

Install Aspen & Aspen HYSYS – Python interface

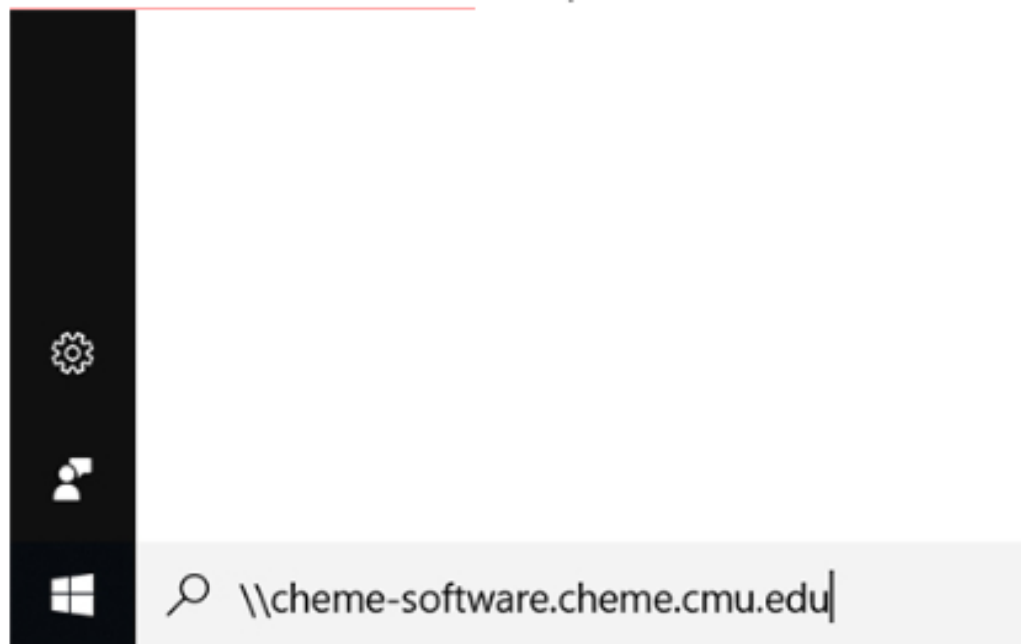
10/23/2019

Jonggeol Na

Install Aspen

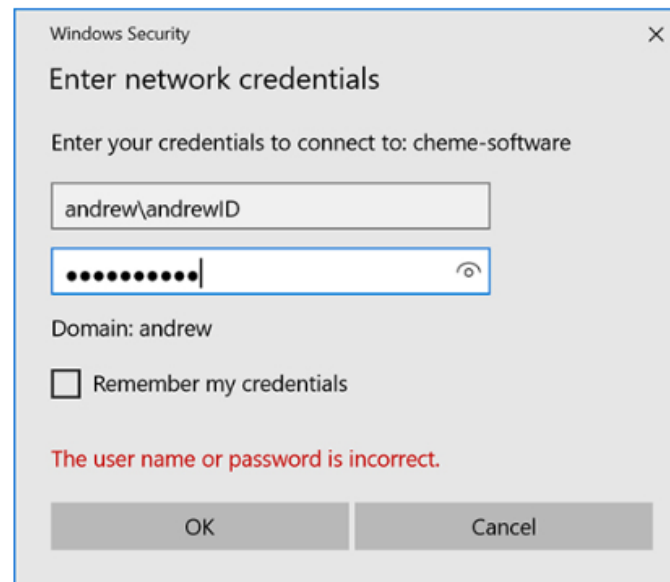
Accessing Software Share in CMU ChmE

1. Click Start and then type <\\cheme-software.cheme.cmu.edu> and press



Accessing Software Share in CMU ChmE

2. You will be prompted with a box titled Enter Network Password as shown below:



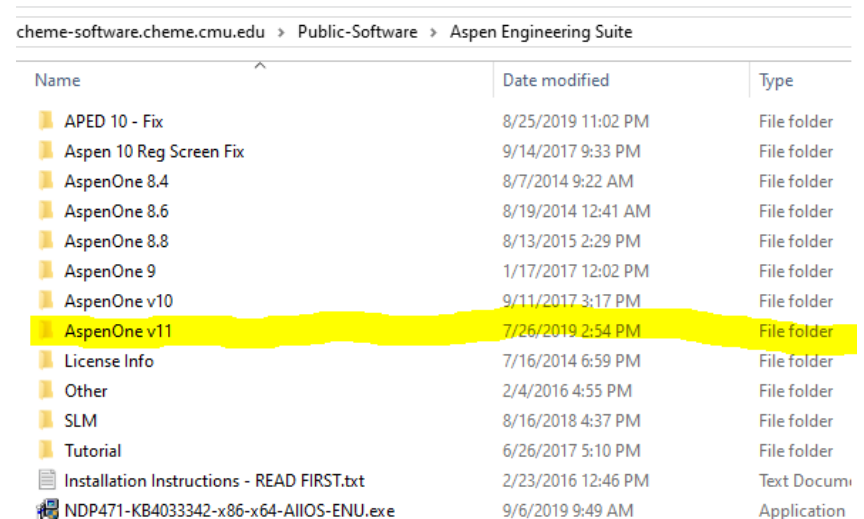
In the **Username** field, type **andrew\AndrewId**, where *AndrewId* is your given Andrew ID from the university. In the **Password** field, type in your Andrew password.

Copy AspenOne V11 folder

3. If you have done this correctly, a window titled **cheme-software** will open, and you have successfully connected to the server.

4. Double-click on the **Public-Software** folder.

5. Copy AspenOne v11 (~11 Gb) in your local Computer



cheme-software.cheme.cmu.edu > Public-Software > Aspen Engineering Suite

Name	Date modified	Type
APED 10 - Fix	8/25/2019 11:02 PM	File folder
Aspen 10 Reg Screen Fix	9/14/2017 9:33 PM	File folder
AspenOne 8.4	8/7/2014 9:22 AM	File folder
AspenOne 8.6	8/19/2014 12:41 AM	File folder
AspenOne 8.8	8/13/2015 2:29 PM	File folder
AspenOne 9	1/17/2017 12:02 PM	File folder
AspenOne v10	9/11/2017 3:17 PM	File folder
AspenOne v11	7/26/2019 2:54 PM	File folder
License Info	7/16/2014 6:59 PM	File folder
Other	2/4/2016 4:55 PM	File folder
SLM	8/16/2018 4:37 PM	File folder
Tutorial	6/26/2017 5:10 PM	File folder
Installation Instructions - READ FIRST.txt	2/23/2016 12:46 PM	Text Document
NDP471-KB4033342-x86-x64-AILOS-ENU.exe	9/6/2019 9:49 AM	Application

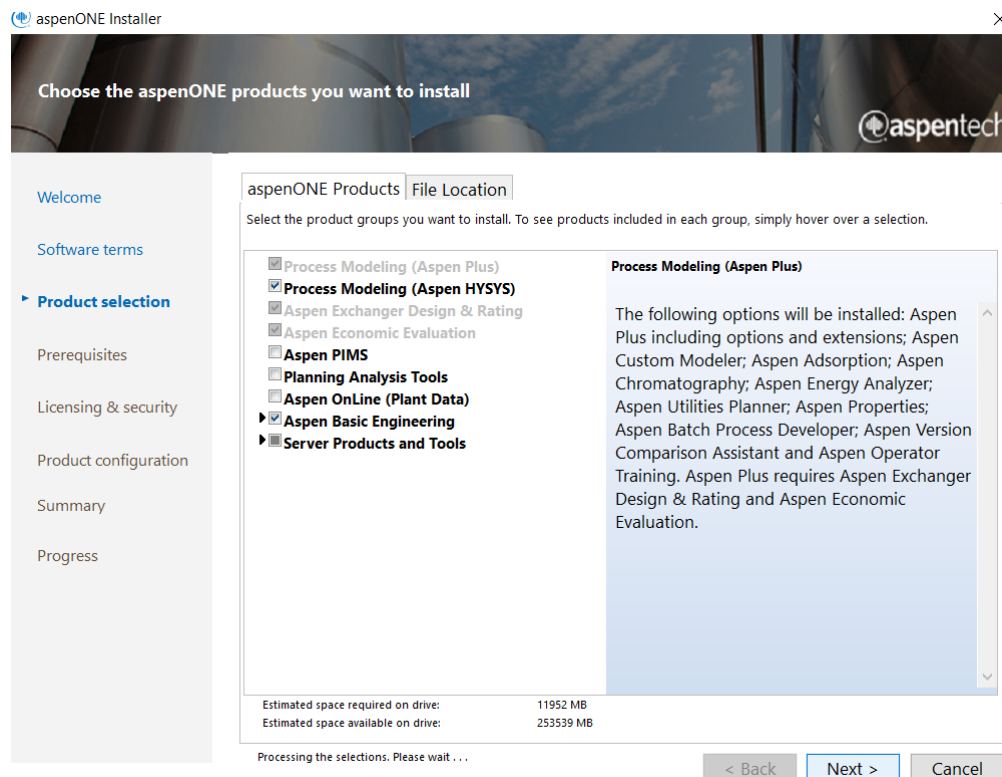
Installation Instructions

- Detailed Installation Instructions are located here:

<https://www.cmu.edu/cheme/computing/software/licensed-software-list/aspen-engineering-suite.html>

Installation Instructions

- Run Setup.exe in ../aspenONE_V11_ENG
- Please add Process Modeling (Aspen HYSYS)



Installation Instructions

- License Server: `licensing.cheme.cmu.edu`
- Configure Buckets: Default

aspenONE Installer

Specify licensing & security

Please provide the licensing and Security server information below.

Licensing

AspenTech controls the use of aspenONE Products through the Software License Manager (SLM). This step allows you to set up the SLM information on this machine. SLM allows two types of licensing: Network and Standalone. Network licensing obtains the aspenONE Product licenses across a network connection from a network-license-server computer. Standalone licensing obtains licenses from the same computer on which the aspenONE Products are installed. For more information, please see the SLM Installation and Reference guide.

For network configurations, please provide a list of license servers for AspenTech products. Install will keep the server names and bucket numbers already configured on this machine. Additional buckets can be added through the SLM Configuration Wizard.

License server: ...

☒ Resolve server name

For a standalone license file that is local on this computer, browse to the location.

License file:

< Back Next > Cancel

Click add Server
before click Next

Installation Instructions

- Type password you like

Basic Engineering

Please use the default username (AZnnn_) to create a new Broker Service account, or enter an existing user name and password for the Broker Service account.

User

There is a 20 character limit for the Broker Service Account name. The name should only contain characters(A-Z, a-z), digits(0-9), "-" and "_".

Password:

Confirm

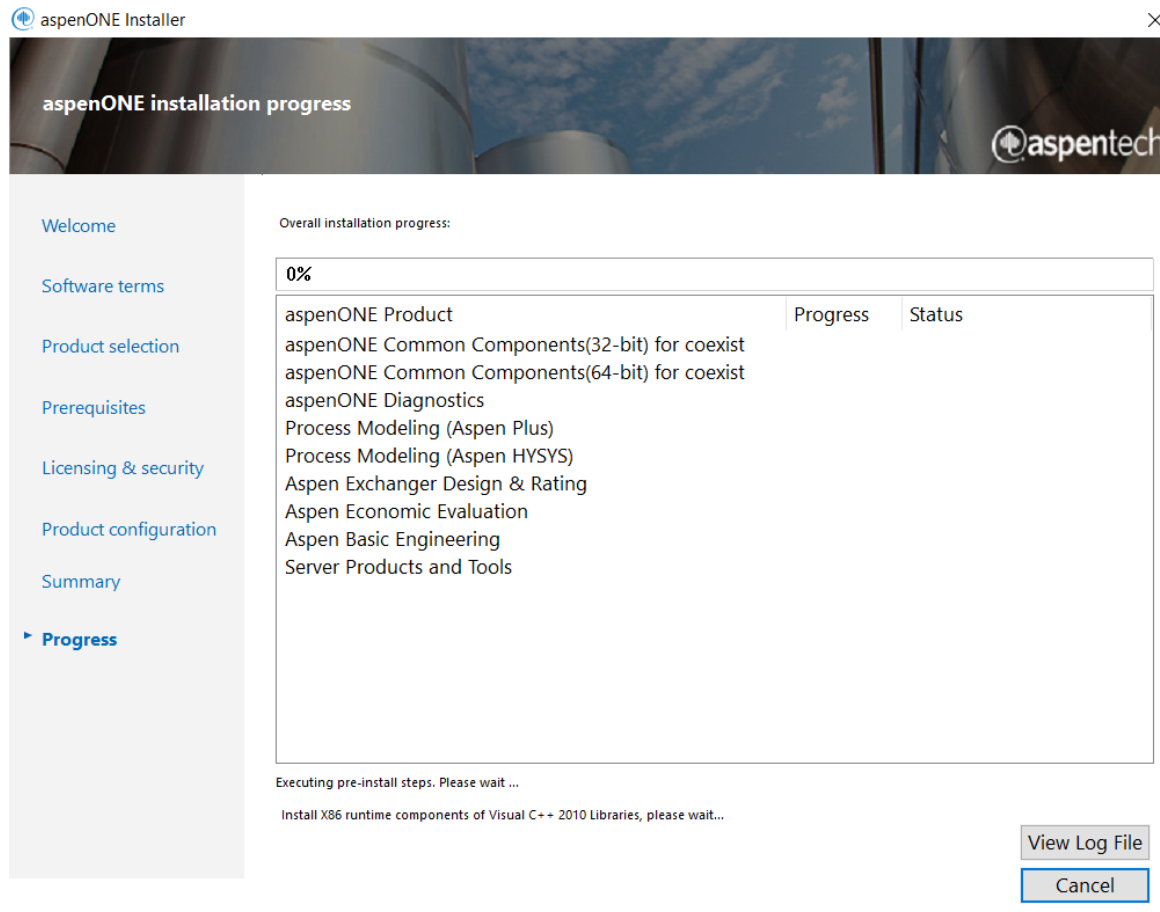
The password must conform to your network policy. Providing an invalid password will cause the Basic Engineering Broker Service to fail to start.

Note: A default TCP Port will be selected. You will be able to change it later.

< Back Next > Cancel

Installation Instructions

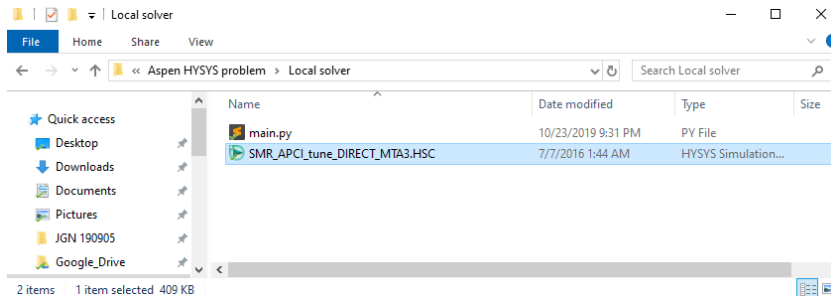
- Wait for installation



Aspen HYSYS – Python interface

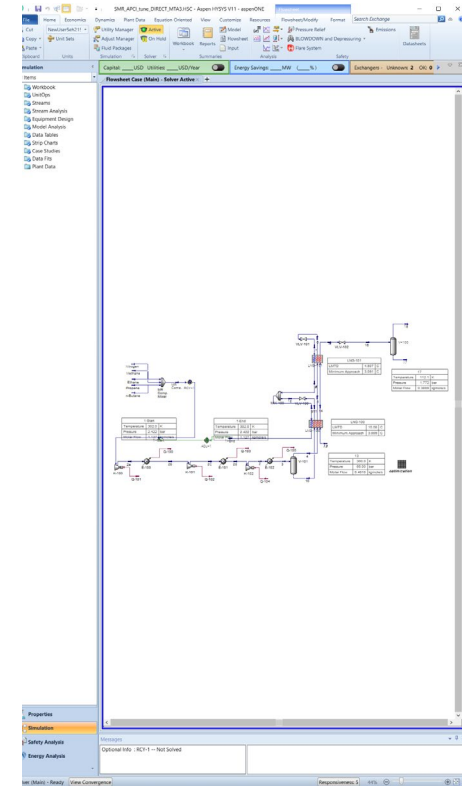
Aspen HYSYS

- Run Hysys file “SMR_APCI.HSC”



- To understand the process, please refer to

Na, J., Lim, Y., & Han, C. (2017). A modified DIRECT algorithm for hidden constraints in an LNG process optimization. *Energy*, 126, 488-500.



Run main.py

- Just run main.py then you can get:

$$y = f_{HYSYS}(x)$$

where y is objective function to be minimized (Total Energy Consumption / LNG Production(Ton per day)) and $x \in \mathbb{R}^{1 \times 8}$ is input vector.

Table 3

The lower and upper bounds of design variables.

Property	Lower bounds	Upper bounds
Pressure variables (bar)		
LP	0.300	5.700
MP1	0.750	14.250
MP2	1.875	35.625
HP	4.675	88.825
Composition variables (%)		
Nitrogen	0.859	16.321
Methane	2.597	49.343
Ethane	2.541	48.279
Propane	3.911	74.309
n-Butane	dependent	

main.py

```
main.py ×
main.py > ...
1  import os
2  import win32com.client as win32
3  import numpy as np
4  import time
5
6  ''' Connecting to the Aspen Hysys App just one time during optimization'''
7  print(' # Connecting to the Aspen Hysys App ... ')
8  hyapp    = win32.Dispatch('HYSYS.Application')           # Connecting to the Application
9  hyCase   = hyapp.ActiveDocument                         # Access to active document
10 hysolver = hyCase.Solver
11
12 LB=np.array([0.3000,0.7500,1.8750,4.6750,0.8590,2.5970,2.5410,3.9110])
13 UB=np.array([5.7000,14.2500,35.6250,88.8250,16.3210,49.3430,48.2790,74.3090])
14 x0 = (LB+UB)/2
15
16 > def hy_distinguish(hysolver): ...
31
32 > def hy_Object(hyCase, hysolver, variable): ...
104
105 # test run for center point
106 '''once you connect Aspen Hysys, just use hy_Object function for optimization'''
107 f_x0 = hy_Object(hyCase, hysolver, x0)
108 print('function output of x0 is: ',f_x0)
```

Just change x0 to your variable