` for `Bluesky`. We can see it in `Azure portal` (you don't have access in this lab). With this Enterprise Application, Azure knows where to redirect you when authenticated. And this app has the certificate and key used to sign the SAML assertion.

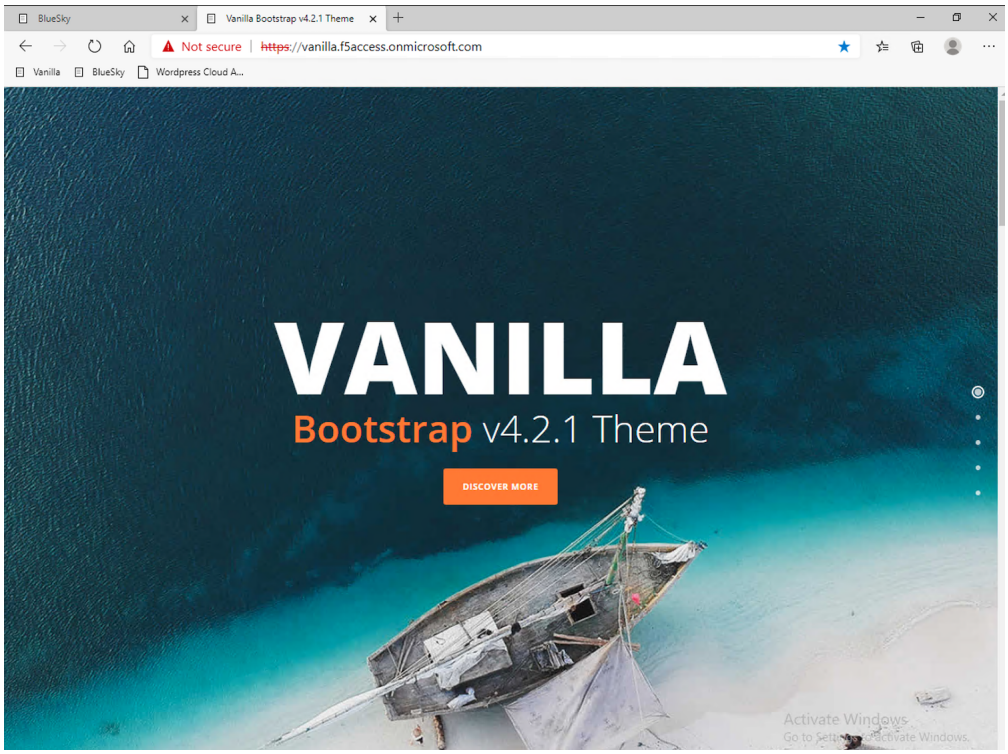


Test your deployment

1. RDP to Win10 machine as `user` and password `user`
2. Open `Microsoft Edge` browser - icon is on the Desktop
3. Click on the `bookmark Vanilla`
4. You will be redirected to Azure AD login page - only if your previous session with `Bluesky` expired in APM. Login as `user1@f5access.onmicrosoft.com`, and for the password please ask to your instructor (if you are prompted). But as you already authenticated against Azure AD, you still have a session in Azure AD.



5. You are redirected to APM with a SAML assertion, and can access to Vanilla application.
6. APM did `Single Sign-on` with Vanilla application (Kerberos Constrained Delegation)



7. Click `Bluesky` bookmark, you can access `Bluesky` application as well.
8. Extra lab, enable `Inspect mode` in Edge, and follow the SAML redirections to understand the workflow.

1.3 Class 3 - Leverage Azure AD to protect Cloud Apps

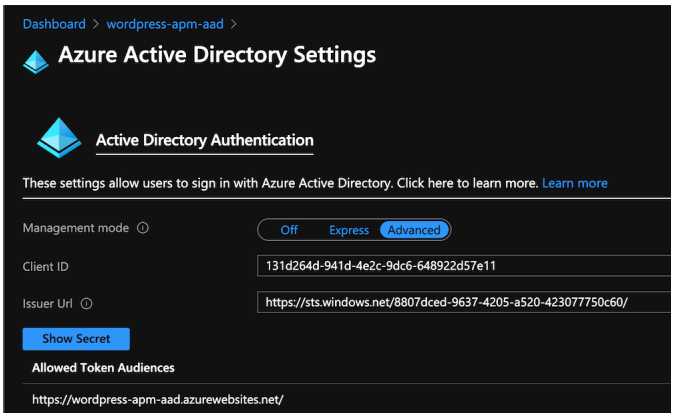
In this class, we will check that `user1` can access any cloud app federated with Azure AD.

1.3.1 The current config

In a real world, companies deploy applications `on-prems` and in `public clouds`. If the company uses **Azure AD as IDaaS**, it will federate all cloud apps with this Azure AD tenant.

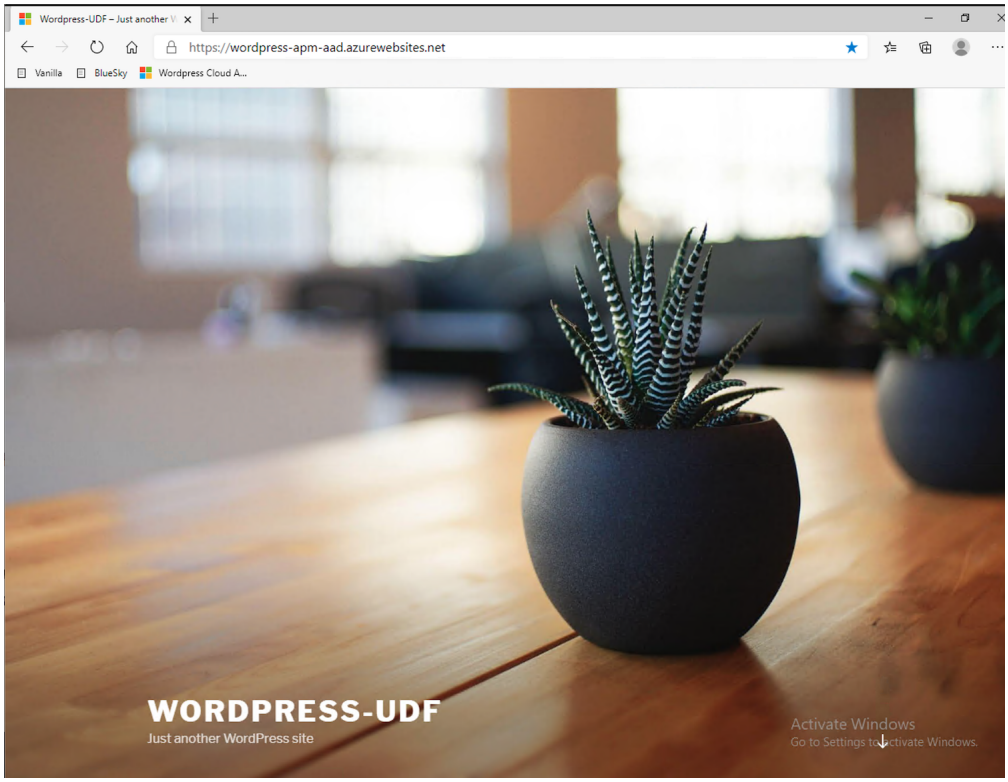
This is what we prepared for you in this lab. This application is **federated** with our Azure AD tenant.

You have **nothing** to configure on APM side, as everything is dealed between the `cloud app` and `Azure AD`. In Azure portal, we configured `Oauth` for the cloud app, so that every user reaching this app will be redirected to Azure login page.



1.3.2 Test your deployment

1. RDP to Win10 machine as `user` and password `user`
2. Open `Microsoft Edge` browser - icon is on the Desktop
3. Click on the `bookmark` `Wordpress Cloud App`
4. You will be redirected to Azure AD login page (it can take a while - look at the address bar). Login as `user1@f5access.onmicrosoft.com`, and for the password please ask to your instructor (if prompted). You already have a session up and running in Azure AD, from previous class.
5. You are redirected to the `cloud app` in Azure cloud, and can access to Wordpress-UDF application.



1.4 Class 4 - Enable MFA

Warning: You can **not** run this class without a F5 SA or F5 SME-UA lead. Please reach out to your local SA/SME-UA lead in order to activate an temporary account for you.

1. EMEA : Matthieu
2. USA : Jason or Shannon
3. APCJ : Shain

In this class, we will use another user account (created by SA/SME-UA), with MFA enabled for this account.

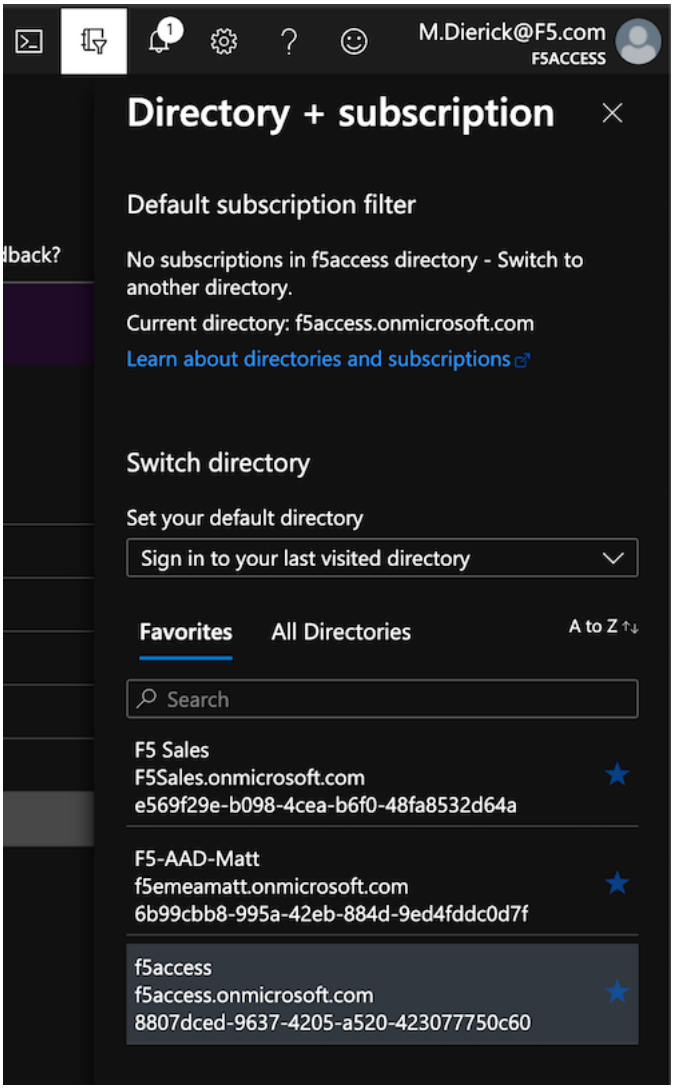
Let's say, a SA/SME created the account `matt@f5access.onmicrosoft.com` for me. Then he enabled the MFA for this account.

Class 4 - All sections

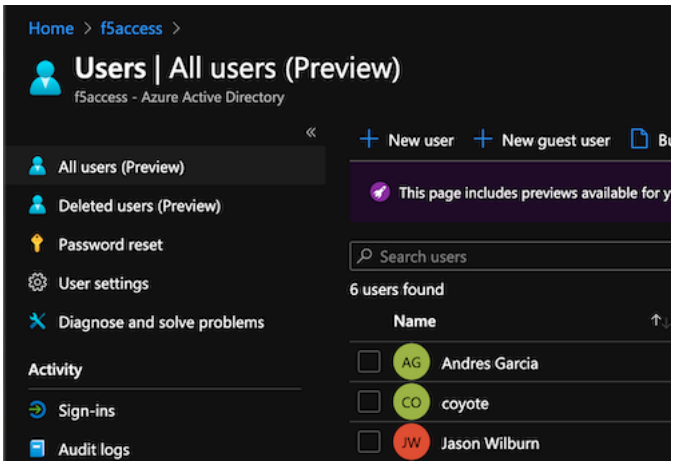
1.4.1 Procedure for SA/SME

Warning: Only SA and SME-UA with administrator role on this demo tenant, can create users. If you are not a SA or SME lead, move to the next section.

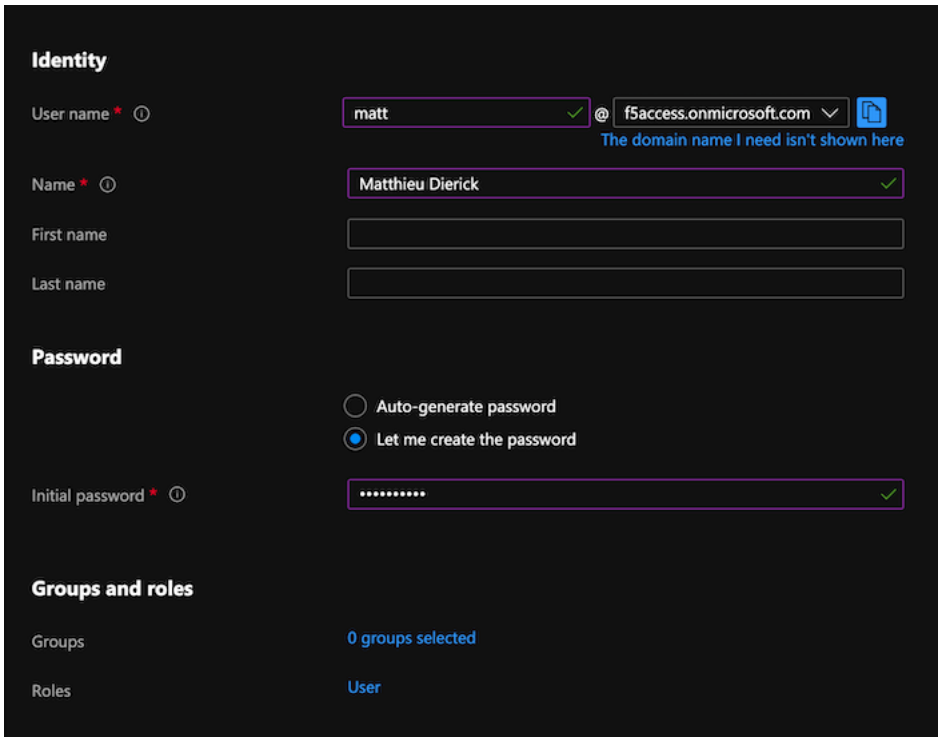
1. Connect to Azure Portal and select F5access tenant



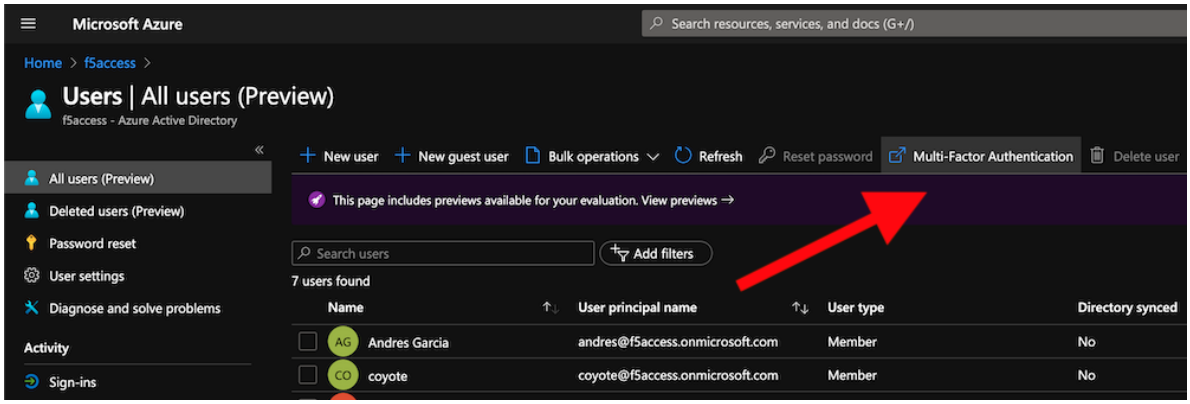
2. Go to `Azure Active Directory` > `Users`
3. Click `Create new`



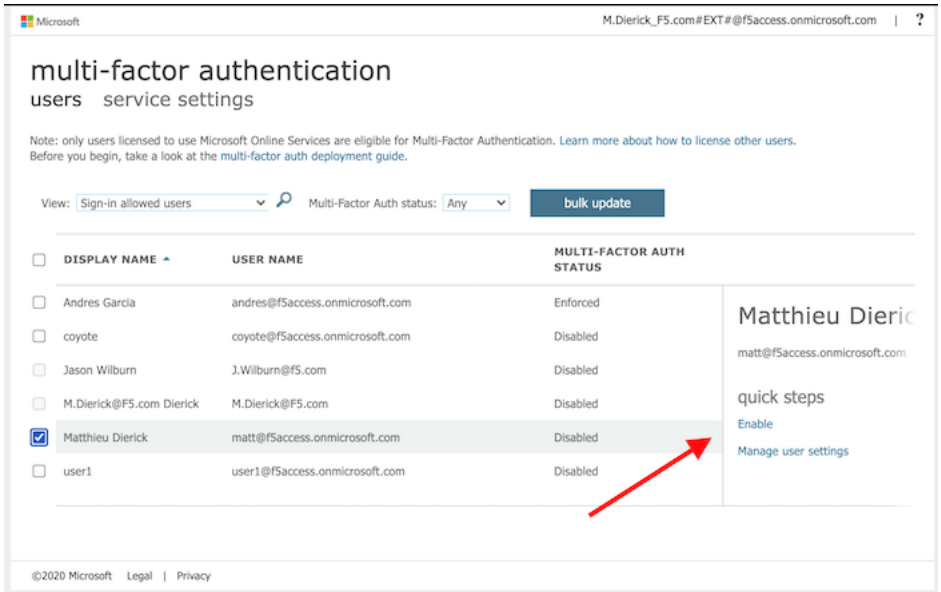
4. Enter the information, and click `Create`



5. Click on `Multi-Factor Authentication`



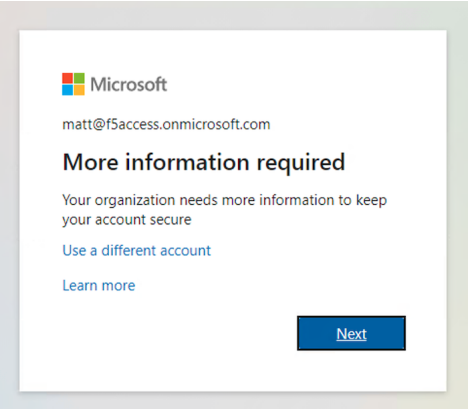
6. `Enable MFA` for the created user



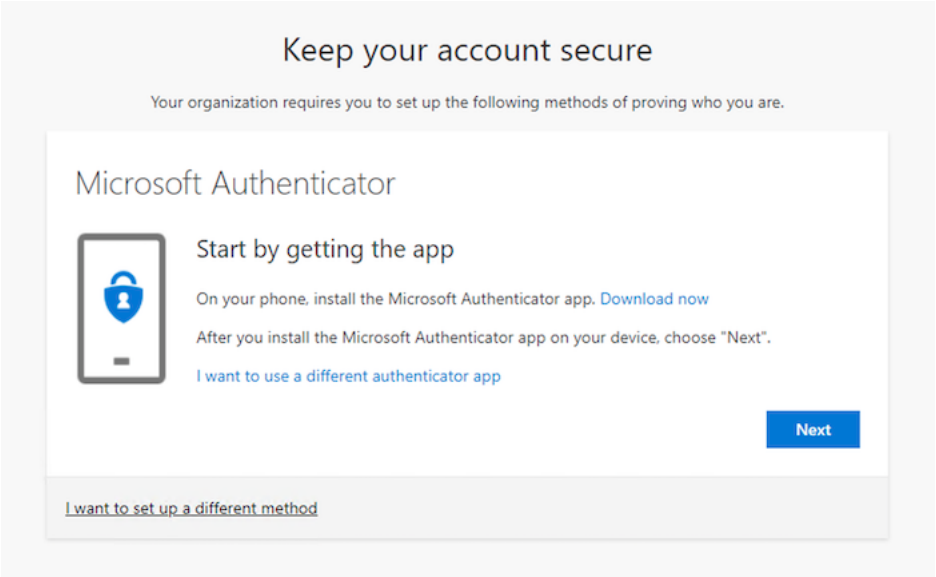
1.4.2 Test your deployment with MFA enabled

Warning: You should have received an email or teams chat from your SA/SME to continue.

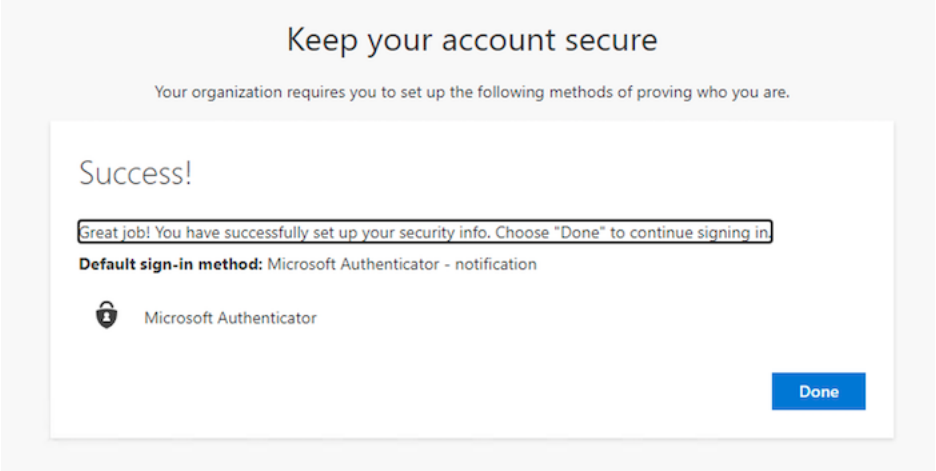
1. Close any opened browser and re-open `Microsoft Edge`
2. Connect to `Bluesky`. Don't try with `Vanilla` as your MFA test account does not exist in on-prem AAD. Thus, the SSo will not work. You can add this user in ADDS if you are confident with AD.
3. If you are not prompted at Azure AD login page, open an `incognito window`. It means you still have Azure AD cookies from previous session with ``user1``account.
4. At prompt, login with your MFA account. In my case, `matt@f5access.onmicrosoft.com` and the password provided by your SA/SME
5. You will be asked to enroll and select an MFA method



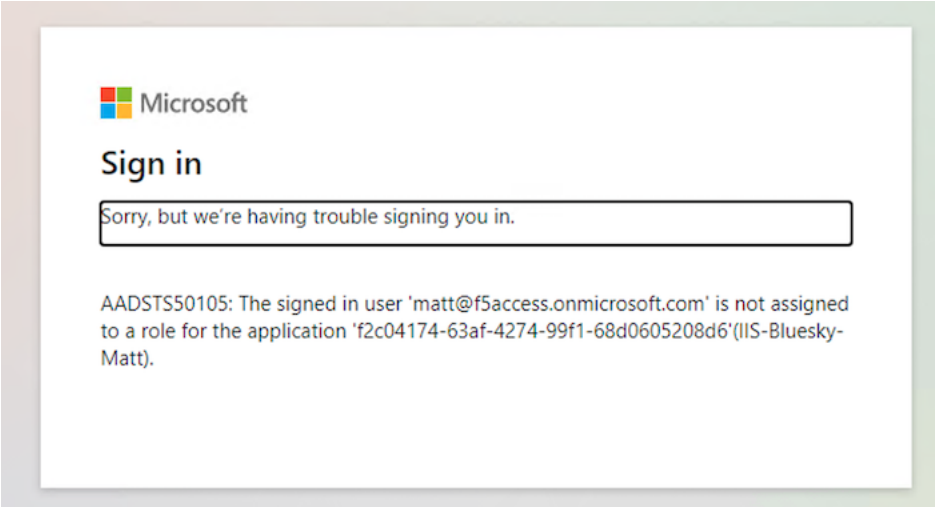
6. Click `Next`
7. You have the choice to use the `Microsoft Authenticator` mobile app, or use `SMS`. Make your choice and follow the step to enroll your device (or phone number)



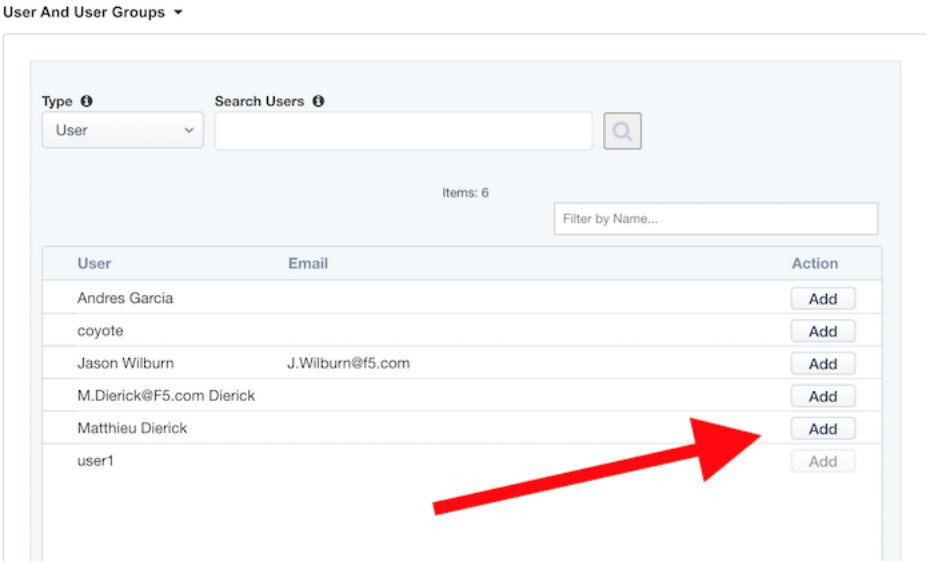
8. I select the `mobile app`, scan the `QR code`, and `approve` the push notification on my mobile phone.
9. I click `Next` and `Done`



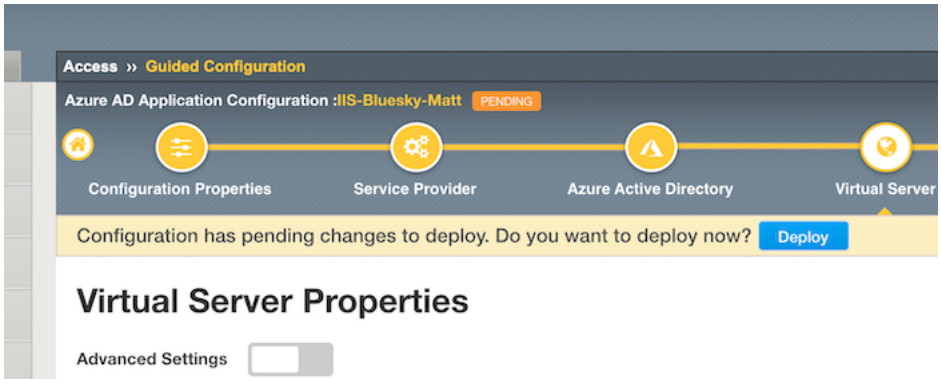
10. Azure AD asks you to `change your password` set by your SA/SME.
11. When done, and redirected to `Bluesky`, you can notice **it does not work**. The user has to be assigned with the `Bluesky` app.



12. In the BIG-IP, edit the `ISS-Bluesky-<my name>` template, and in `Azure Active Directory` step, add your account.



13. Click `Save and Next` and `Deploy`



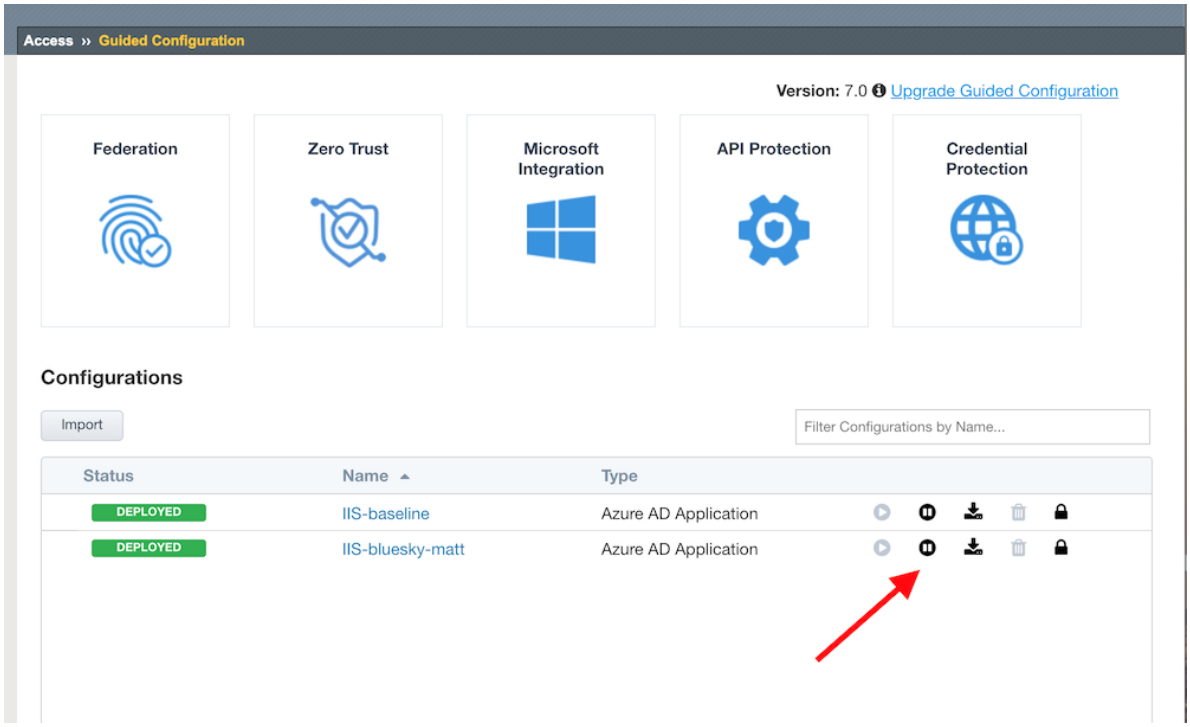
14. Make a new test, approve the `push notification` or enter the `OTP` received by SMS.

Note: This lab is not **Azure AD Conditional Access**. This is just **user MFA**. Conditional Access is similar but it is tied to a policy (group, location, app . . .). In this lab, `matt` will be prompted for MFA whatever the apps he connects to.

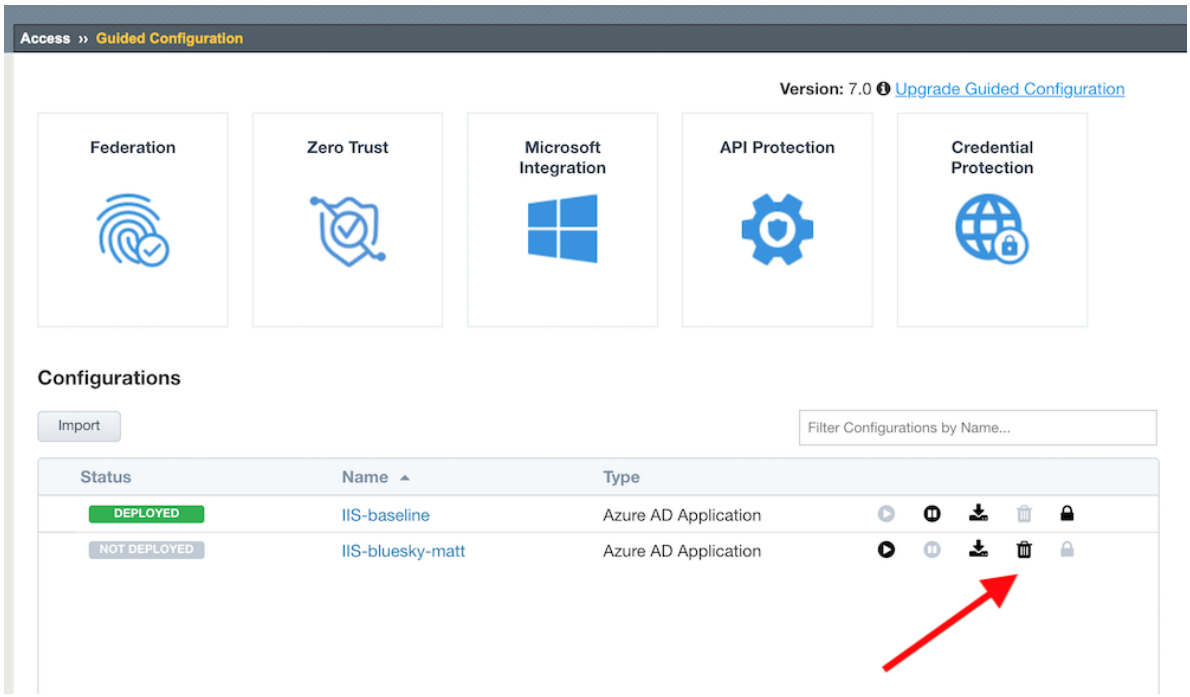
1.5 Class 5 - Clean up the lab

Warning: In order to keep the Azure AD tenant clean, it is important you delete your application in Guided Configuration, when your demo is finished.

1. In Guided Configuration menu, click on the `Undeploy` icon, then `OK`



2. When finished, click on `Delete` icon



Note: Thanks a lot, you cleaned up your config on both sides (APM and AAD). FYI, all old deployments will be

deleted automatically in Azure AD.