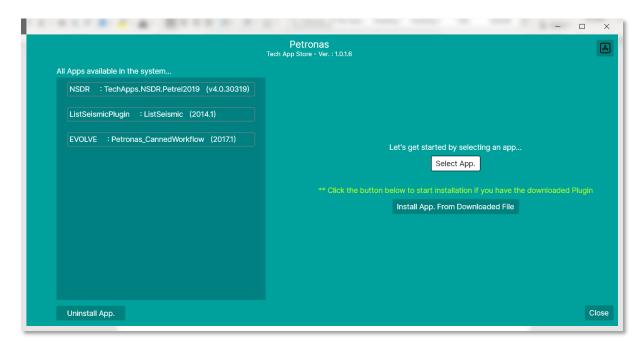
TechAppLauncher

Application Name	TechAppLauncher
Application Framework	.Net 5.0
UI Framework	Avalonia
IDE	Visual Studio 2019
Repository	https://github.com/azzulhisham/Petronas_TechAppLauncher.git
Application Url	N/A – Standalone Desktop Application
Host	Software Center

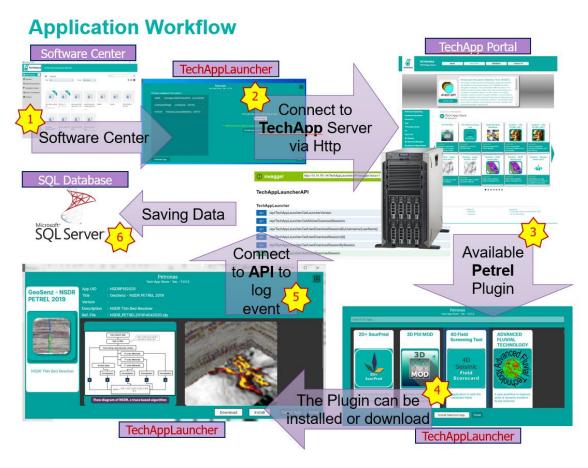
Overview



TechAppLauncher is a standalone desktop application that engaging the **Avalonia UI framework**. The Application is hosted at the **Software Center** in order to distribute to the client.

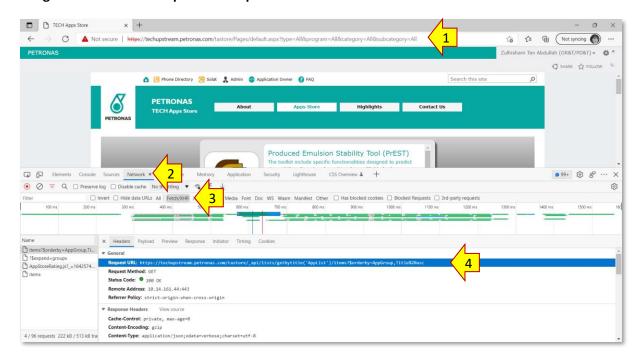
Click the link <u>Basics - Avalonia (avaloniaui.net)</u> in order to learn more about Avalonia. You can follow the tutorial provides by the home page of Avalonia in order to understand how the application works in details.

The entire flow of the application is describes in the next page.

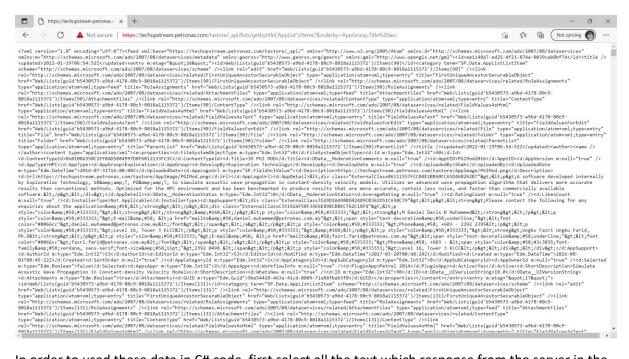


- 1. The application is hosted in the **Software Center**, hence user need to be installed the application from the **Software Center**.
- 2. The application is connected to the **TechApp Store Portal** to retrieve all the available app in the **TechApp store**.
- 3. The application list all the available application which is typically identical to the **TechApp Store portal**.
- 4. The application provides the **download** feature as well as **install** feature to the client.
- 5. Whenever user successfully download or install a TechApp's application, it will then connect to its **API**.
- 6. The application updates necessary download session information through its API.

Using Browser to track important endpoint



- 1. Browser to the **TechApp Store Portal** and then press '**F12**' to enter to the developer tools.
- 2. In the Developer tool, select 'Network' tab.
- 3. Switch to 'Fetch/XHR' mode and then refresh the page.
- 4. The endpoint shown in the 'Headers' tab is used by the TechAppLauncher in order to retrieve all the available app in TecApp Store. You can copy the URL of the endpoint and then paste it to your browser, the screenshot below shows the response from the server in xml format.



In order to used these data in C# code, first select all the text which response from the server in the browser, and then switch Visual Studio 2019, add a new class file to the desire folder that you wish, make sure the new added class file is being selected. Then, in the menu, select 'Edit' >> 'Paste

Special' >> 'Paste XML as Classes'. Since the data return from the server is in XML format, we need to engage the 'Paste XML as Classes' to help us convert the data format into C# entity. If you are pro in XML then you may skip this step. The generate C# class is actually serves as an temporary object to keep the XML data.

```
TechAppLauncher - TechAppStoreService.cs*
   echAppStoreService.cs* + ×
C# TechAppLauncher
                                                  • ** TechAppLauncher.Services.TechAppStoreService
public async Task<IList<Models.App>> GetAllAsync()
                                                                                                                                                                                                                                      ▼ Ø GetAllAsync()
                                                            string url = @"https://techupstream.petronas.com/tastore/ api/lists/getbytitle('AppList')/items?$orderby=AppGroup,Titl
            48
            51
            52
                                                                     Method = HttpMethod.Get,
            53
            54
55
56
                                                            request.Headers.Accept.Clear():
                                                           request.Headers.Accept.Add(new MediaTypeWithQualityHeaderValue("application/json"));
            57
58
                           16
                                                            s_httpClient = new HttpClient(_handler);
            59
                                                            s_httpClient.DefaultRequestHeaders.Accept.Clear();
            60
                                                           s httpClient.DefaultRequestHeaders.Accept.Add(new MediaTypeWithQualityHeaderValue("application/json"));
            61
            62
                                                            var response = await s_httpClient.SendAsync(request, HttpCompletionOption.ResponseContentRead);
            63
                                                            //var content = await response.Content.ReadFromJsonAsync(typeof(Models.AppDetail));
            64
                                                            var content = await response.Content.ReadAsStringAsync();
            65
            66
                                                            Serializer serializer = new Serializer();
            67
                                                            //var feeds = serializer.DeserializeFeed(content);
                                                            var feeds = serializer.Deserialize<Models.xml.AppList.feed>(content);
            69
            71
                                                            var results = feeds.entry.Select(s => new Models.App()
            72
73
                                                                      AppUID = s.content.properties.AppUID != null ? s.content.properties.AppUID.Value : "",
            74
                                                                     AppType = s.content.properties.AppType != null ? s.content.properties.AppType : "",
PluginApp = s.content.properties.PluginApp != null ? s.content.properties.PluginApp.Value : "",
            75
76
                                                                     ID = s.content.properties.ID != null ? s.content.properties.ID.Value : 0,
Title = s.content.properties.Title != null ? s.content.properties.Title.Value : "",
                                                                     Short Description = \texttt{s.content.properties.Short} Description ~!= \texttt{null} ~? ~ \texttt{s.content.properties.Short} Description. \\ Value ~: ~ \texttt{s.content.properties.Short} Description ~!= \texttt{s.content.properties.
                                                                     AppLogoUrl = new Models.AppLogoUrl()
            81
                                                                              Url = s.content.properties.ApplogoUrl != null && s.content.properties.ApplogoUrl.Url != null ? s.content.prope
            83
                                                            }).ToList();
                                                            return results;
```

If we look t the code, line 48 to line 62 is actually send out the http request to the server. The data came from the server is then read as a string (which is XML) and keep in variable 'content', this is in line 64.

In line 68, the content in variable 'content' is then deserialize into C# object 'feeds'. Line 71 to line 83, it picks up those necessary data as 'result' object and send back to the caller as a list in line 85.

The function is call whenever user click the 'Select App.' button^[5].

The screenshot below shows the code where the function is being called (line 136).



```
TechAppLauncher - AppStoreViewModel.cs
AppStoreViewModel.cs ≠ ×
C# TechAppLauncher
                                      ▼ 1 TechAppLauncher.ViewModels.AppStoreViev ▼ 💝 ListAllApp()
                                                                                                                         ‡
    125
    126
                     1 reference | Zulhisham Tan Abdullah, 7 days ago | 1 author, 1 change
    127
                     private async void ListAllApp()
    128
    129
                          _cancellationTokenSource?.Cancel();
                         _cancellationTokenSource = new CancellationTokenSource();
    130
    131
    132
    133
                              //Call API
    134
                              ITechAppStoreNetworkRequestService techAppStoreService = new TechAppStoreService();
    135
                              _apps = await techAppStoreService.GetAllAsync();
    136
    137
                              await LoadAppListView(_apps);
    138
    139
                         catch (Exception ex)
    140
    141
    142
    143
    144
            2 0
                  <u>1</u>5 ← → | ≪ ▼ ← ■
                                                                                              Ln: 137 Ch: 1 SPC
```

The 'ListAllApp()' function is actually being call from the class's constructor.

```
TechAppLauncher - AppStoreViewModel.cs
AppStoreViewModel.cs ≠ ×
C# TechAppLauncher
                                    ▼ TechAppLauncher.ViewModels.AppStoreViev ▼ Ø AppStoreViewModel()
                                                                                                                     ‡
                     1 reference | Zulhisham Tan
                    public AppStoreViewModel()
     78
                         var assemblyVersion = Assembly.GetExecutingAssembly().GetName().Version;
     79
                        AppTitleBar = $"Tech App Store - Ver. : {assemblyVersion.Major}.{assemblyVersion.MajorRev
     80
     81
                         this.WhenAnyValue(x => x.SearchText)
                             .Throttle(TimeSpan.FromMilliseconds(400))
                             .ObserveOn(RxApp.MainThreadScheduler)
     83
                             .Subscribe(DoSearch!);
    84
     85
     86
                        GetAppSelectCommand = ReactiveCommand.Create(() =>
     87
     88
     89
                             return SelectedApp;
     90
                        });
     91
                         GetAppSelectCommandClose = ReactiveCommand.Create(() =>
     92
     93
    94
                             SelectedApp = null;
     95
                             return SelectedApp;
     96
     97
     98
                        ListAllApp();
     99 💉
            ② 0 ▲ 5
                          ← → | ﴿ ▼ ← |
                                                                                            ▶ Ln: 99 Ch: 1 SPC LF
```

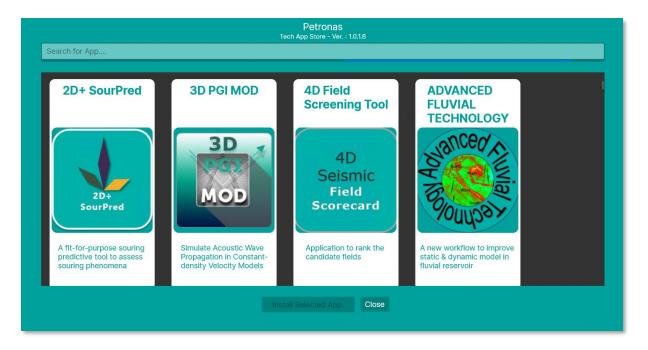
The 'AppStoreViewModel.cs' is a view model for 'AppStoreView' interface.

```
TechAppLauncher - MainWindowViewModel.cs
C# TechAppLauncher
                                                                                                                                                      ▼ TechAppLauncher.ViewModels.MainWindowViewModel ▼ ♥ MainWindowViewModel()
                                                                     public MainWindowViewModel()
             195
                                                                                   var assemblyVersion = Assembly.GetExecutingAssembly().GetName().Version;
            196
                                                                                  App Title Bar = \$"Tech \ App \ Store - Ver. : \{assembly Version. Major\}. \{assembly Version. Major Revision\}. \{assembly Version. Bayer Store - Ver. : \{assembly Version. Major Revision\}. \{assembly Version. Major Revision]. \{assembly Version. Major Revision. Major Revisi
            197
             198
                                                                                      _techAppStoreService = new TechAppStoreService();
            199
                                                                                                                                                                                                                                                  del, AppViewModel?>();
            200
             201
                                                                                   ShowMsgDialog = new Interaction<MessageDialogViewModel, MessageDialogViewModel>();
                                                                                  ShowRemoveAppDialog = new Interaction<RemoveAppViewModel, RemoveAppViewModel>();
            202
             204
                                                                                  SelectAppCommand = ReactiveCommand.CreateFromTask(async () =>
            205
                                                                                                var versionControl = await _techAppStoreService.GetLauncherVersion();
            207
                                                                                                if (versionControl != null)
            208
            210
                                                                                                              if \ (assembly Version. Major \ < \ version Control. Major \ | \ | \ assembly Version. Major Revision \ < \ version Control. Major Revision. Major Revision \ < \ version Control. Major Revision \ < \ version \ < 
                                                                                                                            assemblyVersion.Build < versionControl.Minor || assemblyVersion.Revision < versionControl.MinorRevision
             211
                                                                                                                           string messageBoxText = "There is a newer version available.\r\nKindly update your app before start.";
var messageBoxDialog = new MessageDialogViewModel(messageBoxText, Enums.MessageBoxStyle.IconStyle.Warn:
            213
            214
            215
                                                                                                                           await ShowMsgDialog.Handle(messageBoxDialog);
            216
            217
                                                                                                                           return;
            218
            219
            220
            221
                                                                                                             string messageBoxText = "Your system is not in the correct network.\r\nThis app will not work correctly.";
            222
            223
                                                                                                              var messageBoxDialog = new MessageDialogViewModel(messageBoxText, Enums.MessageBoxStyle.IconStyle.Warning)
            224
                                                                                                              await ShowMsgDialog.Handle(messageBoxDialog);
            225
            226
                                                                                                var store = new AppStoreViewModel();
            227
                                                                                                var result = await ShowAppDialog.Handle(store);
            228
            229
                                                                                                if ( refFileDetails == null)
             230
                                      Ln: 201 Ch: 1 SPC CRLF
```

Now, here is the magic happened in **Avalonia**. From the screenshot above, line 204, this is where the command is being fired when the 'Select App.' Button is pressed. It shows the dialogue of **AppStoreView**. Whenever the user select an app to install, the **AppStoreView** will returns a **result** to the main window which is in line 228 as a **AppViewModel** defined in line 200. The AppViewModel contain all the information about the selected app.

```
TechAppLauncher - AppViewModel.cs
AppViewModel.cs → ×
                                                        ▼ TechAppLauncher.ViewModels.AppViewModel
                                                                                                                    - €_a_app
C# TechAppLauncher
                                                                                                                                                                                + ‡
                         1 reference | Zulhisham Tan Abdullah, 7 days ago | 1 auth

public | AppViewModel (Models. App app)
      19
      21
                         1 reference | Zulhisham Tan Abdullah, 7 days ago | 1 author, 1 change
      22
                         public string Description => _app.ShortDescription;
      23
                         1 reference | Zulhisham Tan Abdullah, 7 days ago | 1 author, 1 change
                         public string Title => _app.Title;
      25
                         0 references | Zulhisham Tan Abdullah, 7 days ago | 1 author, 1 change
      26
                         public string AppGroup => _app.AppGroup;
      27
                         2 references | Zulhisham Tan Abdullah, 7 days ago | 1 author, 1 change
                         public int AppId => _app.ID;
      29
                         4 references | Zulhisham Tan Abdullah, 7 days ago | 1 author, 1 change
                         public string AppUID => _app.AppUID;
1 reference | Zulhisham Tan Abdullah, 7 days ago | 1 author
      30
                         public string AppType => _app.AppType;
      31
                         public string PluginApp => _app.PluginApp;
      33
                         2 references | Zulhisham Tan Abdullah, 7 days ago | 1 author, 1 ch
      34
                         public double? AppVersion => _app.AppVersion;
      35
                         private Bitmap? _appImg;
      37
                         1 reference | Zulhisham Tan Abdullah, 7 days ago | 1 author, 1 change
                         public Bitmap? AppImg
      38
      40
                               get => _appImg;
                              private set => this.RaiseAndSetIfChanged(ref _appImg, value);
      41
      43
                          1 reference | Zulhisham Tan Abdullah, 7 days ago | 1 author, 1 change
                          public async Task LoadAppImage()
              ⊗ 0 1 1 ← → | ♥ ▼ 4
                                                                                                                               ▶ Ln: 13 Ch: 30 SPC
```



While preparing the interaction user-interface as shown above, the TechAppLauncher make another http call to the Server (line 232 in the following screenshot).

```
TechAppLauncher - MainWindowViewModel.cs
MainWindowViewModel.cs → ×
C# TechAppLauncher
                                             ▼ 1 TechAppLauncher.ViewModels.MainWindowViewModel ▼ ⊗ MainWindowViewModel()
                             var store = new /
                             var result = await ShowAppDialog.Handle(store);
    229
                             if ( refFileDetails == null)
    230
                                 _refFileDetails = await _techAppStoreService.GetAllRefFilesAsynd();
   232
   233
    235
                            bool isLaunchAble = false;
                             this.IsLaunchAble = isLaunchAble;
   236
    237
                             this.IsDownloadAble = false;
   238
    239
    240
                             if (result != null && _refFileDetails != null)
   241
    242
    243
                                 Apps.Add(result);
   244
    245
                                 var refFileDetailSelect = _refFileDetails.Where(n => n.AppUID == result.AppId.ToString()).FirstOrDefault()
    246
                                 var refFileUrl = refFileDetailSelect != null ? refFileDetailSelect.FileRefUrl : null;
                                                                                                                  ▶ Ln: 232 Ch: 85 SPC CRLF
```

This is to get all the zip file that attached to the specific application based on **AppUID**. Notice that it is picking up all the necessary data (line 159 to line 162) such as AppUID, File URL, Title of the app and etc...

```
TechAppLauncher - TechAppStoreService.cs
「echAppStoreService.cs ≠ ×
C# TechAppLauncher

▼ TechAppLauncher.Services.TechAppStoreService

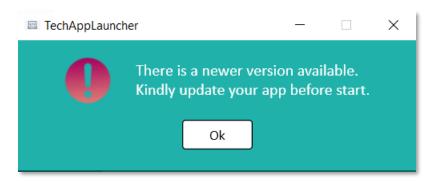
                                                                                            ▼ GetAllRefFilesAsync()
                    public async Task<IList<RefFileDetail>>> GetAllRefFilesAsync()
   133
   134
                        string url = @"https://techupstream.petronas.com/tastore/ api/lists/getbytitle('AppVault')/items";
   135
                        var request = new HttpRequestMessage()
   136
   137
                             RequestUri = new Uri(url),
   138
                            Method = HttpMethod.Get,
   139
   140
   141
                        request.Headers.Accept.Clear();
    142
                        request.Headers.Accept.Add(new MediaTypeWithQualityHeaderValue("application/json"));
   143
                        s httpClient = new HttpClient( handler);
   144
   145
                        s_httpClient.DefaultRequestHeaders.Accept.Clear();
   146
                        s\_httpClient.DefaultRequestHeaders.Accept.Add(new MediaTypeWithQualityHeaderValue("application/json")); \\
   147
   148
   149
   150
                             var response = await s httpClient.SendAsync(request, HttpCompletionOption.ResponseContentRead);
                            var content = await response.Content.ReadAsStringAsync();
   152
   153
                            Serializer serializer = new Serializer();
                             var feeds = serializer.Deserialize<Models.xml.AppRefFile.feed>(content);
   155
   156
                             var results = feeds.entry.Select(s => new RefFileDetail()
   158
   159
                                 AppUID = s.content.properties.AppUIDId != null ? s.content.properties.AppUIDId.Value : "",
                                 Title = s.content.properties.Title != null ? s.content.properties.Title.Value :
                                 FileID = s.content.properties.ID?.Value,
   161
                                 FileRefUrl = feeds.@base + s.id.Trim() + "/File"
   162
   163
                             }).ToList();
   164
   165
                             return results;
   166
   167
                         catch (Exception ex)
                         ← → | ◊ ▼ ← |
                                                                                                                  ▶ Ln: 132 Ch: 68 SPC CRLF
```

Hence, based of the file URL, the TechAppLauncher knows where to download the attachment files.

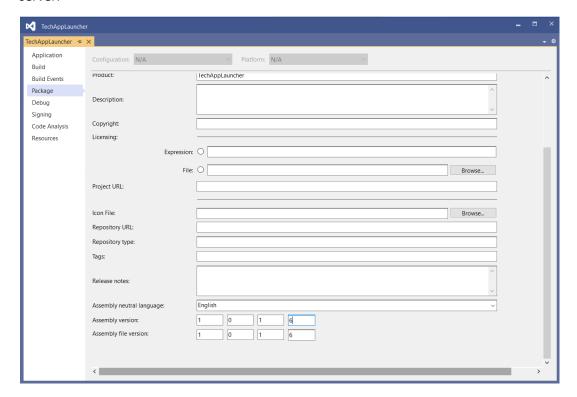
TechAppLauncherAPI

There are few important endpoints that the **TechAppLauncher** connected to:

- /api/TechAppLauncher/GetLauncherVersion
- /api/TechAppLauncher/GetlauncherAppConfig
- 3. /api/TechAppLauncher/GetUserDownloadSessionsByUsername
- 4. /api/TechAppLauncher/AddUserDownloadSession
- 5. /api/TechAppLauncher/GetAppDistributionReferenceDetailByAppUID
- 1. **GetLauncherVersion** The launcher uses this information to determine whether the client is using the latest version of the application, otherwise it will prompt the user with the message as shown below.



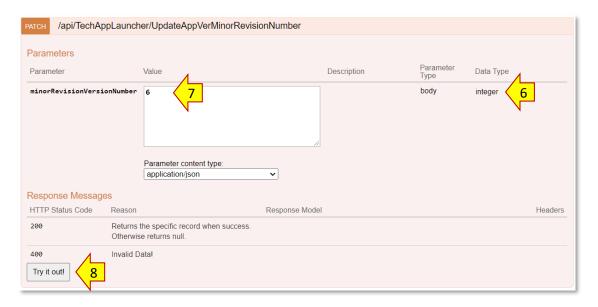
The launcher version number is set at it's project property as shown below. Hence, it is recommended to increase the number every time there is a new update deploy to the server.



You can use the following endpoints to update the version number.

- i. /api/TechAppLauncher/UpdateAppVerMajorNumber
- ii. /api/TechAppLauncher/UpdateAppVerMajorRevisionNumber
- iii. /api/TechAppLauncher/UpdateAppVerMinorNumber
 - iv. /api/TechAppLauncher/UpdateAppVerMinorRevisionNumber

Let's try update the Launcher's minor revision version number. Open your browser and go to http://10.14.161.44/TechAppLauncherAPI/swagger/ui/index#/TechAppLauncher. Make sure your VPN is connected if you are not in the Petronas network. Then look for the endpoint '/api/TechAppLauncher/UpdateAppVerMinorRevisionNumber'.



On the swagger page, the endpoint required a parameter 'minorRevisionVersionNumber' which is an integer data type^[6]. Since it is an integer, enter a desire version number^[7] without any quotation mark. When done, click on the 'Try it out' button^[8].

In the HTTP response as shown in the screenshot at the following screen, the swagger page shown the fully qualified URL^[9] for the request. The response status code shows that is **200**^[10] which is **'OK'**. The message body shown the entire updated version number^[11].

Note that if the request is fails, it will return **HTTP status code 400** which is a **bad request**. In this case, you need to check the parameter that you gave is meet the data type requirement. Otherwise, the failure may due to the server itself. The possible courses may due to the failure to connect to the database server.



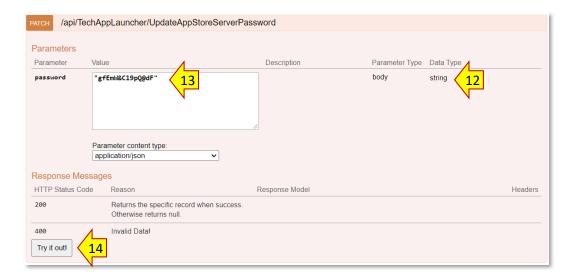
2. **GetlauncherAppConfig** – The launcher uses this endpoint to retrieve the **TechApp Store** server credentials.

Since the server credentials might need to update in a period of time, you can update the credential information with the following endpoints.

- i. /api/TechAppLauncher/UpdateAppStoreServerDomainName
- ii. /api/TechAppLauncher/UpdateAppStoreServerUserName
- iii. /api/TechAppLauncher/UpdateAppStoreServerPassword

Let's try update the **App Store's Server Password**. Open your browser and go to http://10.14.161.44/TechAppLauncherAPI/swagger/ui/index#/TechAppLauncher. As usual, you must make sure your VPN is connected if you are not in the Petronas network. Then look for the endpoint '/api/TechAppLauncher/UpdateAppStoreServerPassword'.

On the swagger page, the endpoint required a parameter 'password' which is a string data type^[12]. Since it is a string data type, enter a desire password^[13] with a quotation mark as shown in the screenshot in following page. When done, click on the 'Try it out' button^[14].

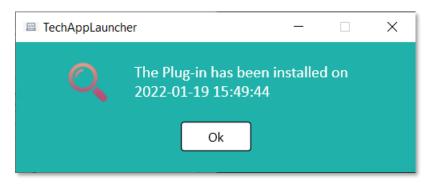


In the HTTP response as shown in the screenshot below, the swagger page shown the fully qualified URL^[15] for the request. The response status code shows that is **200**^[16] which is **'OK'**. The message body shown the entire updated Application Configuration^[17].

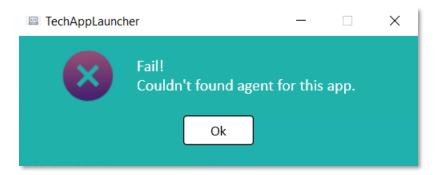
Note that if the request is fails, it will return **HTTP status code 400** which is a **bad request**. In this case, you need to check the parameter that you gave is meet the data type requirement. Otherwise, the failure may due to the server itself. The possible courses may due to the failure to connect to the database server.

```
Response Body
                                         17
          "Id": 1,
          "LauncherVerMajor": 1.
          "LauncherVerMajorRev": 0,
         "LauncherVerMinor": 0,
          "LauncherVerMinorRev": 6,
         "AppStoreServerDomain": "petronas",
          "AppStoreServerUser": "techus.admin"
          "AppStoreServerPwd": "gfEmW&C19pQ@dF",
          "LauncherInfo": "'
Response Code
                    16
Response Headers
   {
    "cache-control": "no-cache",
      "cache-control": "no-cache",
"content-encoding": "gzip",
"content-length!" "246",
"content-tepgth!" "246",
"content-type": "application/json; charset=utf-8",
"date!" "lwed, 26 Jan 2022 06:41:38 GMT",
"expires": "-1",
"microsoftsharepointteamservices": "15.0.0.4569",
"pragma": "no-cache",
"server": "Microsoft-IIS/8.5",
"vary": "Accept-Encoding",
"x-aspnet-version": "4.0.30319",
"x-content-type-options": "nosniff",
"x-content-type-options": "nosniff",
"x-cns-invokeapp": "1; RequireReadOnly",
"x-powered-by": "ASP.NET"
```

3. **GetUserDownloadSessionsByUsername** – The launcher uses this endpoint to determine whether a specific plugin had already installed at the client workstation. Its will prompt the message as shown below if that specific plugin had already installed.



- 4. **AddUserDownloadSession** The launcher uses this endpoint to insert new record of User Download Session into the database.
- 5. **GetAppDistributionReferenceDetailByAppUID** The launcher uses this endpoint to find for the installation agent for a specific application such as **Software Center**. The launcher will prompt an error message if you try to install a standalone application but there is no information has been setup in the database.



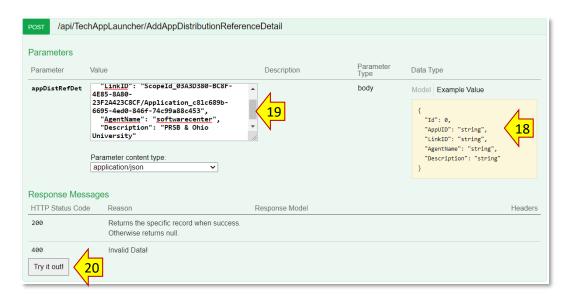
You can use the following endpoint to add and to delete a specific agent.

- i. /api/TechAppLauncher/AddAppDistributionReferenceDetail
- ii. /api/TechAppLauncher/DeleteAppDistributionReferenceDetail

You can also update the details of a specific agent with the following endpoints.

- i. /api/TechAppLauncher/UpdateAppDistributionReferenceDetailByApp
 UID
- ii. /api/TechAppLauncher/UpdateAppDistributionReferenceDetailById

Now, let's try to add an application distribution reference detail. Open your browser and go to http://10.14.161.44/TechAppLauncherAPI/swagger/ui/index#/TechAppLauncher. As usual, you must make sure your VPN is connected if you are not in the Petronas network. Then look for the endpoint '/api/TechAppLauncher/AddAppDistributionReferenceDetail'.



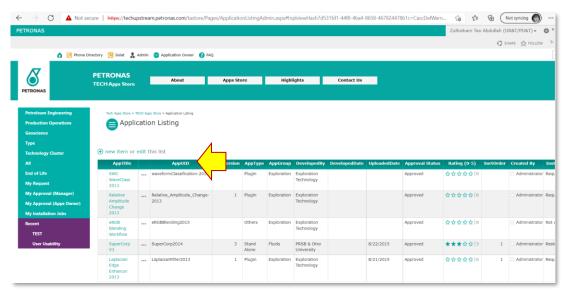
On the swagger page, the endpoint required a parameter 'appDistRefDet' which is an object data type^[18]. Since it is an object data type, you need to enter a json format data object^[19] as shown in the code below as an example (refer to the screenshot as well). You can ignore the 'Id' entity since it will be generated by the database server. Whereas, you need to the TechApp Store portal for the AppUID. It is unique, which means you couldn't have it duplicated in the database.

```
{
   "AppUID": "SuperCorp2014",

   "LinkID": "ScopeId_03A3D380-BC8F-4E85-8A80-23F2A423C8CF/Application_c81c689b-6695-4ed0-846f-74c99a88c453",

   "AgentName": "softwarecenter",

   "Description": "PRSB & Ohio University"
}
```



When done, click on the 'Try it out' button[14].

In the HTTP response as shown in the following screenshot, the swagger page shown the fully qualified URL^[21] for the request. The response status code shows that is **200**^[22] which is **'OK'**. The message body shown the entire new application distribution reference detail^[23] which has been successfully added into the database. Note that the payload included the **'Id'** property and the entity is given a number by the database server.

Note that if the request is fails, it will return **HTTP status code 400** which is a **bad request**. In this case, you need to check the parameter that you gave is meet with the data type requirement. Otherwise, the failure may due to the server itself. The most possible courses may due to the failure to connect to the database server.