

A dark blue vertical bar runs down the left side of the page. A blue arrow points to the right from this bar, containing the date.

1/10/2018

Autumn Group Data Warehouse Project

Manual – Version 3.0

Several thin, curved lines in dark blue and light grey originate from the bottom left and sweep upwards and to the right.

IT & Analytics Team
AUTUMN GROUP

What will be covered in the document?

1
IMPLEMENTATION

2
DATABASE
DESIGN

3
REPORTS

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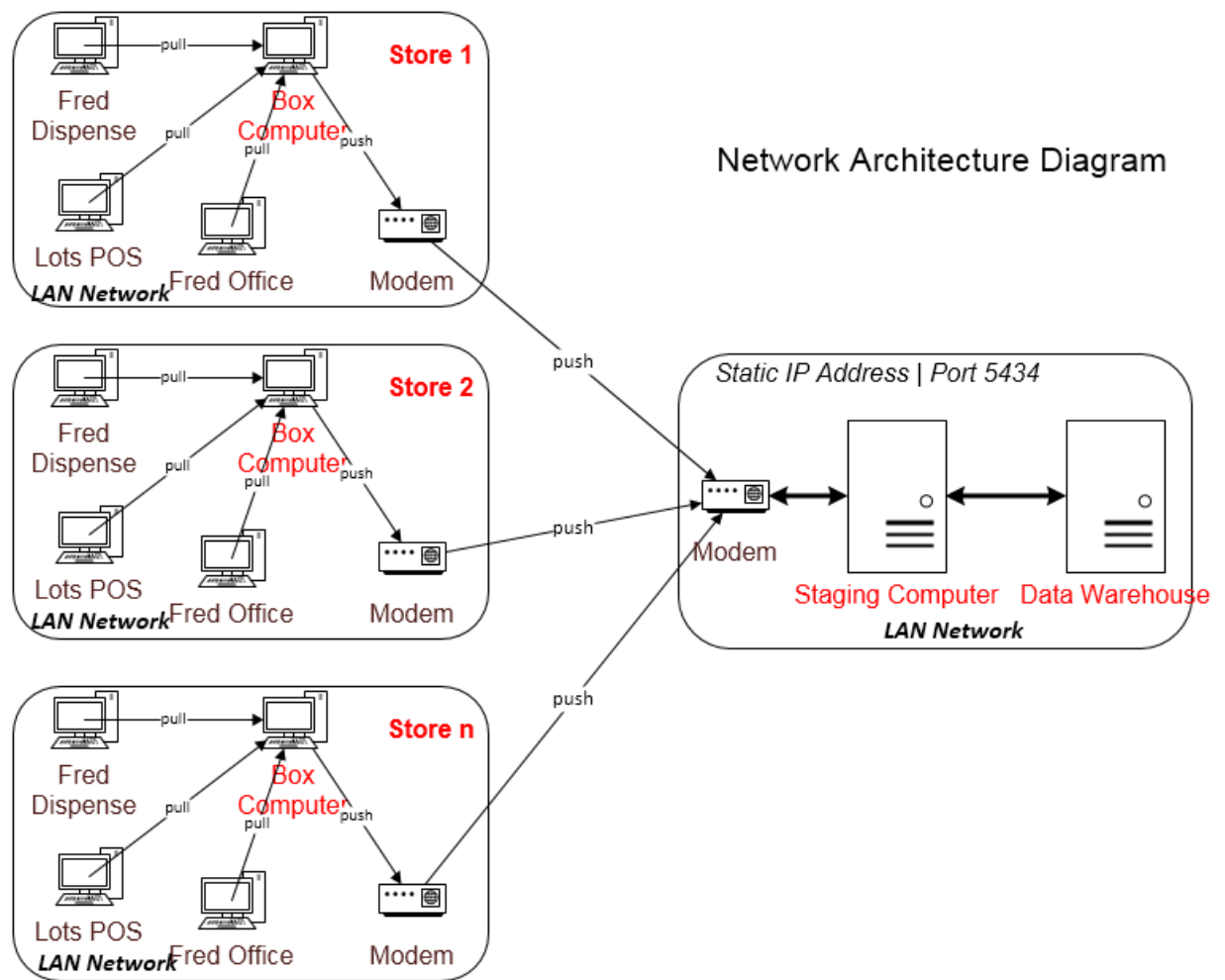
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I. IMPLEMENTATION

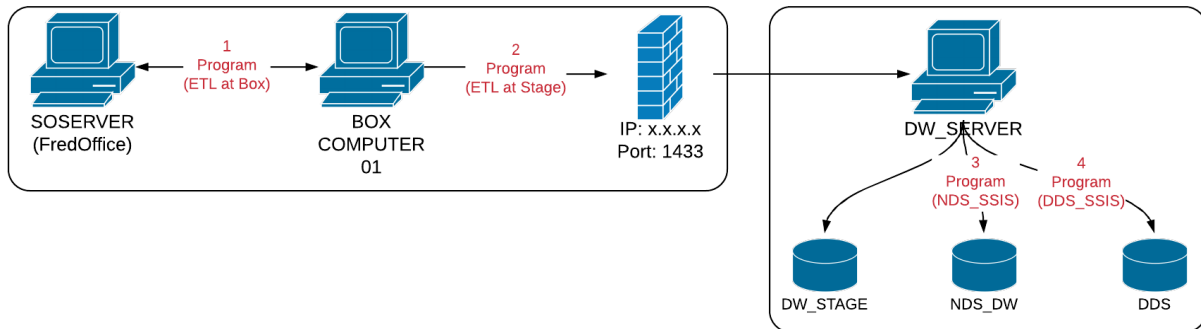
Network Design	An overview of data warehouse network. How data is transferred between applications at stores and server computers
Store Site	Store network. The computers in a store
Server Site	Local network. The server network design

I.1. Network Design



The diagram uses 3 stores as an example, but in realistic we can add in as many as we want

I.1.1.1. Data transferring



- 1) Box computer runs a program called “Extract Transfer Load (ETL) at Box” to pull out data from **SOSERVER**. The program *is scheduled every hour. After executing the program completes, data will be stored in Box Computer database and ready to transfer to Stage Computer*
- 2) Box computer runs another program called “ETL at Stage” to transfer data from Box computer to dw_stage in DW_SERVER via (*static ip address, port 5434*)
- 3) In DW_SERVER, The program called NDS_SSI (NDS: normalised data store, SSIS: SQL Server Integration Services) will be executed to clean data from dw_stage to nds_dw database
- 4) The DDS_SSI (DDS: dimensional data store) program is used to convert data from nds_dw to dds databases

I.1.2. Deployment Directory

Folder PATH listing for volume Windows
Volume serial number is 0000008B D83B:6536

```
C:.\
├── directory_tree.txt
├── SERVER SITE
│   ├── 1. DW_STAGE
│   ├── 2. NDS_DW
│   ├── 3. NDS_METADATA
│   ├── 4. SALE_DDS_DW
│   ├── 5. STOCK_VALUATION_DDS_DW
│   ├── 6. STAGE_To_NDS
│   ├── 7. NDS_To_DDS
│   └── 8. REPORTS
└── STORE SITE
    ├── 0. SP at BOX_COMPUTER
    ├── 1. BASH SCRIPTS
    ├── AutumnPlace
    ├── Brimbank
    ├── Pharmacy@Knox
    ├── Review - Linden
    ├── Review - Raymond
    ├── Review - TWKnox
    └── RisdonVale
```

I.2. Implementation at Server Site

At server site, we use only 1 physical computer named DW_SERVER

I.2.1. Network Set Up

Network configuration for Router / Modem

Device	Action	Value
<u>Router / Modem</u>	Open Port	5434
	Public IP Address	Static

<u>Firewall of DW SERVER</u>	Inbound Rules: create a new rule	Open port 5434 for public usage
------------------------------	---	--

I.2.2. SQL Server Installation

SQL Server 2014 Standard Edition will be installed at Server site

The tutorial for SQL Server installation is available in the link below, click the link then and then follow the instructions to server SQL Server Standard

(<https://social.technet.microsoft.com/wiki/contents/articles/23878.installing-sql-server-2014-step-by-step-tutorial.aspx>)

(*) However, the named instance in step 9, we use **AUTUMNGROUP** instead of SQL2014

After successfully installed, we need to update some properties as follow:

<i>Setup Protocols</i>	Protocols for AUTUMNGROUP -> TCP/IP -> Port 5434
<i>SQL Server</i>	Built-in Account -> Local Service
<i>SQL Server</i>	Start Mode: Automatic
<i>SQL Server Browser</i>	Log On -> Built-in account (Local Service) Service -> Start Mode -> Automatic
<i>Authentication</i>	Windows Authentication
<i>User Admin</i>	Disable “ sa ” user for security
<i>Remote User</i>	Create “ dw_user ” as public Mapping: ✓ DW_STAGE (Read&Write) ✓ NDS_METADATA (Read&Write)
<i>Make sure: they are running</i>	SQL Server SQL Server Browser SQL Server Integration

(**) The detail instruction to update properties is placed in Appendix section

I.2.3. Script Execution

After successfully installed SQL Server and created dw_admin user as sysadmin role. We double click on scripts (.sql) one-by-one for execution. You can find these scripts in the directory of Server Site

✓ 1. DW_STAGE

- ✓ 2. NDS_DW
- ✓ 3. NDS_METADATA
- ✓ 4. SALE_DDS_DW
- ✓ 5. STOCK_VALUATION_DDS_DW
- ✓ 8. REPORTS

I.3. Implementation at Store Site

In the prior setup, we have installed “dw_user” to all SOSERVER databases

I.3.1. Network Connection

We need to create 2 connections, please look at Appendix section “*how to create aliases in sql server*”:

- LS_STORE: connect to SOSERVER computer where we keep databases of Fred or Lots
- LS_STAGE: connect to DW_SERVER computer via the internet

I.3.2. SQL Server Installation

SQL Server 2014 Express Edition will be installed at BOX_COMPUTER

The tutorial for SQL Server installation is available in the link below, click the link then and then follow the instructions to server SQL Server Express

(<https://social.technet.microsoft.com/wiki/contents/articles/23878.installing-sql-server-2014-step-by-step-tutorial.aspx>)

(*) However, the named instance in step 9, we use **AUTUMNGROUP** instead of SQLEXPRESS2014

After successfully installed, some properties need to be updated:

<i>Setup Protocols</i>	Protocols for AUTUMNGROUP -> TCP/IP -> Port 5434
<i>SQL Server</i>	Built-in Account -> Local Service
<i>SQL Server</i>	Start Mode: Automatic
<i>SQL Server Browser</i>	Log On -> Built-in account (Local Service) Service -> Start Mode -> Automatic
<i>Authentication</i>	Windows Authentication

<i>User Admin</i>	Disable “sa” user for security Create “dw_box” as sysadmin role with default password: “AutumnGroup”
<i>Make sure: they are running</i>	SQL Server SQL Server Browser

I.3.3. Script Execution

In the directory of STORE SITE, we need to execute these scripts:

- ✓ generate_box_computer_db.sql
- ✓ metadata_autumnplace.sql (*)
- ✓ generate_db_users.sql
- ✓ generate_linkedserver_LS_STAGE.sql
- ✓ generate_linkedserver_LS_STORE.sql

(*): “autumnplace” is the name of store you are deploying. Depending on which store we deploy, we run scripts in that directory. Here, we deploy “Autumn Place pharmacy”, so we run scripts in AutumnPlace folder

After successfully executed, we need to **execute 2 programs** in “0. SP at BOX_COMPUTER” directory:

- ✓ v2_p_ETL_SourceToBox.sql
- ✓ v3_p_ETL_Box_Staging.sql

If the pharmacy uses LOTS, we will have to enable change tracking at SOSERVER. The detail and explanation are provided in Appendix

- ✓ enable_change_tracking.sql

II. DEPLOYMENT

II.1. Deployment at Server Site

Going to SSMS 2014, and follow the steps (*please check Appendix: how to create catalogs for SSIS for the detail*)

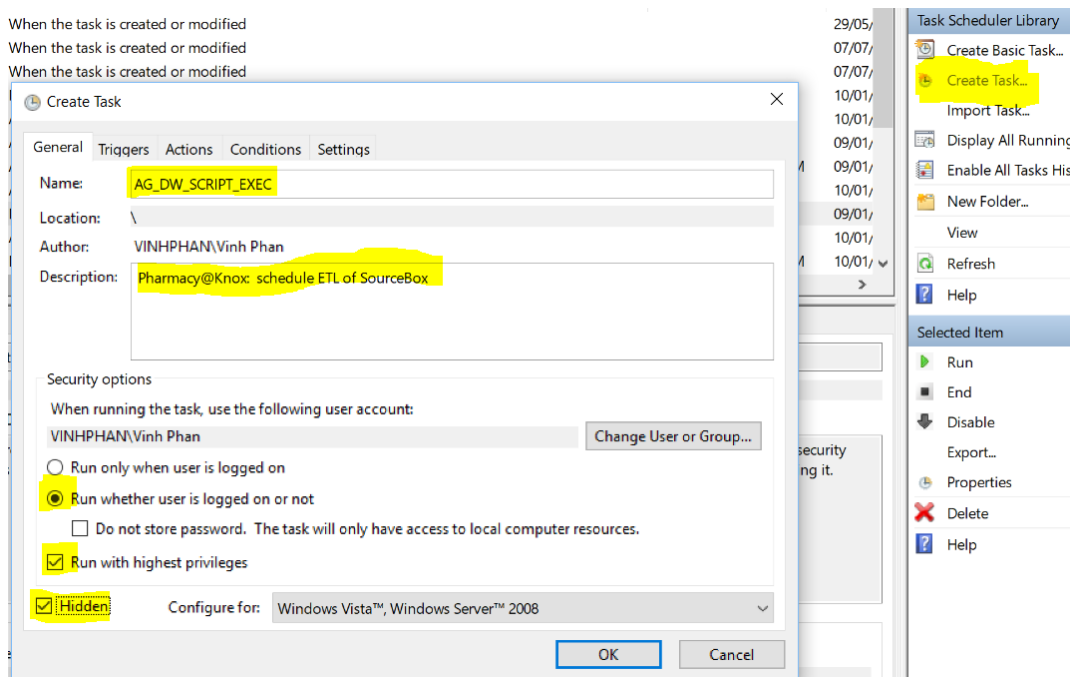
- ✓ **Step 1:** Create "Integration Services Catalogs"
- ✓ **Step 2:** Deploy SSIS Packages from Visual Studio 2013 to SSMS Catalogs

- Create 2 folder: first one is Stage_NDS, second one is NDS_DDS which contains DDSSales, DDSInventory

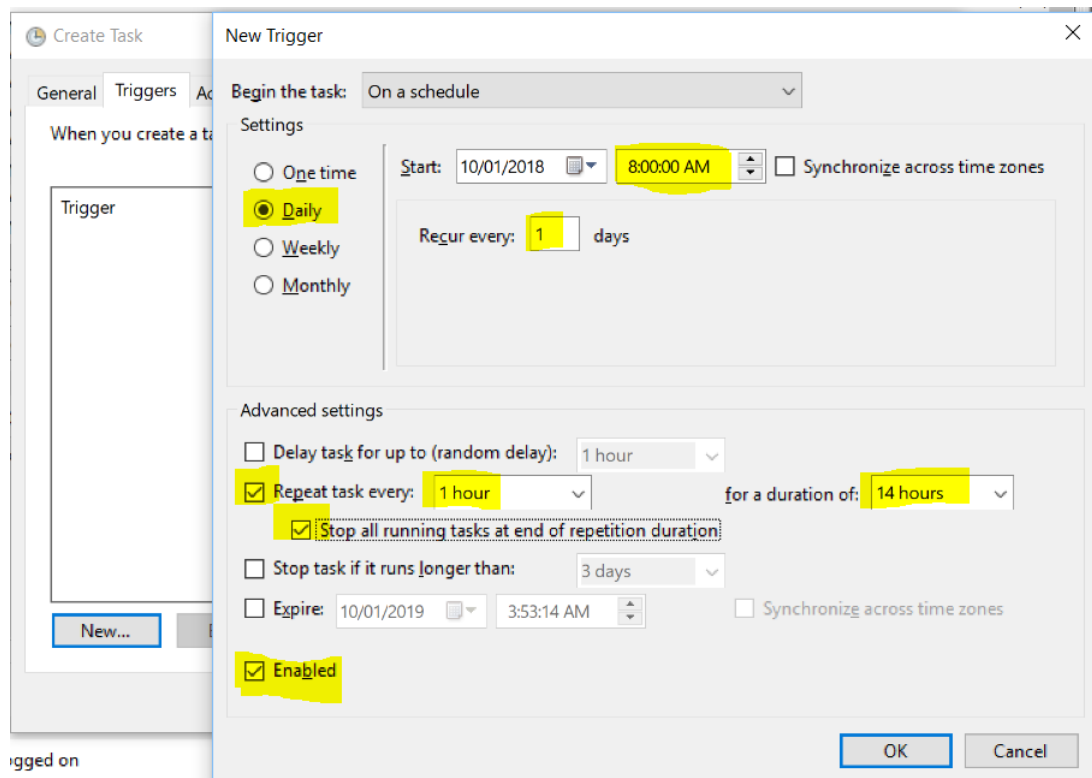
11.2. Deployment at Store Site

Going to directory Store Site, select the pharmacy needs to deploy. Here, we set schedule for Pharmacy@Knox as an example

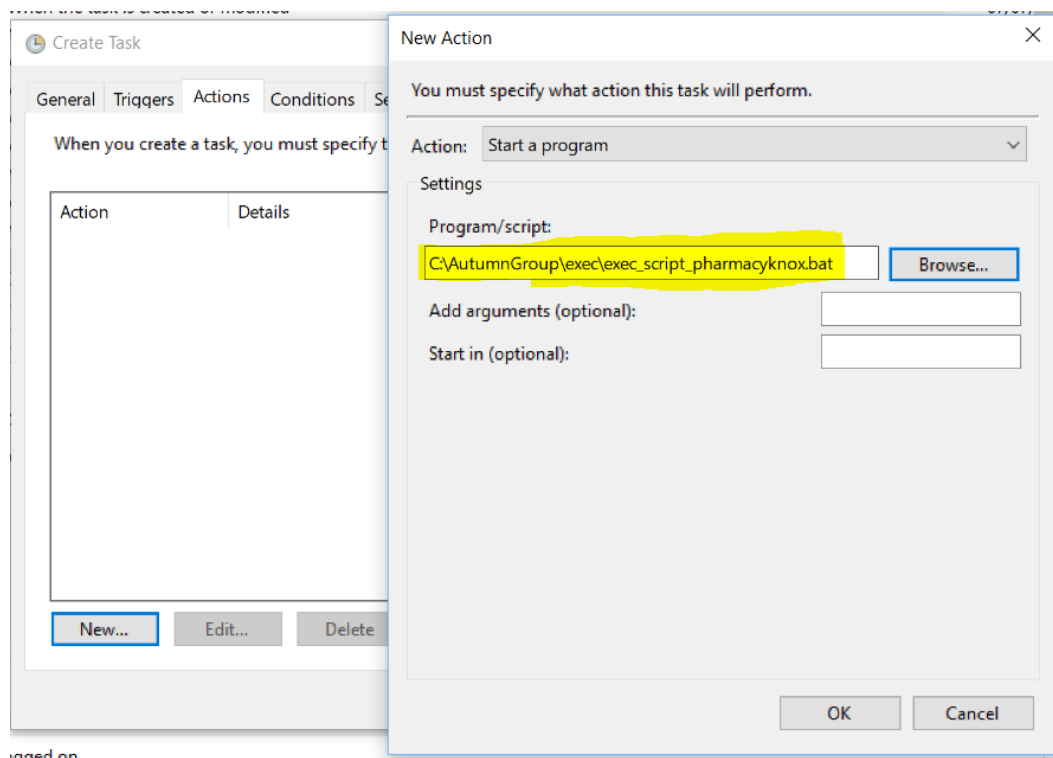
- ✓ **Step 1:** create folder “C:\AutumnGroup\exec” in Box_Computer
- ✓ **Step 2:** copy 2 files mentioned below to “exec” folder
 - exec_script_pharmacyknox.sql
 - exec_script_pharmacyknox.bat
- ✓ **Step 3:** open “Task Scheduler” in Control Panel, then create task, and follow the highlights



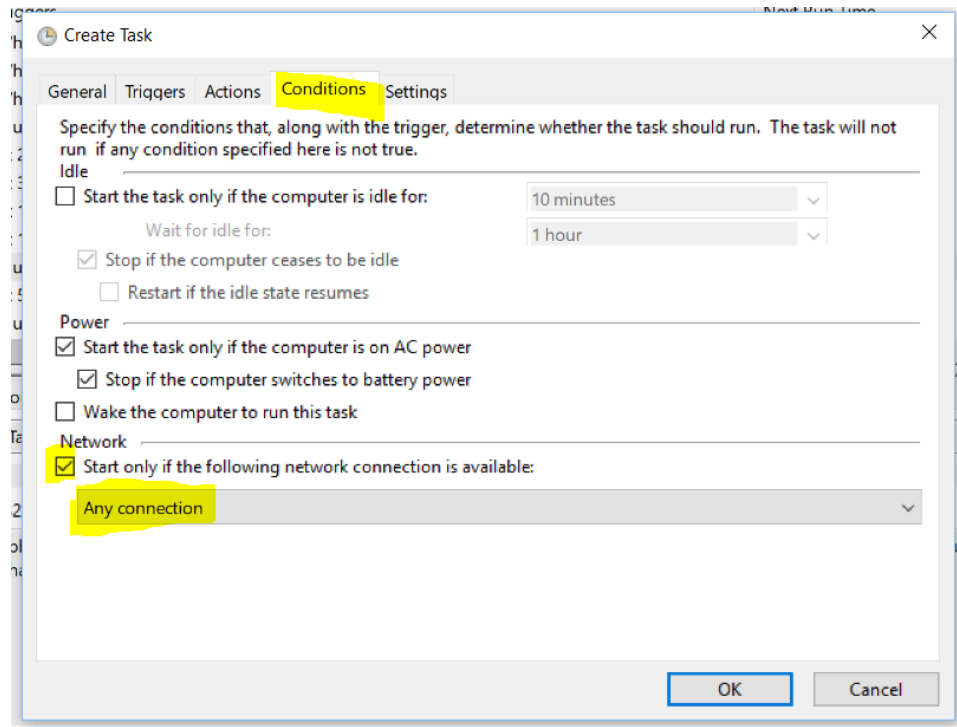
- ✓ **Step 4:** create new trigger, scheduling to run the scripts every hour between 8am and 10pm



- ✓ **Step 5:** in tab Actions, create new action, then browse to “*exec_script_pharmacyknox.bat*” picture attached



- ✓ **Step 6:** in tab Conditions, stick on “Start only if connection is available”



I. Computers Used in the Project

Store Name	Feature	Value
Terry White Knox	Computer Name	SOTILL14
	Domain	PHARMACY.local
	OS	Window 7 (32-bit)
	Memory	4gb
	Local IP	192.168.1.7
	Netmask	255.255.255.0
	Gateway	192.168.1.1
TW Brimbank	Computer 1	SOSERVER
	Access Method	Chrome Remote Connection
	Account	Autumn Office
	Computer 2	FREDCLIENT05
	Access Method	From SOSERVER, use Windows Desk Remote Connection
	User	Fred
	Password	Bb

III. DATABASE DESIGN

IV. REPORTS

IV.1. Fred Reports

I.1.1. Itemies Transaction Detail

❖ **Description:** we support “*view_itemies_transaction_detail.sql*” to generate all_data excel file which contains all items sold from the beginning to the latest update / ETL

❖ **Fields Supported in the report**

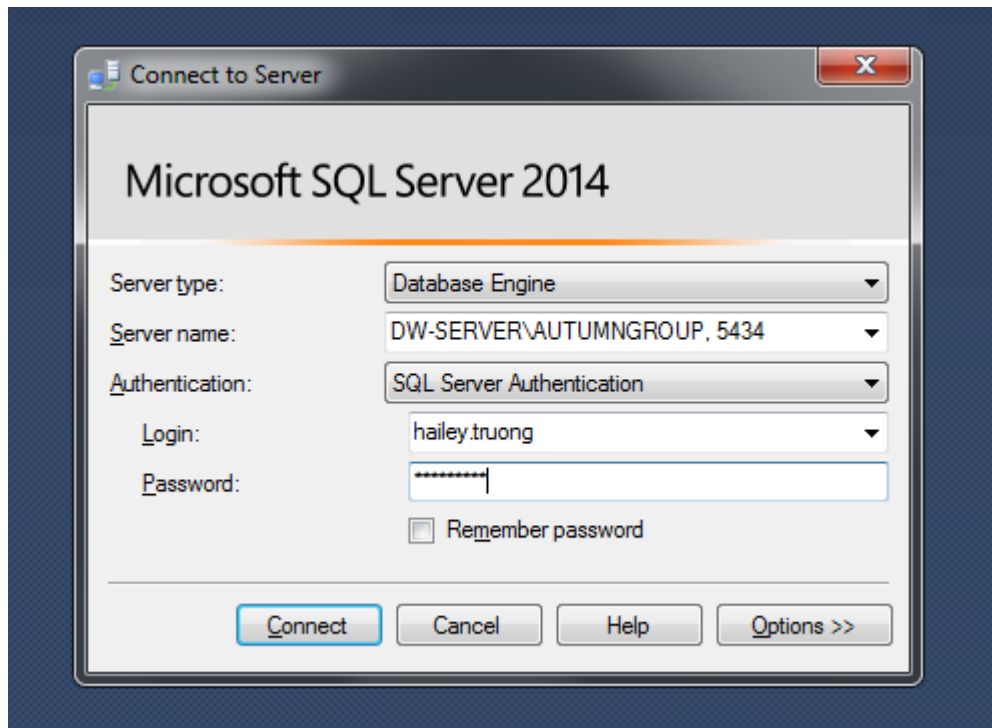
Fields	Full name	Description
TransactionEntryKey	Transaction Entry Key	The unique key over the pharmacies for each transaction entry
Transaction	Transaction Number	Not unique
Transaction_Date	Transaction date	
Transaction_Hour	Hour of that transaction	
Item_Description	Product name / Item name	
Department	Department name	
Category	Category name	
QtySold	Quantity sold	
Gov_Recov	Government recovery	
Tax	Tax	
Discount	Discount	
Profit		= Price – (Cost * QtySold) – Tax + Gov_Recov
Sales_Ex	Sales excluding tax	= Price - Tax
ScriptNumber_Fred	Script number in Fred	If we run report for Lots, ScriptNumber_Fred = 0
ScriptNumber_Lots	Script number in Lots	
Data_Source	Data source	Lots, FredOffice, FredPOS
StoreName	Store name	

I.1.2. Dispensed Script

I.1.3. Stock Valuation History

I.1.4. Update Wages & Rents into Central Database

- ✓ **Open SSMS application**
- ✓ **Connect to DW-SERVER computer**
 - **Connection** : DW-SERVER\AUTUMNGROUP, 5434
 - **Username** : hailey.truong
 - **Password** : 123456789



- ✓ Open **NDS_DW** database, edit "AG_GrossProfit_Wages_Rent"

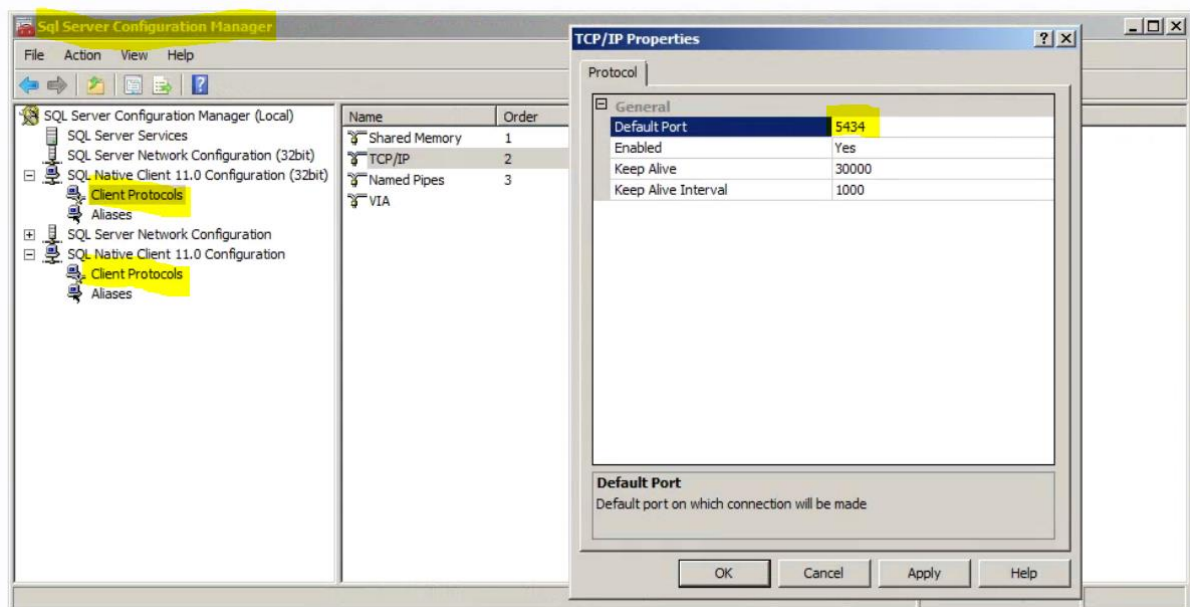
I.1.5. Stock Valuation History

I.1.6. Stock Valuation History

IV.2. Lots Reports

APPENDIX

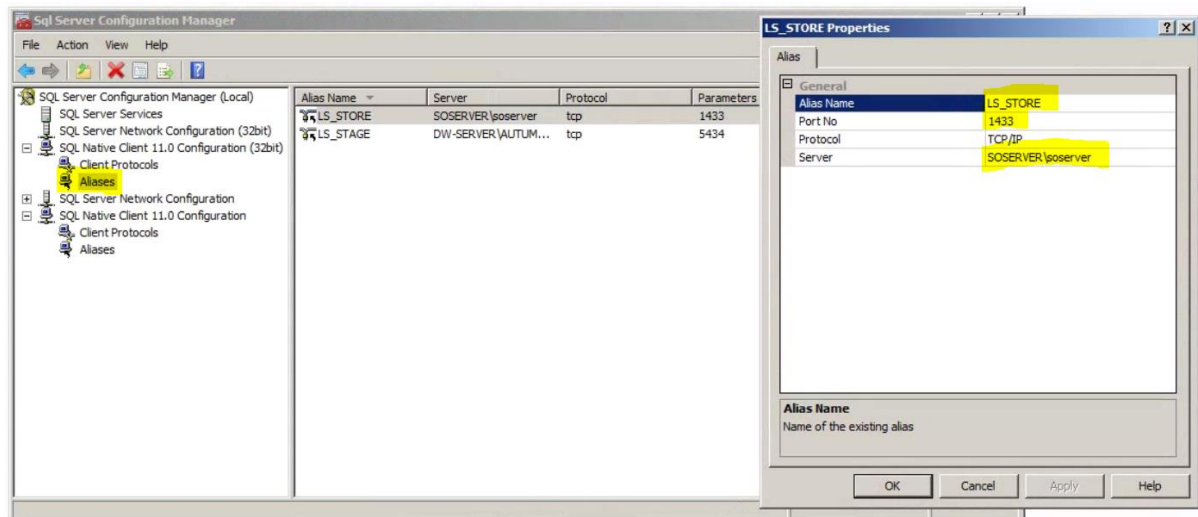
❖ How to setup protocols in SQL Server Configuration



- Go to "Sql Server Configuration Manager"
- In SQL Native Client 11.0 Configuration -> Client Protocols -> TCP/IP
 - o Change Default Port 1433 to 5434
 - o OK
- Similarly, we change default port in SQL Native Client 11.0 Configuration (32 bit)

❖ How to create Aliases in SQL Server Configuration

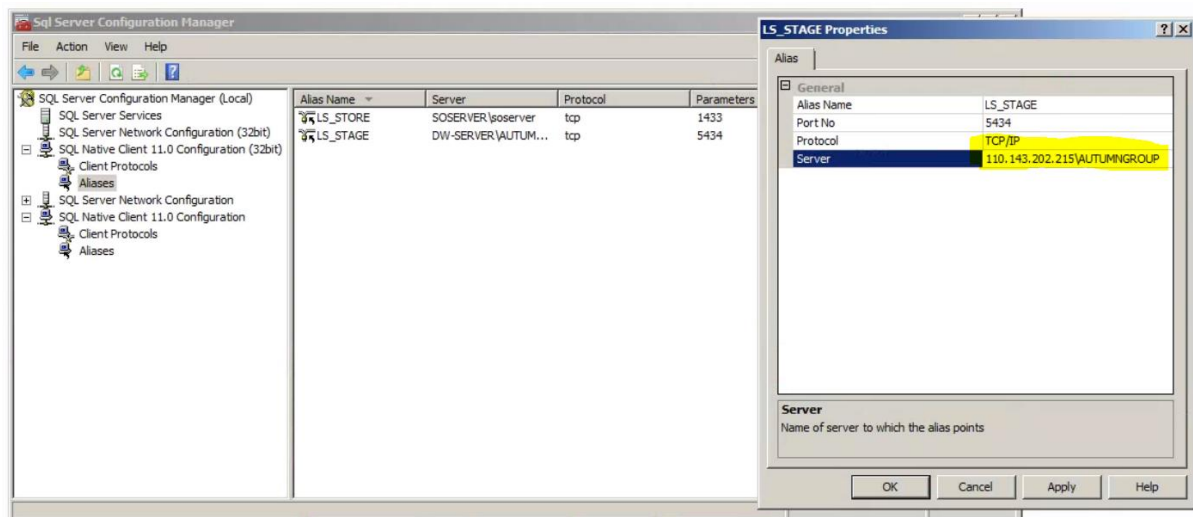
- The objective is to create alias connection to another computer



- Go to “Sql Server Configuration Manager”
- In SQL Native Client 11.0 Configuration -> Aliases
 - o Right click to create new Alias
 - o Specify Alias Name, Port No, and Server address
- In data warehouse project, we have to create 2 aliases, namely
 - o LS_STORE
 - Port: 1433
 - Server: SOSERVER\soserver (*)
 - o LS_STAGE
 - Port: 5434
 - Server: <dw_server static ip>\AUTUMNGROUP (**)
- Do it again for SQL Native Client 11.0 Configuration (32 bit)

(*): depends on server name in pharmacy, here I use SOSERVER as a default server name

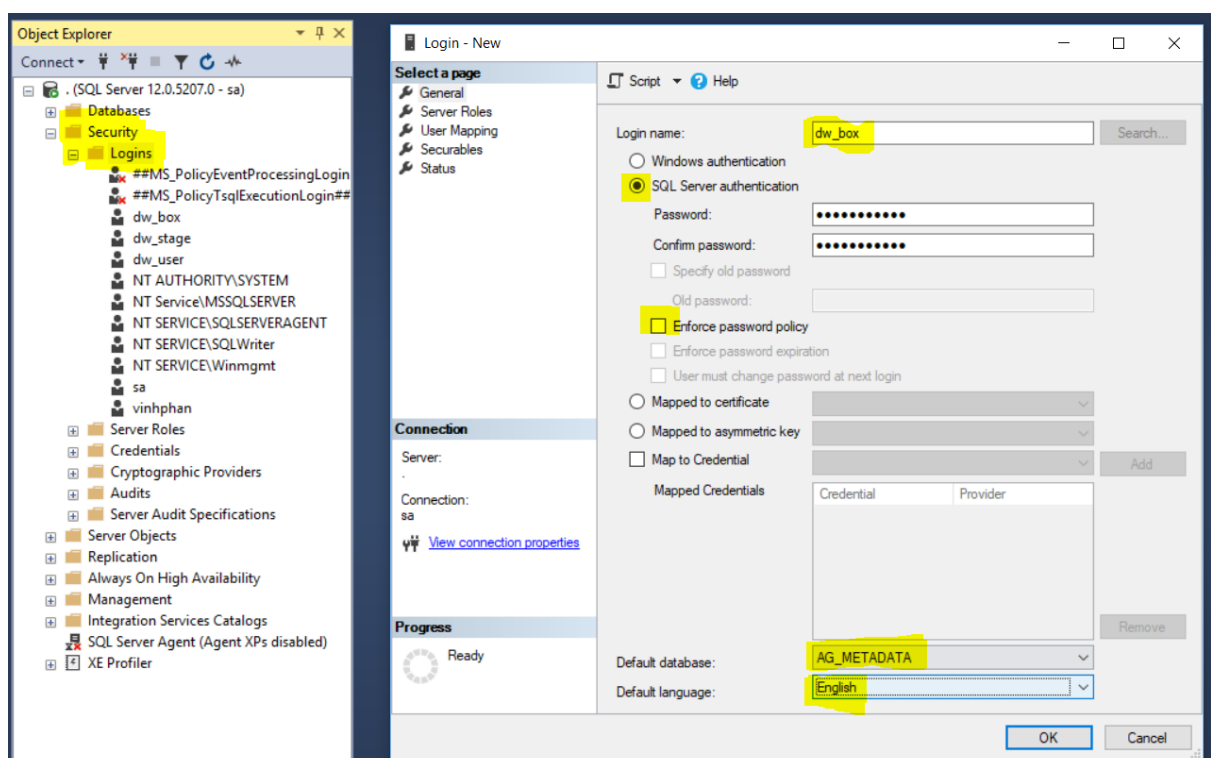
(**): <dw_server static ip> is **110.143.202.215**



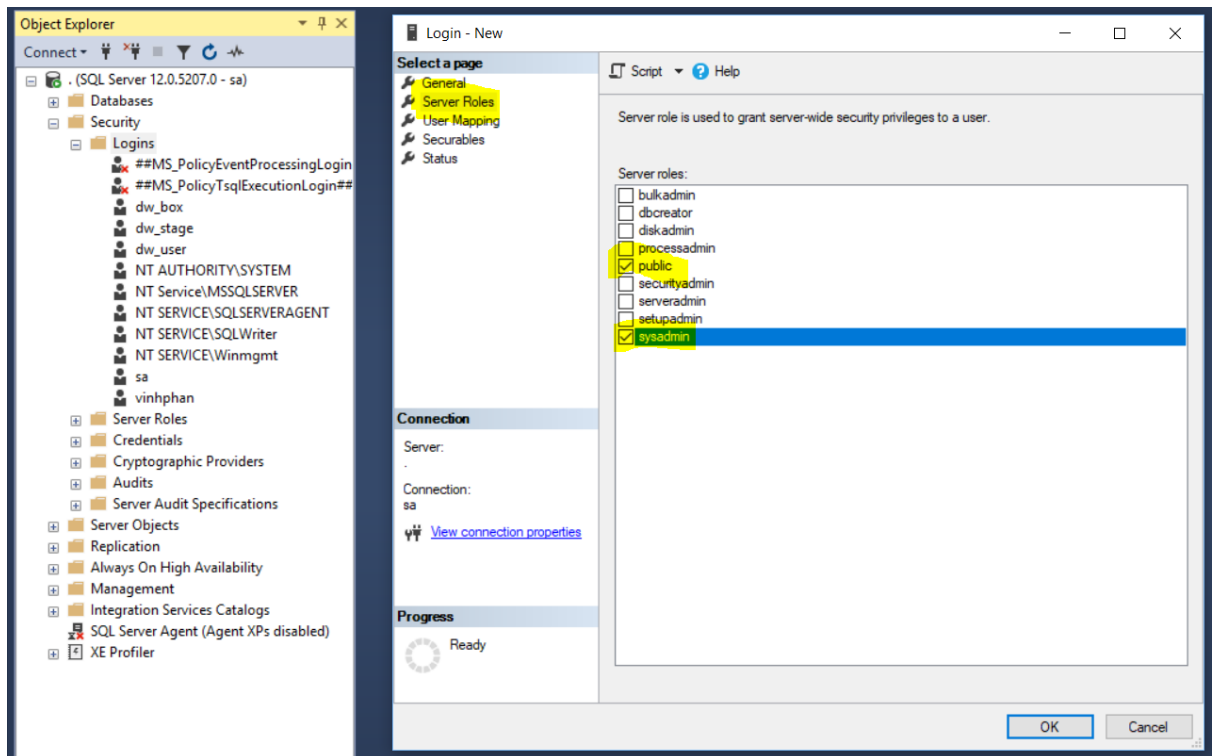
❖ How to create a new user in SQL Server DB

We will create “dw_box” user at Box_Computer. All highlights in photos need to be changed

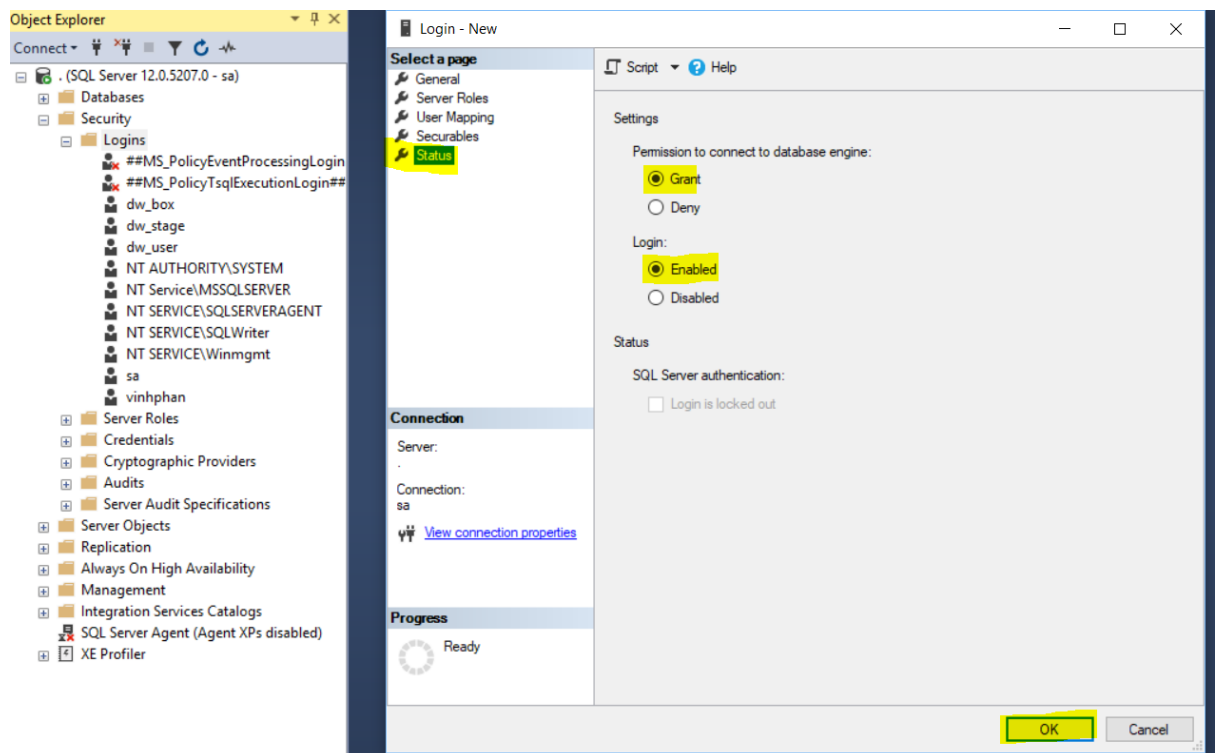
1. Step 1: right-click on Logins -> new login. Enter login name, password, unstick enforce password, change default database



2. Step 2: in the left sidebar, stick on public and **sysadmin** (admin permission in a database)



3. Step 3: move to status, permission – grant, Login – enabled, then click okay to finish



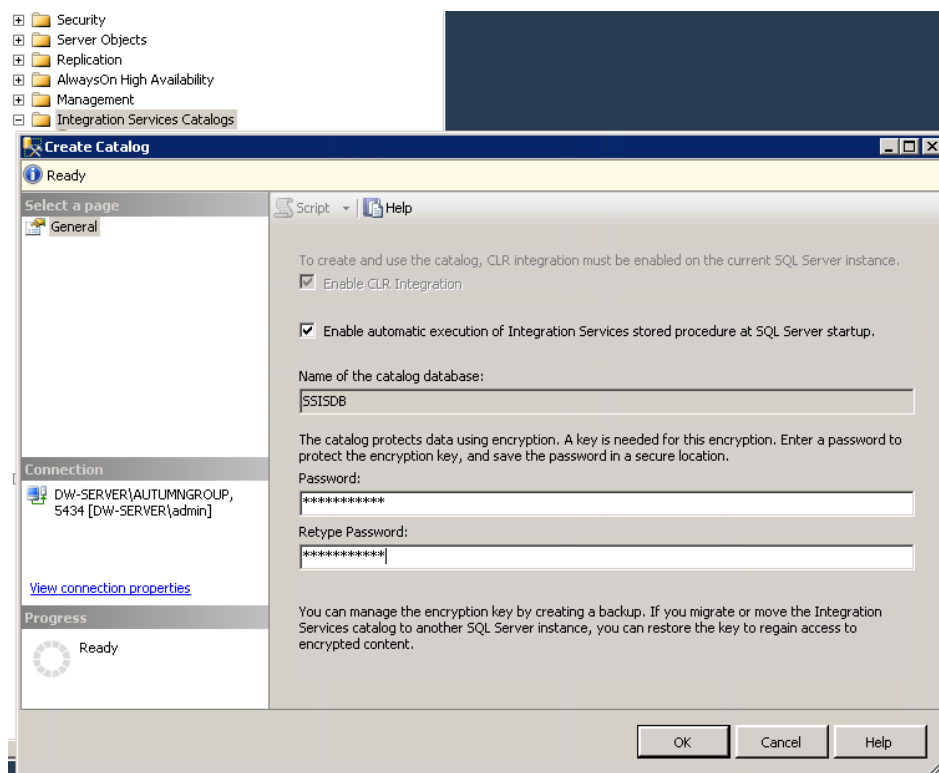
❖ How to create Integration Services Catalogs in SSMS

IMPORTANT:

- ✓ It's recommended that we should use relevant SSMS version with SQL Server Instance. Particularly, we use SSMS 2014, and SQL Server 2014
- ✓ Also, we have to install SSDTBI (Business Intelligence Tools) for Visual Studio 2013

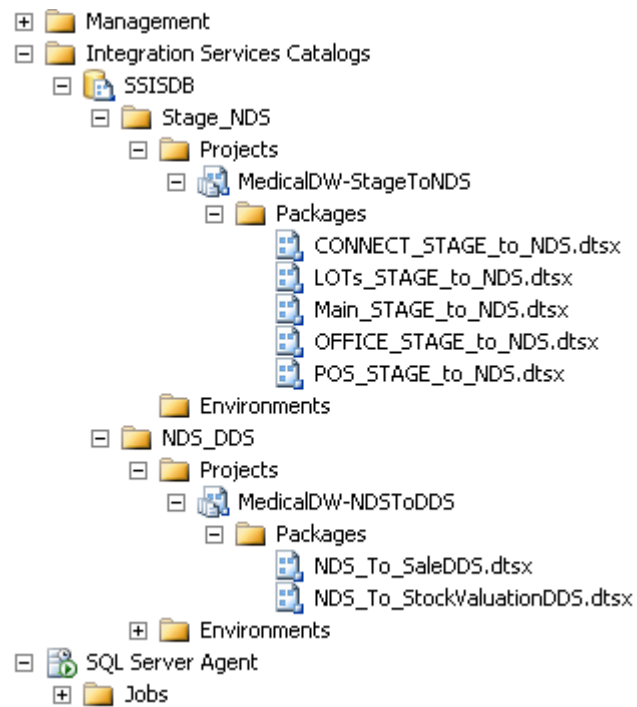
Installation

- ✓ Right click on "Integration Services Catalogs"
- ✓ Check "Enable automate execution..."
- ✓ Fill in the password (Default: AutumnGroup)
- ✓ OK



After that it will create a SSISDB database in your instance

- ✓ We need to create 2 folders (Stage_NDS, NDS_DDS)
- ✓ Then we run Visual Studio to deploy 2 projects into those folders respectively
- ✓ The outcome should look like this



❖ How to create scheduled jobs with SQL Server Agent

❖ How to

❖ How to