



# Click Studios

Passwordstate

Installation Instructions

# Table of Contents

1	SYSTEM REQUIREMENTS - GENERAL .....	3
2	INTERNET INFORMATION SERVICES (IIS) REQUIREMENTS .....	4
3	PASSWORD RESETS AND REMOTE SESSION LAUNCHER REQUIREMENTS.....	5
4	WHAT INFORMATION IS REQUIRED FOR THE INITIAL SETUP.....	6
5	SQL SERVER EXPRESS, AND SQL PORT NUMBER CONSIDERATIONS.....	7
6	CREATING AN APPROPRIATE DNS RECORD.....	8
7	INSTALLING PASSWORDSTATE .....	9
8	CONFIGURING PASSWORDSTATE FOR FIRST TIME USE.....	12
9	PASSWORDSTATE BACKUPS .....	18
10	ENCRYPTING THE DATABASE CONNECTION STRING IN THE WEB.CONFIG FILE .....	19
11	ENCRYPTING THE APPSETTINGS SECTION WITHIN THE WEB.CONFIG FILE.....	20
12	SSL CERTIFICATE CONSIDERATIONS.....	21
13	SINGLE SIGN-ON WITH ACTIVE DIRECTORY ACCOUNTS .....	23
14	CONFIGURE PASSWORDSTATE TO USE A MANAGED SERVICE ACCOUNT (MSA) TO CONNECT TO THE DATABASE.....	25
15	X-FORWARDED-FOR SUPPORT .....	30
16	TROUBLESHOOTING CONNECTIVITY ISSUES .....	31
17	MCAFEE AND CONSTANT LOGOUT ISSUES.....	32


# 1 System Requirements - General

Passwordstate has the following system requirements:

## Web Server

Your web server which will host the Passwordstate web site can be any of the following Operating System versions, with required components:

- Microsoft Windows Server 2008 R2 & IIS 7.5
- Microsoft Windows Server 2012 & IIS 8.0
- Microsoft Windows Server 2012 R2 & IIS 8.5
- Microsoft Windows Server 2016 & IIS 10.0
- Microsoft Windows Server 2019 & IIS 10.0
- Windows 7 & IIS 7.5
- Windows 8 & IIS 8.0
- Windows 10 & IIS 10.0
- Microsoft SQL Server 2012 Native Client
- .NET Framework 4.5
- PowerShell 4.0 or above
- Oracle JRE 8 or above (if using Browser based Remote Session Launcher)

 Note: It is not recommended or supported to install Passwordstate on a Domain Controller.

## Database Server

You will need to have one of the following supported SQL Server versions installed prior to installing Passwordstate, so Passwordstate can connect to SQL Server and create a database. SQL Server can be installed either on the same web server as Passwordstate, or on any other Windows Server in your environment.

- Microsoft SQL Server 2012
- Microsoft SQL Server 2012 Express
- Microsoft SQL Server 2014
- Microsoft SQL Server 2014 Express
- Microsoft SQL Server 2016
- Microsoft SQL Server 2016 Express
- Microsoft SQL Server 2017
- Microsoft SQL Server 2017 Express

**Note:** If you would like to use the High Availability module of Passwordstate, your distribution and publication databases must reside on SQL Server Standard or above – SQL Express can only act as a subscriber to SQL Server replication.

**Important:** SQL Server must be configured for mixed-mode authentication, so the Passwordstate web site can connect to SQL Server using an SQL Account. **Active Directory Accounts cannot be used to authenticate against the database.**

If you are unsure of how to install SQL Server, the Passwordstate.zip file contains some instructions for installing SQL Server 2016 Express edition.

## Email Server

If you would like to receive emails generated from Passwordstate, you must also have an email server which is capable of sending anonymous SMTP emails, or emails from an authenticated mailbox

## 2 Internet Information Services (IIS) Requirements

When installing Internet Information Services, the following component/roles are required as a minimum. If these IIS roles are not installed, Passwordstate will install them for you.

### Common HTTP Features

- Static Content
- Default Document
- HTTP Errors

### Application Development

- ASP.NET (or ASP.NET 4.5 on Server 2012 and Windows 8)
- .NET Extensibility (or .NET Extensibility 4.5 on Server 2012 and Windows 8)
- ISAPI Extensions
- ISAPI Filters

### Security

- Windows Authentication
- Request Filtering

### Performance

- Static Content Compression



Note: Authentication to the Passwordstate web site can be integrated with your Active Directory domain, or you can use the Forms-Based Authentication which doesn't rely on Active Directory at all. During the initial install of Passwordstate, you will be asked which authentication option you would like to use.

### 3 Password Resets and Remote Session Launcher Requirements

#### **Password Discovery, Reset and Validation Requirements**

In Passwordstate, through the use of PowerShell scripts, you're able to reset passwords on many different remote systems and hosts.

Please refer to the document 'Password Discovery Reset & Validation Requirements.pdf' for the various system requirements required to use this functionality.

#### **Passwordstate Remote Session Launcher Requirements**

The Passwordstate Remote Session Launcher allows you to perform RDP, SSH, Telnet, VNC or TeamViewer remote session connections directly from the Passwordstate web site, without having to manually enter any authentication credentials.

To use this feature, please refer to the document 'Remote Session Launcher Installation Instructions.pdf' for System Requirements and installation instructions.

## 4 What Information is required for the Initial Setup

Prior to installing Passwordstate and running through the initial Setup Wizard, you will require the following information:

### Let Passwordstate Create its Own Database

- An SQL Account (not an Active Directory account) with sufficient permissions to create the database – at a minimum the 'dbcreator' and 'securityadmin' SQL Server roles are required (The 'sa' account has these privileges, although some DBA's do not like to use this account due to its elevated privileges).

During the initial setup, the following will occur:

- a. The Passwordstate database will be created and populated with some base data
- b. A SQL Account called 'passwordstate\_user' will be created, and will be given db\_owner rights to the Passwordstate database only

### Create Your Own Database, and Let Passwordstate Connect to it

- You will need to have created the empty database, and an SQL Account for Passwordstate to connect to this empty database. The SQL Account requires db\_owner rights to the Passwordstate database only

### Additional Setup Information

- Your **Registration Key** details for Passwordstate
- **Host Name** and **Port Number** of an **email server** capable of sending anonymous SMTP mail, or from an authenticated mailbox
- **SMTP Address** from which Passwordstate will send the emails from
- **Proxy Server Details** – Passwordstate can periodically check for the updates, and if your organization requires all internet access to go through a proxy server, you will need to specify the proxy host name and port number during the installation (this feature can also be disabled once you're using Passwordstate if required).

## 5 SQL Server Express, and SQL Port Number Considerations

If you intend to use SQL Server Express to host your Passwordstate database, please consider the following before installing Passwordstate:

1. If you're using SQL Server Express on a different server to where you installed Passwordstate, you may need to check if the TCP/IP Protocol is enabled (use SQL Server Configuration Manager -> SQL Server Network Configuration), and also the Windows Service 'SQL Server Browser' is set to 'Automatic' Startup Type and has been started. You will need to restart SQL Server Express after changing these settings
2. By default, SQL Server Express installs with an 'instance' name of SQLEXPRESS. When you're configuring Passwordstate for first time use, specifically the 'Database Settings' page, please ensure you have specified the name of the instance correctly i.e. fill out both the Database Server Name and Instance Name fields
3. If you intend to also install the High Availability instance of Passwordstate, SQL Server Express can only be used as the Subscriber for data replication, not the Publisher or Distribution database.

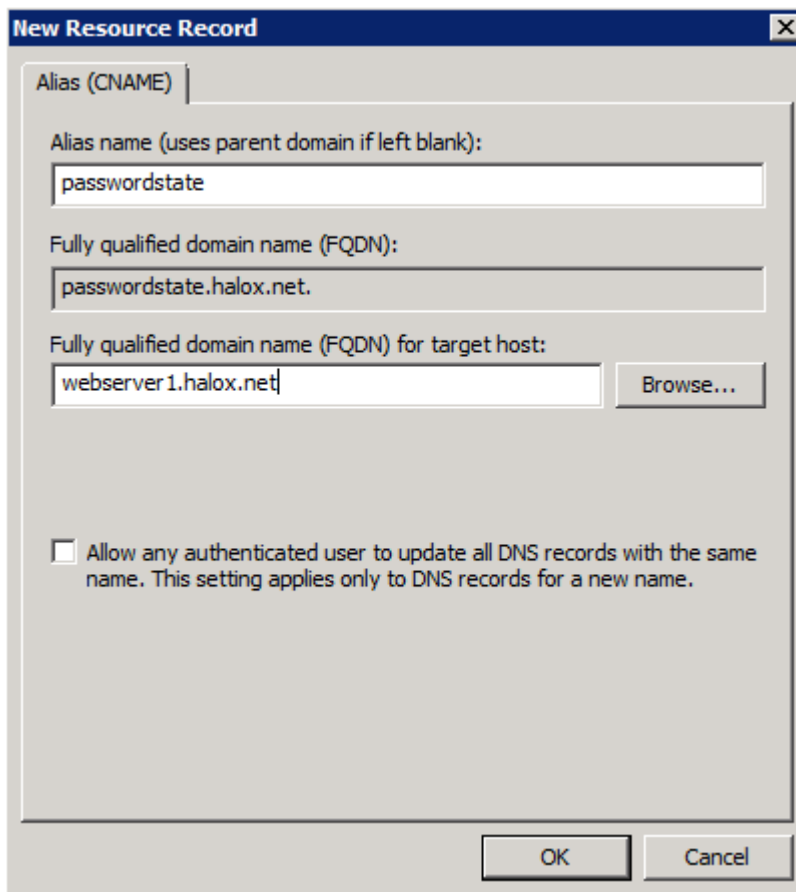
If you are running SQL Server on a non-standard port number, you will need to append the port number to the end of the Database Server Name during '9. Configuring Passwordstate for First Time Use' in the following way: ServerHostName,PortNumber i.e. sqlserver1,8484

## 6 Creating an Appropriate DNS Record

During the installation of Passwordstate, you have the option of using a URL which has the host name of the web server in it, or you can specify your own custom URL e.g. <https://passwordstate>

If you want to use your own custom URL, you will need to create a CNAME DNS entry as per the following instructions (please do not use host files for name resolution, as they do not work with Windows Authentication in IIS):

1. On your server hosting DNS, start 'DNS Manager'
2. Right click on the appropriate domain, and select 'New Alias (CNAME)'
3. As per the following screenshot, specify the name of your web server host name in the 'Fully qualified domain name (FQDN) for target host' text box, then click on the 'OK' button



The screenshot shows a 'New Resource Record' dialog box with the following fields and options:

- Alias (CNAME)**: A tabbed section at the top.
- Alias name (uses parent domain if left blank):** A text box containing 'passwordstate'.
- Fully qualified domain name (FQDN):** A text box containing 'passwordstate.halox.net'.
- Fully qualified domain name (FQDN) for target host:** A text box containing 'webserver1.halox.net' and a 'Browse...' button.
- Allow any authenticated user to update all DNS records with the same name. This setting applies only to DNS records for a new name.**
- Buttons:** 'OK' and 'Cancel' at the bottom.



## 7 Installing Passwordstate

To install Passwordstate, run 'Passwordstate.exe' and follow these instructions:

1. At the 'Passwordstate Installation Wizard' screen, click on the 'Next' button

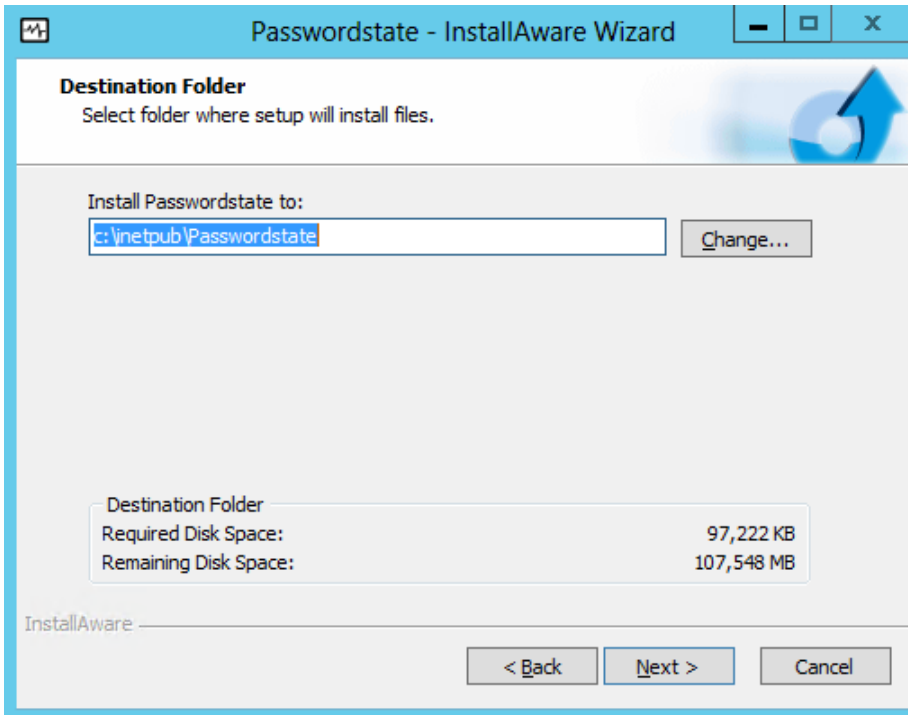


2. At the 'License Agreement' screen, tick the option 'I accept the terms in the License Agreement', then click on the 'Next' button

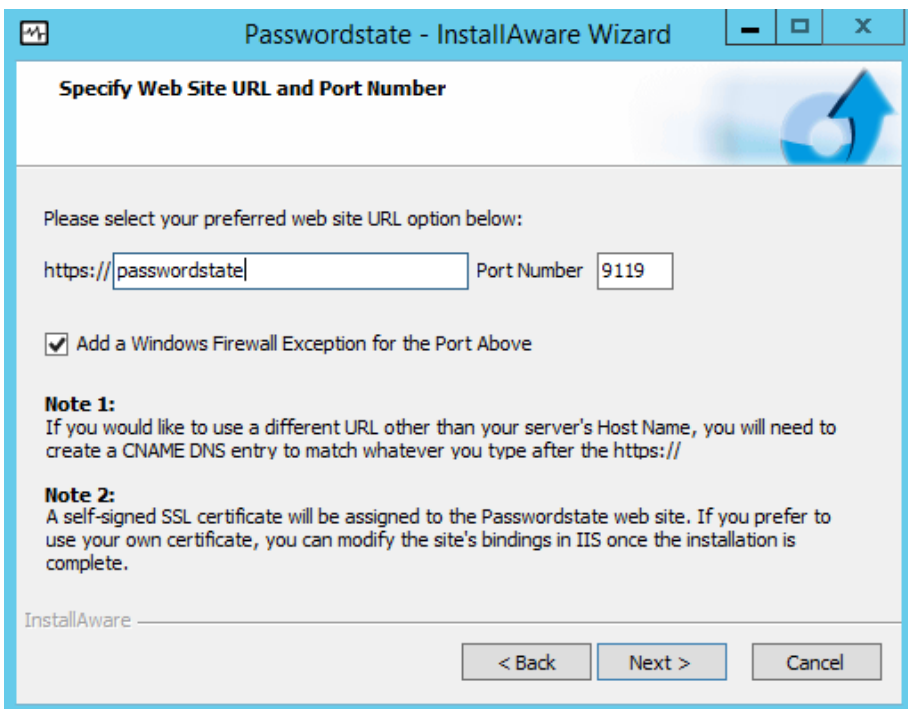


3. At the 'Destination Folder' screen, you can either accept the default path or change to a different

location, then click on the 'Next' button



4. At the 'Specify Web Site URL and Port Number' screen, specify the URL you would like to use, then click on the 'Next' button



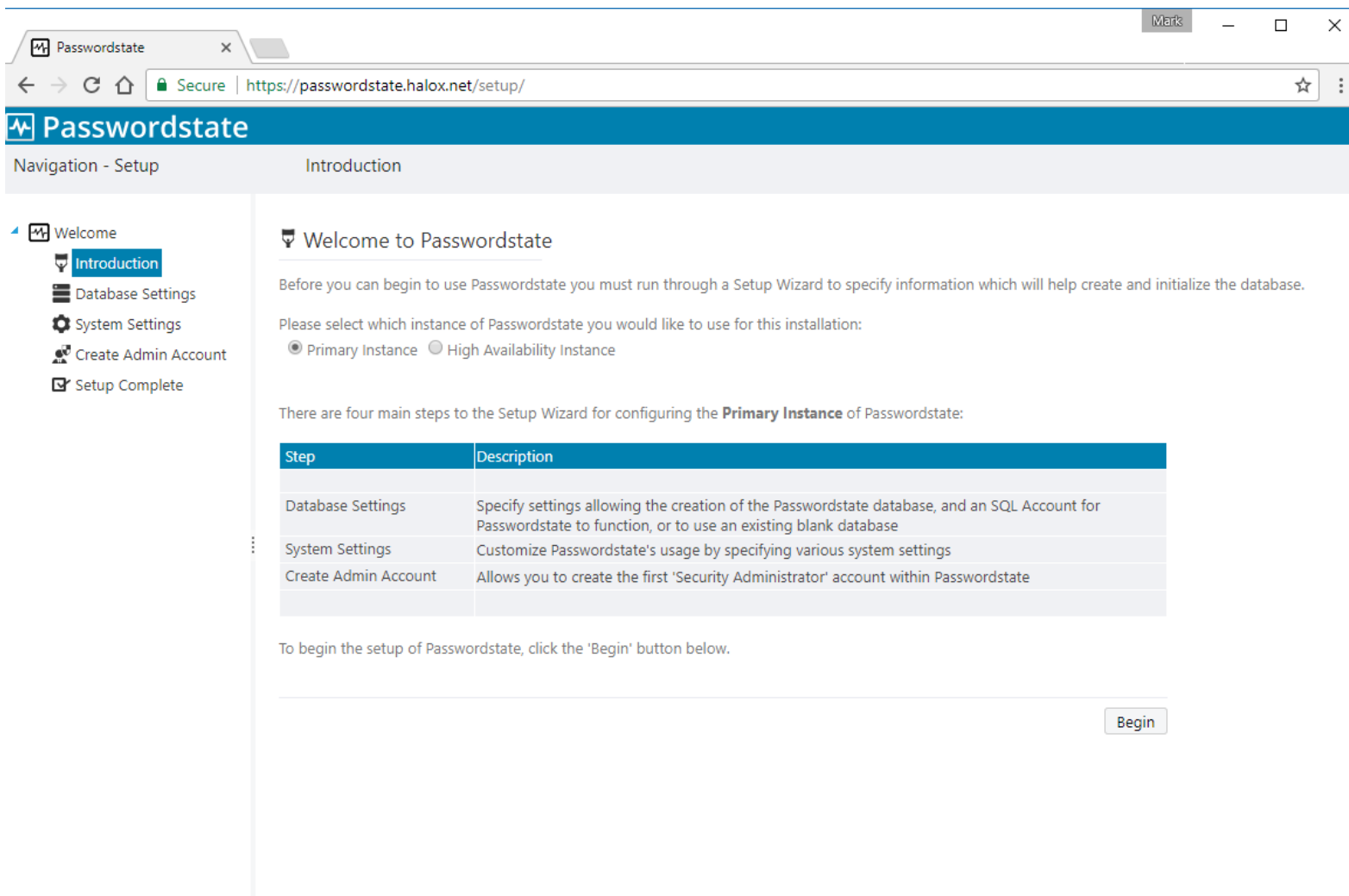
- At the 'Completing the InstallAware Wizard for Passwordstate' screen, click on the 'Next' button



- Once installed, click on the 'Finish' button
- If you have a Firewall enabled on your web server, you may need to open up the port number you specified during the install (default is 9119), so that users are able to access the web site

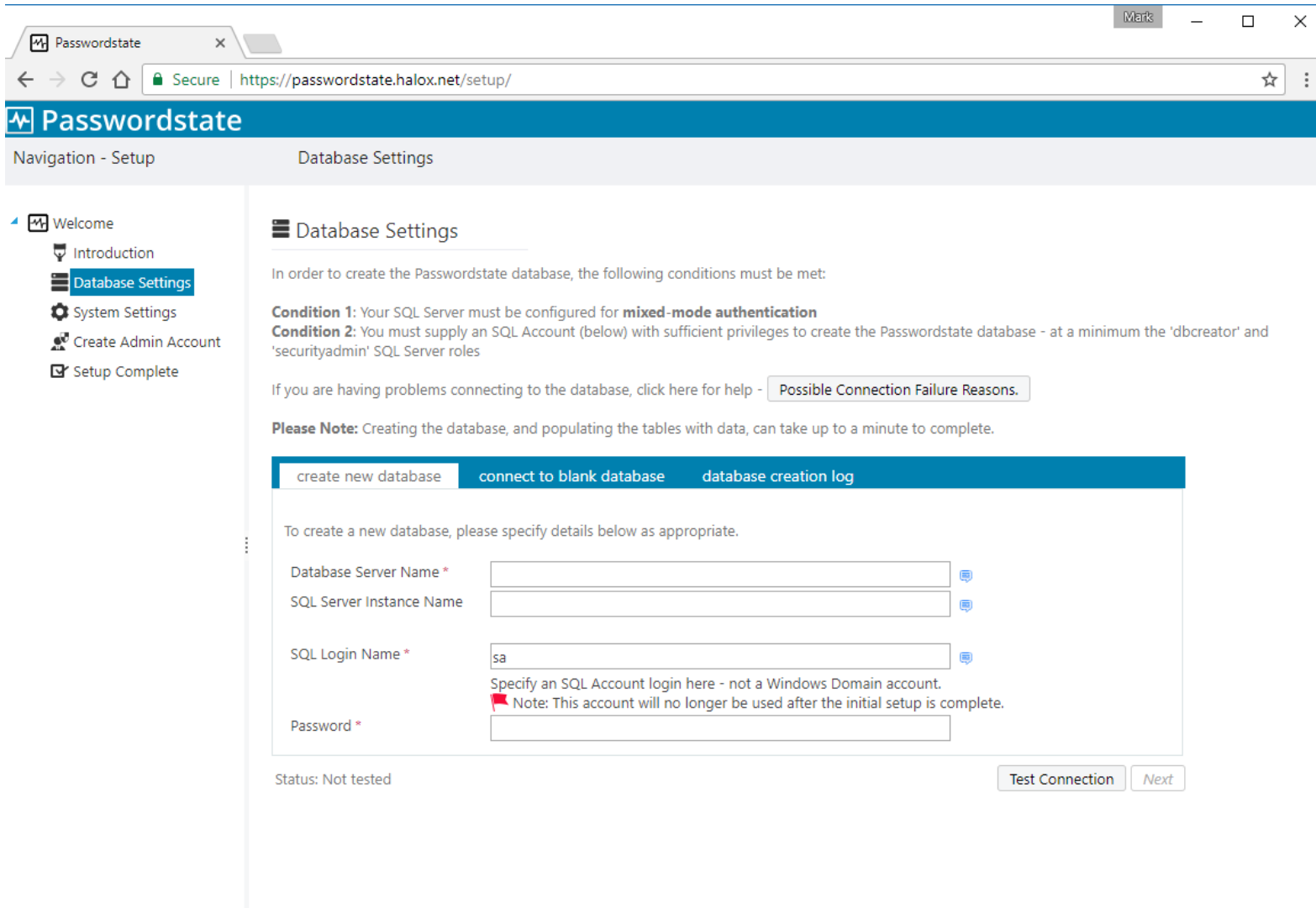
## 8 Configuring Passwordstate for First Time Use

**Introduction** - Now that Passwordstate is installed, you can direct your browser to the URL you specified during the initial install, and follow the initial Setup Wizard – this wizard will guide you through a series of questions for configuring Passwordstate for use.



**Database Settings – Create New Database** - On this screen you will need to specify database settings for creating the Passwordstate database. Please use the onscreen instructions if you have any issues connecting to the database.

**Please Note:** Creating the database, and populating the tables with data, could take up to a minute to complete.



**Database Settings – Connect to Blank Database** – If you prefer to create the blank Passwordstate database yourself prior to tables being created and populated with data, you can do so by clicking on the ‘Connect to Blank Database’ tab first.

**Please Note:** You must first create a blank database to connect to, and an appropriate SQL Account which has db\_owner rights to this database. If connecting to a Microsoft Azure or Amazon AWS database, please refer to their documentation for how to create the database and SQL Account.

Passwordstate

Navigation - Setup Database Settings

Welcome

- Introduction
- Database Settings
- System Settings
- Create Admin Account
- Setup Complete

### Database Settings

In order to create the Passwordstate database, the following conditions must be met:

**Condition 1:** Your SQL Server must be configured for **mixed-mode authentication**

**Condition 2:** You must supply an SQL Account (below) with sufficient privileges to create the Passwordstate database - at a minimum the 'dbcreator' and 'securityadmin' SQL Server roles

If you are having problems connecting to the database, click here for help - [Possible Connection Failure Reasons.](#)

**Please Note:** Creating the database, and populating the tables with data, can take up to a minute to complete.

create new database connect to blank database database creation log

To connect to a blank database you have manually created yourself, please specify details below as appropriate.

**Note:** You must have also created the SQL Login Name below yourself, and this account requires db\_owner rights to the Passwordstate database only.

Database Location \*  Internal  Microsoft Azure  Amazon RDS

Database Server Name \*

SQL Server Instance Name

Database Name \*

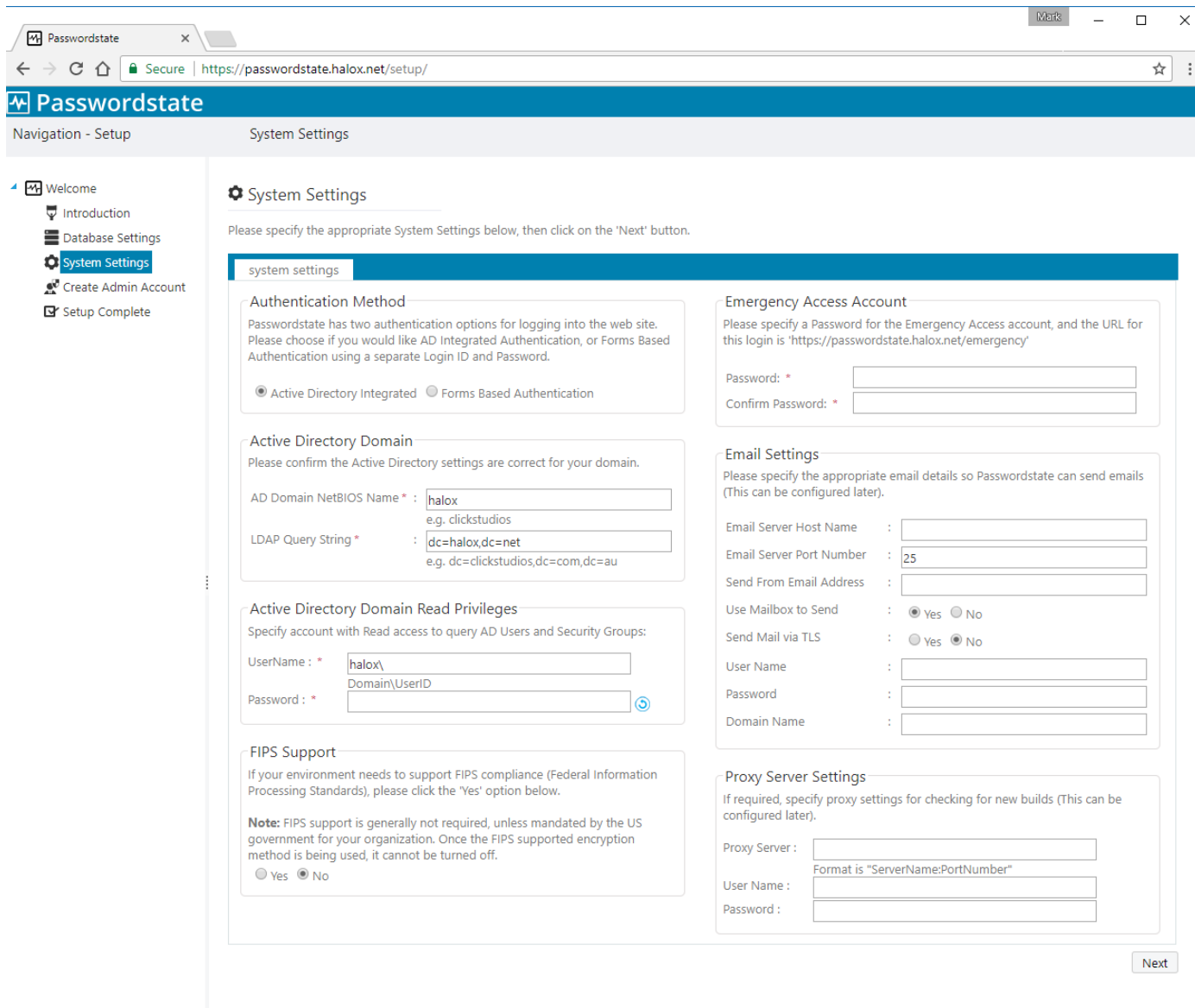
SQL Login Name \*

Password \*

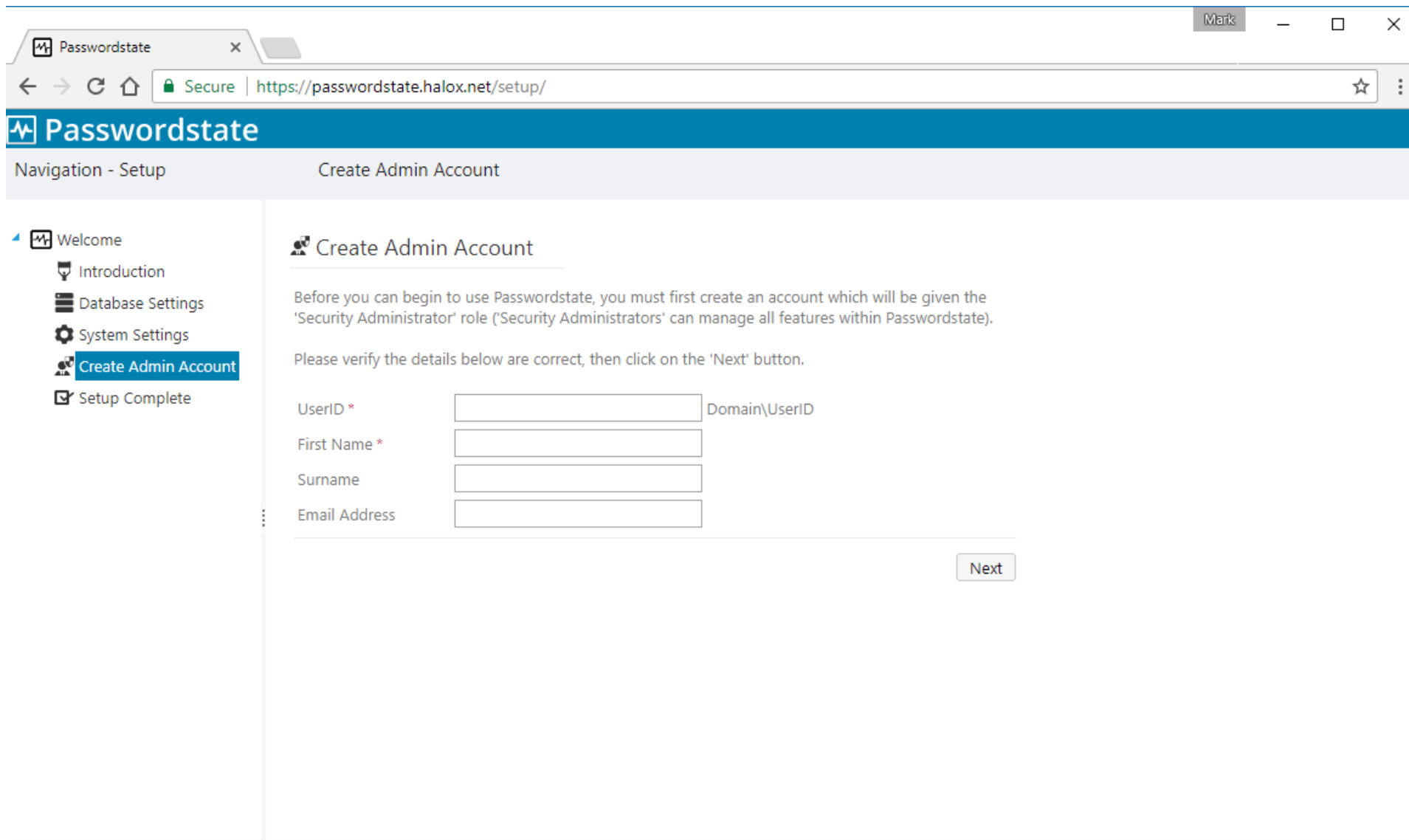
Specify an SQL Account login here - not a Windows Domain account.

Status: Not tested [Test Connection](#) [Next](#)

**System Settings** – On this screen you specify various system wide settings for Passwordstate usage. Explanation for each of these settings is detailed after this screenshot.



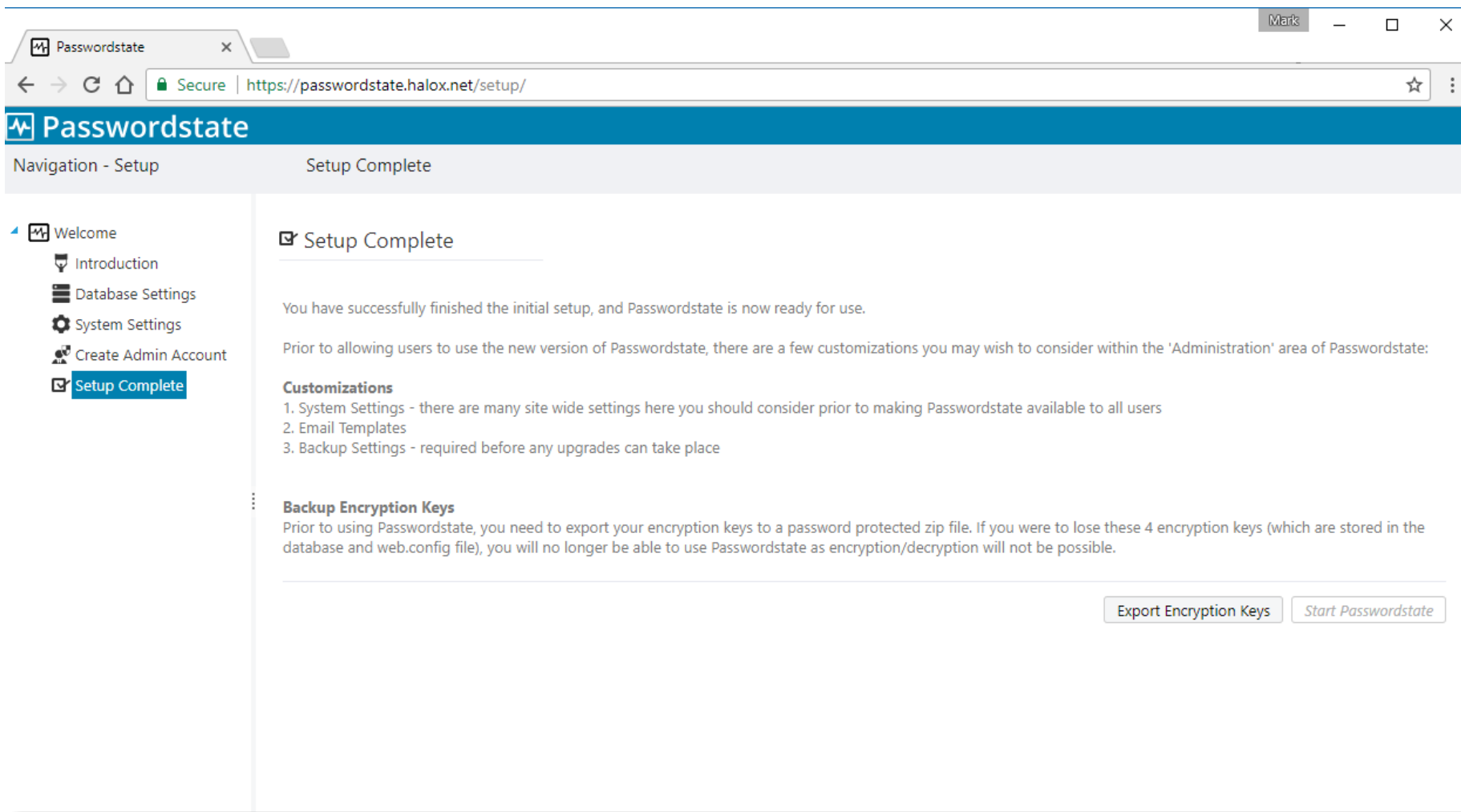
**Create Admin Account** – On this screen you specify details for the first user account to be created in Passwordstate. This account will be granted Security Administrator privileges, and assign all Security Administrator roles.





**Setup Complete** – The installation is now complete and you can begin using Passwordstate. Prior to granting access, or informing users of the new version, you may wish to review some of the system wide settings found under the ‘Administration’ area of Passwordstate.

**Export Encryption Keys** – It is very important you export your encryption keys for safe storage outside of Passwordstate. If you were to lose your web.config file in a disaster, Click Studios would not be able to help you rebuild your Passwordstate environment. The split encryptions keys are stored in the web.config file, and within the database.

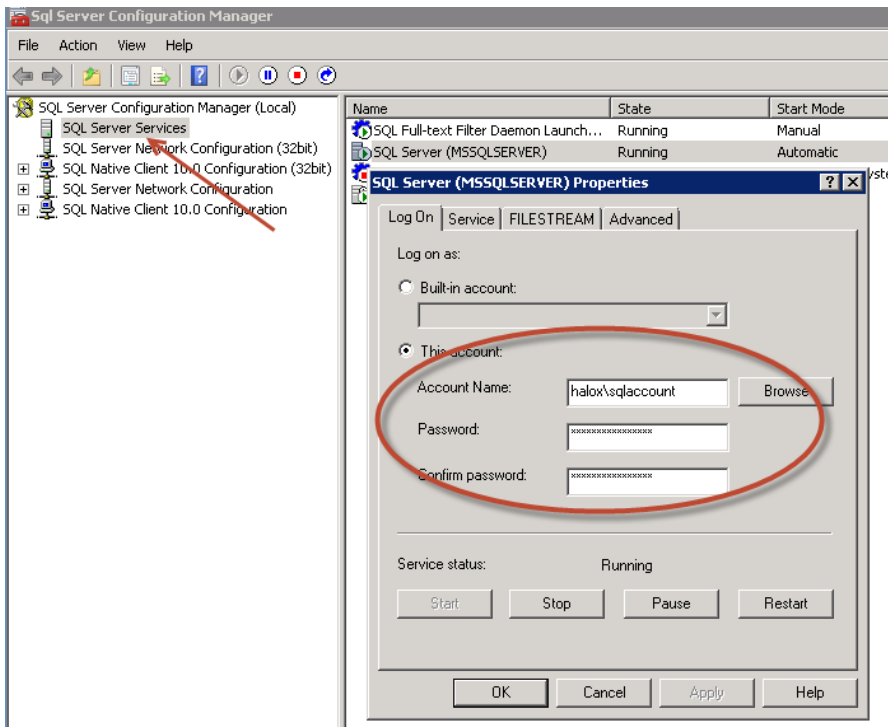


## 9 Passwordstate Backups

To allow backups to work through the Passwordstate web interface, you will need to specify an account (domain or Windows account), which has the following permissions:

- Permissions to write to the Backup path you've specified
- Permissions to stop and start the Passwordstate Windows Service on the web server
- Permissions to write to the Passwordstate folder.

In addition to this, you must configure the SQL Server service to use a domain or Windows account which has permissions to also write to the Backup Path. To do this, you need to open the 'SQL Server Configuration Manager' utility on your database server, click on 'SQL Server Services', and then specify and account as per the next screenshot:



1. Now you can navigate to the page Administration -> Backups & Upgrades
2. Click on the 'Backup & Upgrade Settings' button
3. Using the Windows/Domain account mentioned above, configure the options on the screen and click on the 'Test Permissions' button. If the Test Permissions is successful, you can return to the previous screen and run a manual backup by clicking on the 'Backup Now' button.

## 10 Encrypting the Database Connection String in the Web.config file

Whilst it's not entirely necessary to encrypt the database connection strings within the web.config file, it is recommended so the SQL Account credentials used to access the Passwordstate database is encrypted and unreadable from anyone who can read the file system on your web server.

To encrypt the database connections string, please follow these instructions:

### Encrypt Connection String

- Open a command prompt and type CD C:\Windows\Microsoft.NET\Framework64\v4.0.30319
- Type the following:
  - aspnet\_regiis.exe -pef "connectionStrings" "c:\inetpub\passwordstate" (change the path if you've installed Passwordstate to a different location)
- Then restart the Passwordstate Windows Service

### Decrypt Connection String

- Open a command prompt and type CD C:\Windows\Microsoft.NET\Framework64\v4.0.30319
- Type the following:
  - aspnet\_regiis.exe -pdf "connectionStrings" "c:\inetpub\passwordstate" (change the path if you've installed Passwordstate to a different location)
- Then restart the Passwordstate Windows Service

**Note 1:** If you intend to rename your server host name, or move your Passwordstate install to a different server, you should decrypt these settings first.

**Note 2:** If you do not wish to use an SQL Account to connect to your database server, please refer to the section below in this document titled 'Configure Passwordstate to use a Managed Service Account (MSA) to connect to the database'.

## 11 Encrypting the appSettings Section within the Web.config file

It is also not entirely necessary to encrypt the appSettings section within the web.config file, but as this section of the file stores half of your split encryption keys, it is recommended for added security.

To encrypt the appSettings section, please follow these instructions:

### Encrypt appSettings Section

- Open a command prompt and type `CD C:\Windows\Microsoft.NET\Framework64\v4.0.30319`
- Type the following:
  - `aspnet_regiis.exe -pef "appSettings" "c:\inetpub\passwordstate"` (change the path if you've installed Passwordstate to a different location)
- Then restart the Passwordstate Windows Service

### Decrypt appSettings Section

- Open a command prompt and type `CD C:\Windows\Microsoft.NET\Framework64\v4.0.30319`
- Type the following:
  - `aspnet_regiis.exe -pdf "appSettings" "c:\inetpub\passwordstate"` (change the path if you've installed Passwordstate to a different location)
- Then restart the Passwordstate Windows Service

**Note:** If you intend to rename your server host name, or move your Passwordstate install to a different server, you should decrypt these settings first.

## 12 SSL Certificate Considerations

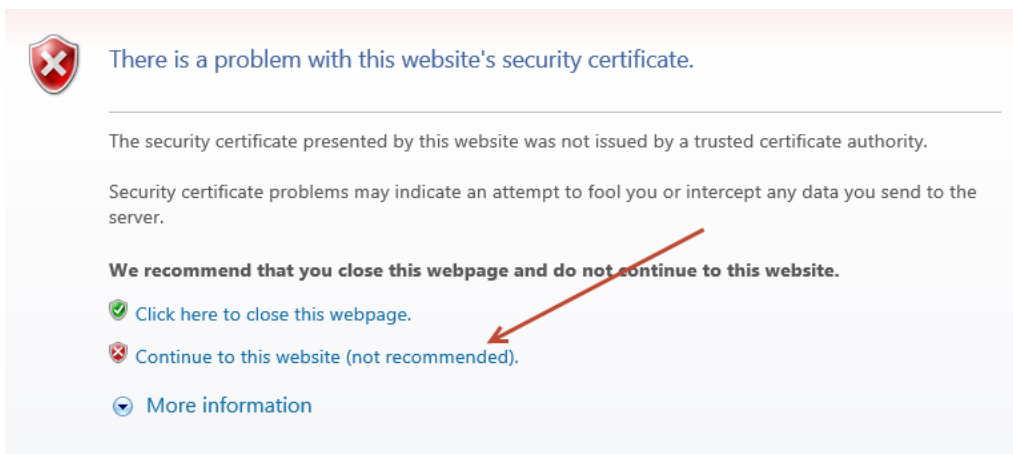
The installer for Passwordstate installs a self-signed SSL certificate on your web server, and binds it to the Passwordstate web site.

If you have your own SSL certificate installed on the web server you'd prefer to use, you can modify the bindings for the site in IIS, and select the appropriate certificate.

If you wish to continue using the self-signed SSL certificate, then you may want to instruct your users to "Install" the certificate on their computer, so the various Internet browsers don't complain about the certificate not being issued by a trusted authority.

To install the certificate, you can follow these steps:

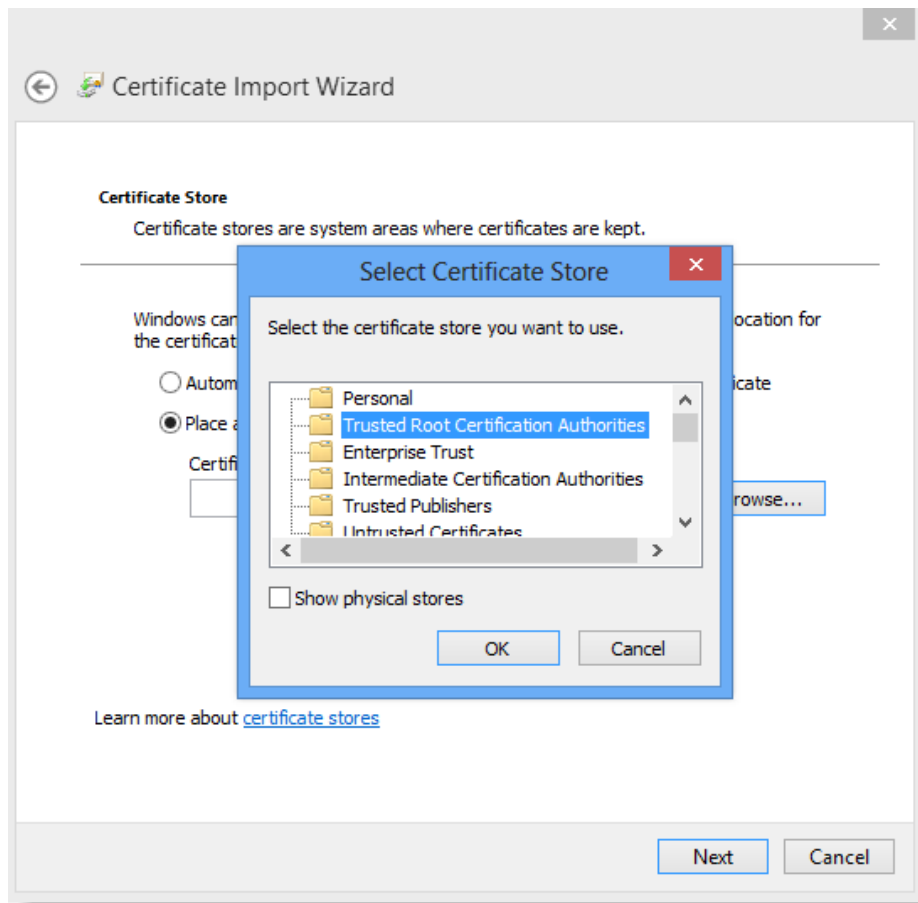
1. Using Internet Explorer, browser to the Passwordstate web site
2. When you see the following screen, click on the 'Continue to this website' link



3. Now click on the 'Certificate error' link at the top of your screen



4. The click on 'View Certificates', then on the 'Install Certificate...' button
5. Select the 'Local Machine' Store Location, then click on the 'Next' button
6. Select 'Place all certificates in the following store' option, click on the 'Browse' button, and select 'Trusted Root Certification Authorities' as per the next screenshot

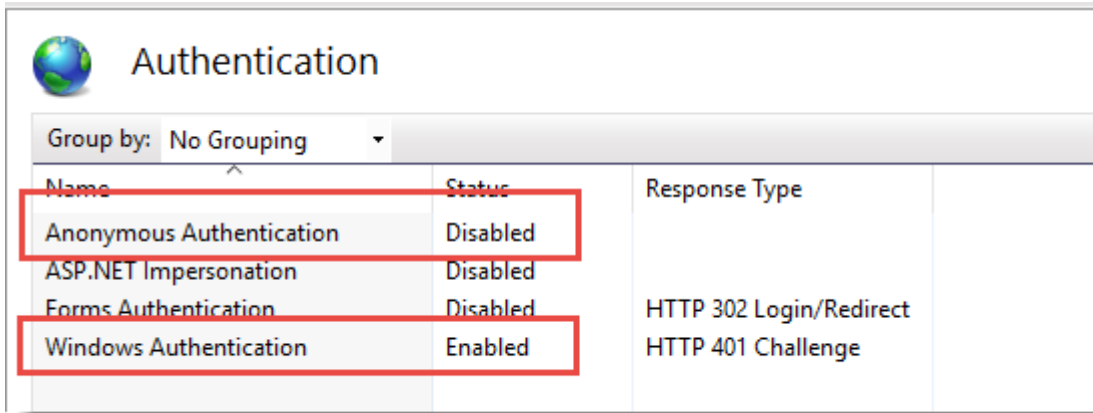


7. Now click on the 'OK' button, then the 'Next' and 'Finish' buttons
8. After the certificate is installed, you can close and re-open your browser to the Passwordstate web site, and it should no longer complain about an untrusted certificate

### 13 Single Sign-On with Active Directory Accounts

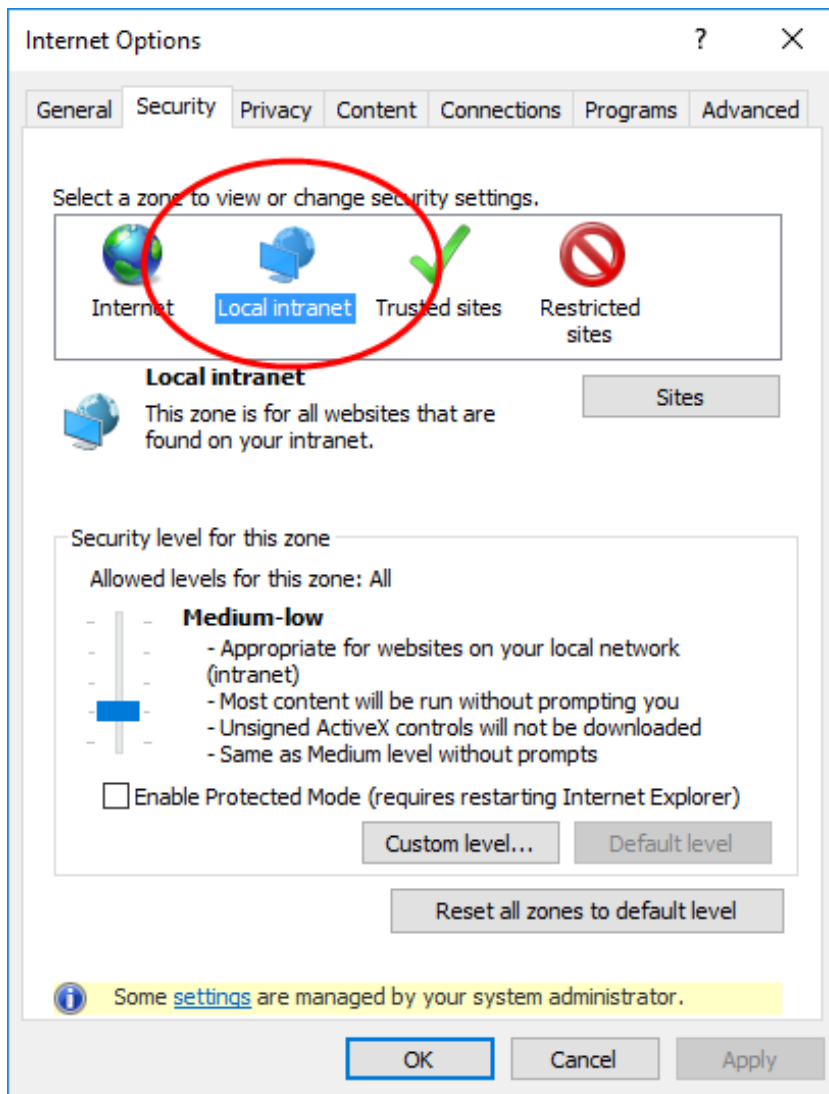
If you choose the 'Active Directory Integrated' version of Passwordstate, it is also possible to configure Internet Information Services to allow single sign on for authentication.

To do this, simply disable 'Anonymous Authentication' for the site in IIS, like in the screenshot below. Please note that when doing this, it may cause issues authentication from Mac and Linux desktops.



If after enabling single-sign on your browser prompts you for your domain credentials, then below is the most common cause of this.

If using Internet Explorer or Chrome, check the Passwordstate web site is being detected in the 'Local Intranet' security zone in Internet Explorer, and the option for 'User Authentication' is set to 'Automatic logon only in Intranet zone'. **You may need to add the URL of the site to a group policy which forces Internet Explorer to detect the site is in the intranet zone. Alternatively, each user can add this manually in Internet Explorer via the Internet Options -> Security Tab. Below is a screenshot of this setting.**





- If using Firefox, it does this by design. To fix this, you can install a Firefox extension called **Integrated Authentication for Firefox™**. Now in your Firefox browser click **Tools** -> **Integrated Authentication Sites** -> Enter in your passwordstate URL - ensure there is no backslash on the end - eg <https://passwordstate.halox.net>



## 14 Configure Passwordstate to use a Managed Service Account (MSA) to connect to the database

As of Build 7301, it is possible to configure Passwordstate to use a Managed Service Account to communicate with the database server, instead of a SQL Login Account. Below are the following steps required in order to configure support for this.

-  Note 1: If you are wanting to do Password Resets and Account Heartbeat validations across non-trusted domains, then you cannot use a MSA account for database connectivity – the Application Pools in IIS and the Passwordstate Windows Service executes the PowerShell scripts for these features, initiating connections to the remote hosts. If there are no domain trusts in place, this will cause issues as the MSA account makes the connection to the remote host.
-  Note 2: The Windows Integrated API cannot be used in a standard fashion when also using an MSA account for database connectivity, due the way “impersonation” works with the Windows API. If you are wanting to use the API in this scenario, then you need to give each user who will be executing an API Script direct access to the Passwordstate database in SQL Server i.e. db\_owner rights for the user’s Active Directory Domain account.

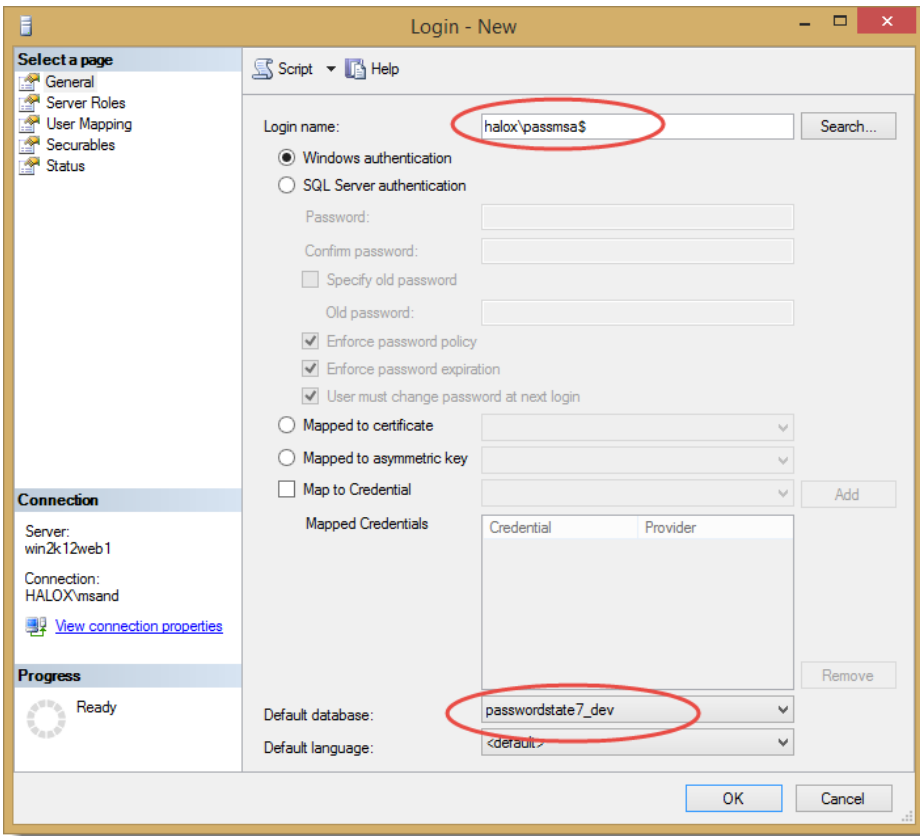
### Create a Managed Service Account (MSA)

- On your domain controller, open PowerShell console as an Admin, and execute the following commands
  - `New-ADServiceAccount -Name <MSAAccountName> -RestrictToSingleComputer -AccountPassword (ConvertTo-SecureString -AsPlainText "<password>" -Force) -Path "cn=<MyCN>,dc=<MyDC>,dc=<MyDC>"` (replace the variables in <> as appropriate)
  - `Add-ADComputerServiceAccount -Identity "<MyWebServerName>" -ServiceAccount "<MSAAccountName>"` (The Web Server Name is where the MSA Account will be used)
- On your Passwordstate Web Server, open PowerShell console as Admin, and execute the following commands:
  - `Add-WindowsFeature RSAT-AD-PowerShell` (this role may already be installed)
  - `Import-Module ActiveDirectory`
  - `Install-ADServiceAccount -Identity <MSAAccountName>`

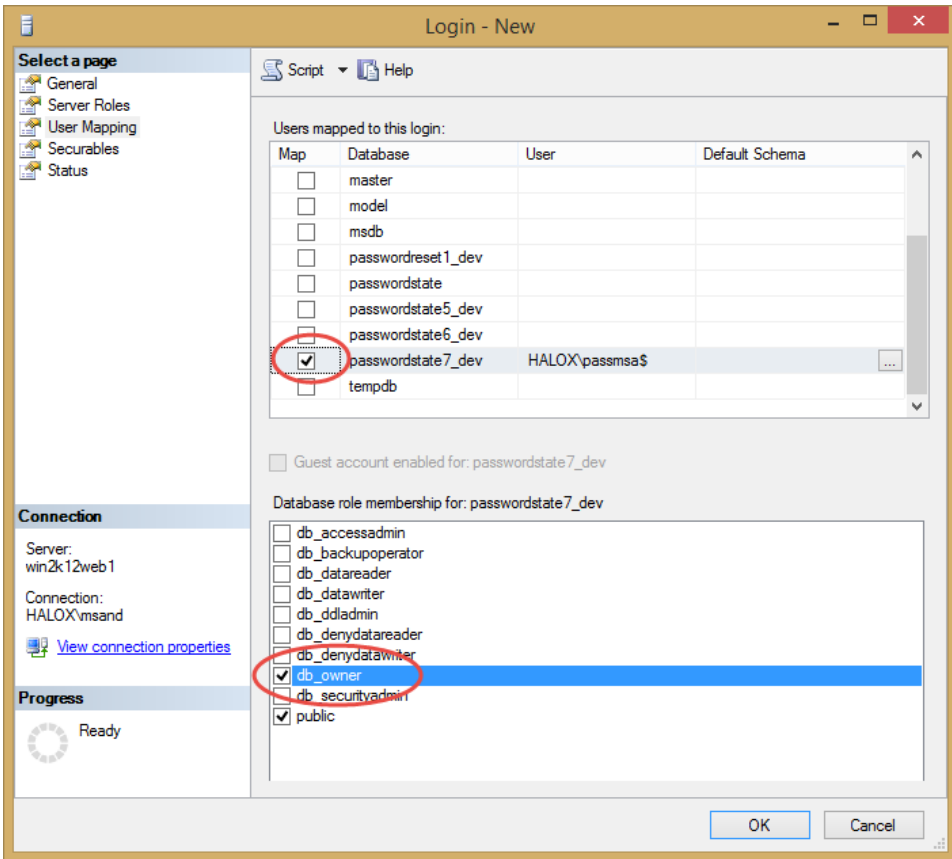
### MSA Account and SQL Server

You now need to add a new Windows login within your SQL Server, and you can use the screenshots below as a guide – in our example, the MSA account is called passmsa, and whenever referencing an MSA account you must append the \$ symbol to the end.

1. Create the MSA Login Account

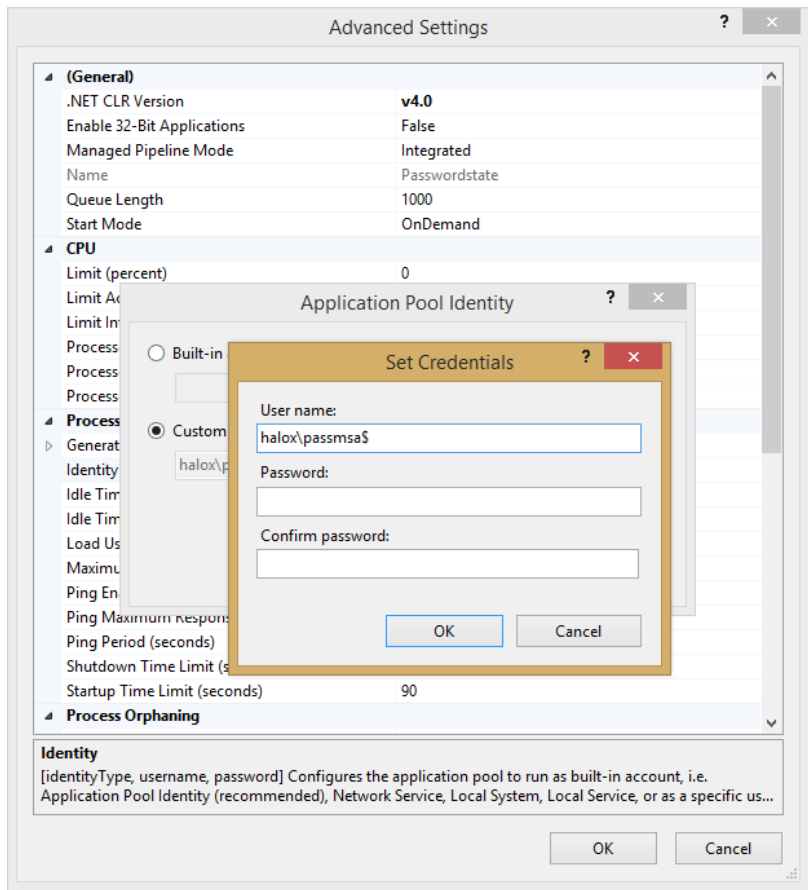


2. Grant the MSA Account db\_owner rights to the Passwordstate database



## Configure Passwordstate IIS Application Pools

You need to open Internet Information Services Manager, and modify the "Identity" for all of the Passwordstate Application Pools so it uses the MSA Account. When specifying the MSA Account to use, you leave the password fields blank, as per the screenshot below.



### Modify the Passwordstate web.config file

- Open the web.config file in the root of the Passwordstate folder (open as Admin with notepad or equivalent)
- Change the line:

```
<add name="PasswordstateConnectionString" connectionString="Data Source=<ServerName>;Initial Catalog=passwordstate;User ID=passwordstate_user;Password=<MyPassword>" providerName="System.Data.SqlClient" />
```

to read like:

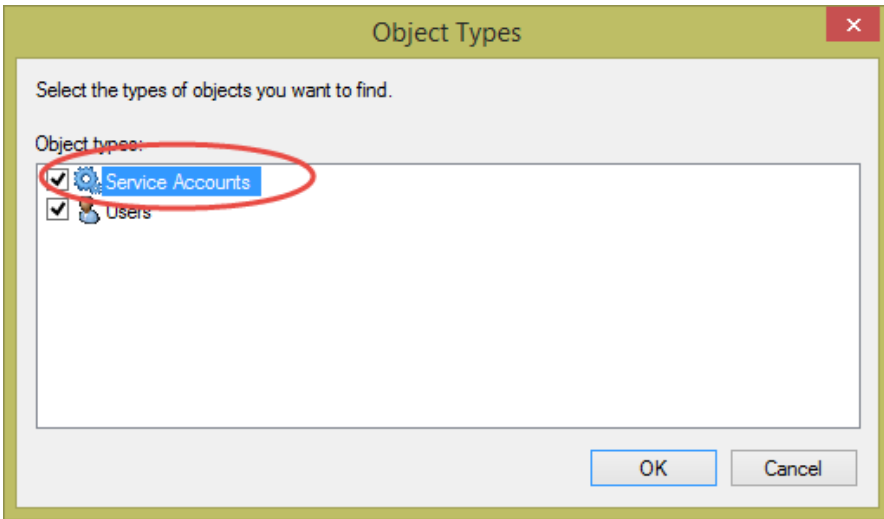
```
<add name="PasswordstateConnectionString" connectionString="Data Source=<ServerName>;Initial Catalog=passwordstate;Integrated Security=SSPI;" providerName="System.Data.SqlClient" />
```

- Save the file and exit notepad

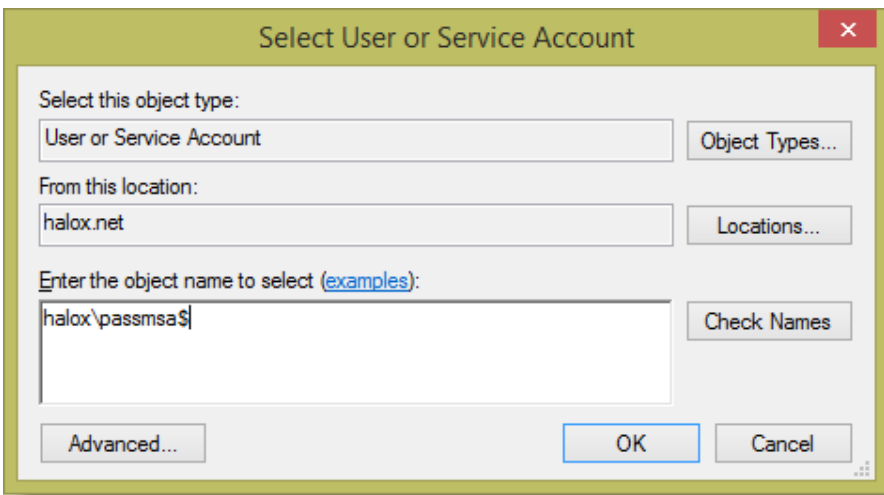
### Configure Passwordstate Windows Service

We now need to change the 'Log On As' property for the Passwordstate Windows Service to use the MSA Account.

When doing so, you may need to select the 'Service Accounts' Object Type in order to find the account in Active Directory, as per the screenshot below:



And also leave the password for the account blank, just like the Application Pools.



Now restart the Passwordstate Windows Service.

### File System NTFS Permissions

There are certain features where images and logos need to be written and read from the file system, requiring your MSA account to have access to do so. Please also apply Modify NTFS Permissions for the MSA Account to the Passwordstate folder, and all nested files/folders.

### Encrypted Web.config Settings and MSA Account

If you have encrypted either of the database connection string or AppSettings section in the web.config file, and you are using an MSA account, you also need to apply permissions to the RSA Key Container for the MSA Account, so the account can decrypt these settings. Below are instructions for how to do this:

- Open a command prompt as Admin and type CD  
C:\Windows\Microsoft.NET\Framework64\v4.0.30319
- Type the following:
  - `aspnet_regiis.exe -pa "NetFrameworkConfigurationKey" "Domain\MSA-AccountName$" (change the path if you've installed Passwordstate to a different location)`
- The restart the Passwordstate Windows Service

## 15 X-Forwarded-For Support

When Passwordstate adds auditing data to the database, it records the IP Address of the client who initiated an action which triggered the audit event.

As Passwordstate supports the “X-Forwarded-For (XFF) HTTP header field” for identifying the originating IP address of a client, and if you use any form of Load Balancing or Proxy Server caching, you may need to make configuration changes to your device/appliance. This will ensure the correct IP Address of the client is reported, instead of the load balancer or proxy server.

## 16 Troubleshooting Connectivity Issues

If when you first try and browse to the Passwordstate web site you get a blank page, or an error saying '**The page cannot be displayed because an internal server error has occurred.**', this may be caused by the order in which you installed Internet Information Services and the .Net Framework 4.5 – if you install the .NET Framework first, this error will occur.

Note: These instructions only apply to Microsoft Windows Server 2008 R2 and Windows 7

To resolve this, follow these instructions:

- Open a Command Prompt as an Administrator
- Type **CD C:\Windows\Microsoft.NET\Framework\v4.0.30319** or **C:\Windows\Microsoft.NET\Framework64\v4.0.30319** depending on our operating system version
- Now type **aspnet\_regiis -i**
- After ASP.NET has been re-registered, ensure the Passwordstate Application Pool in IIS is set to 'Integrated Managed Pipeline Mode', and then restart IIS (you need to open the Internet Information Services (IIS) Manager tool to do this)
- Now open your browser and point it back to the Passwordstate web site

You may need to do this for both the 32bit and 64bit versions on the Framework directories above if you still experience issues.

## 17 McAfee and Constant Logout Issues

McAfee's Anti-Virus On-Demand scan can cause issues with logging users out of Passwordstate prematurely, before the default IIS session time of 10 minutes.

The On-Demand scan process isn't blocking the accessing of any files, but when it scans either the web.config file, or any files in the /bin folder, it can cause sessions in IIS to end.

We recommend excluding the Passwordstate folder from On-Demand scanning, as this has helped a lot of customers.

If you are seeing the same symptoms, but are using a different Anti-Virus suite, please also exclude the Passwordstate folder from real-time scanning to see if this helps.