Windows Service Using C#

WEEK 04

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Windows Services

- A Windows service is a long-running program
- It is designed to run as a background task with no interaction with the screen
- UNIX calls these processes daemons
- They often implement key system tasks such as
  - Anti Virus
  - Indexing
  - DNS
  - time synchronization
  - SSH
  - HTTP
  - IIS, etc.

Windows Services

Configurable

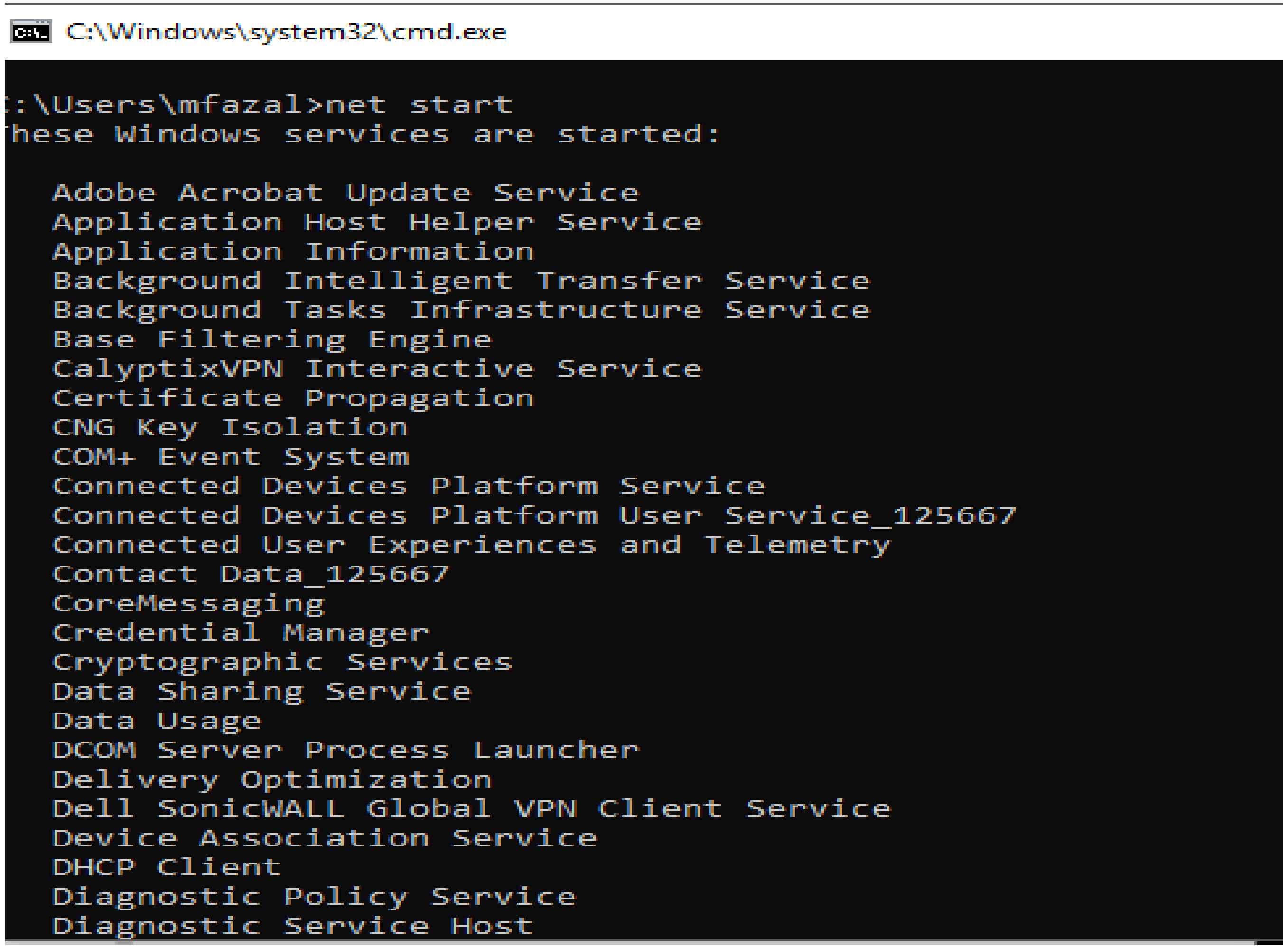
- Runs on startup (computer boot)
- Delay Run
- Manual / Auto Run
- Start with parameter
- Starts for specific username

View Windows Services

- Command Prompt
- Task Manager
- Services Manager
- Computer Manager

View Windows Services – Command Prompt

- C:\> net start

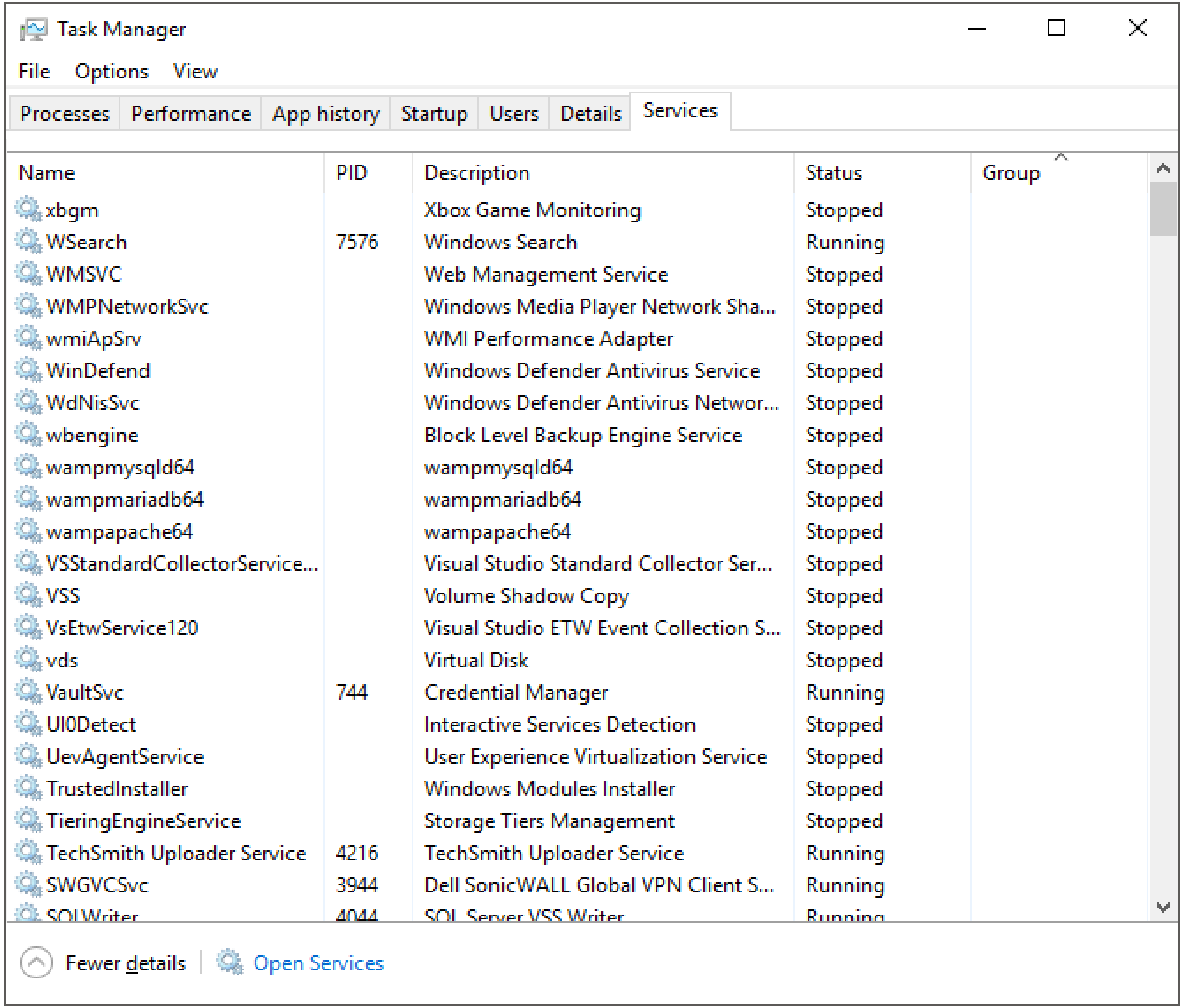


C:\Windows\system32\cmd.exe

```
:\Users\mfazal>net start
hese Windows services are started:

   Adobe Acrobat Update Service
   Application Host Helper Service
   Application Information
   Background Intelligent Transfer Service
   Background Tasks Infrastructure Service
   Base Filtering Engine
   CalyptixVPN Interactive Service
   Certificate Propagation
   CNG Key Isolation
   COM+ Event System
   Connected Devices Platform Service
   Connected Devices Platform User Service_125667
   Connected User Experiences and Telemetry
   Contact Data_125667
   CoreMessaging
   Credential Manager
   Cryptographic Services
   Data Sharing Service
   Data Usage
   DCOM Server Process Launcher
   Delivery Optimization
   Dell SonicWALL Global VPN Client Service
   Device Association Service
   DHCP Client
   Diagnostic Policy Service
   Diagnostic Service Host
```

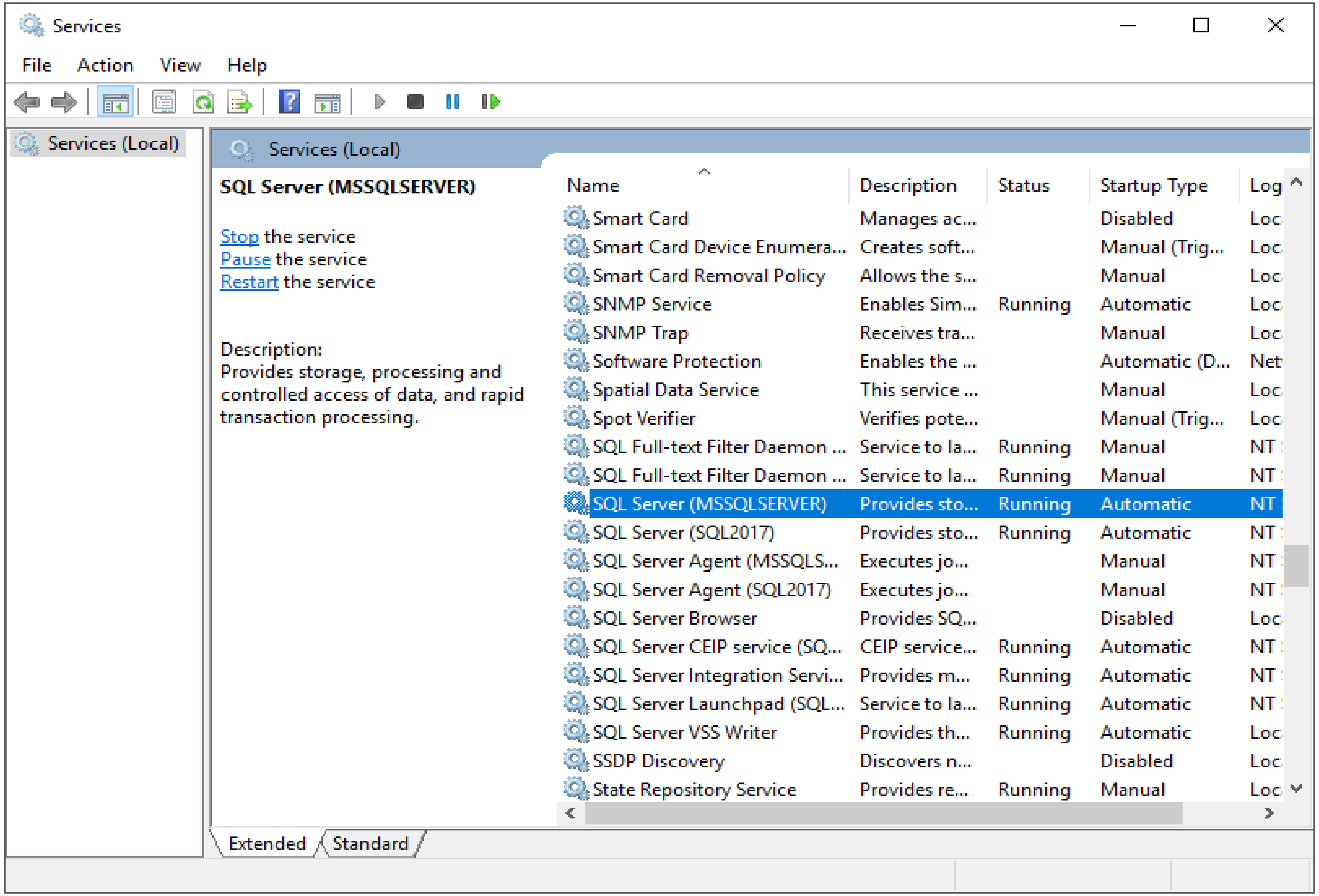
View Windows Services – Task Manager



Name	PID	Description	Status	Group
xbgm		Xbox Game Monitoring	Stopped	
WSearch	7576	Windows Search	Running	
WMSVC		Web Management Service	Stopped	
WMPNetworkSvc		Windows Media Player Network Sha...	Stopped	
wmiApSrv		WMI Performance Adapter	Stopped	
WinDefend		Windows Defender Antivirus Service	Stopped	
WdNisSvc		Windows Defender Antivirus Networ...	Stopped	
wbengine		Block Level Backup Engine Service	Stopped	
wampmysqld64		wampmysqld64	Stopped	
wampmariadb64		wampmariadb64	Stopped	
wampapache64		wampapache64	Stopped	
VSStandardCollectorService...		Visual Studio Standard Collector Ser...	Stopped	
VSS		Volume Shadow Copy	Stopped	
VsEtwService120		Visual Studio ETW Event Collection S...	Stopped	
vds		Virtual Disk	Stopped	
VaultSvc	744	Credential Manager	Running	
UI0Detect		Interactive Services Detection	Stopped	
UevAgentService		User Experience Virtualization Service	Stopped	
TrustedInstaller		Windows Modules Installer	Stopped	
TieringEngineService		Storage Tiers Management	Stopped	
TechSmith Uploader Service	4216	TechSmith Uploader Service	Running	
SWGVCSvc	3944	Dell SonicWALL Global VPN Client S...	Running	
SQLWriter	4044	SQL Server VSS Writer	Running	

View Windows Services – Services Manager

- Run -> Services.msc



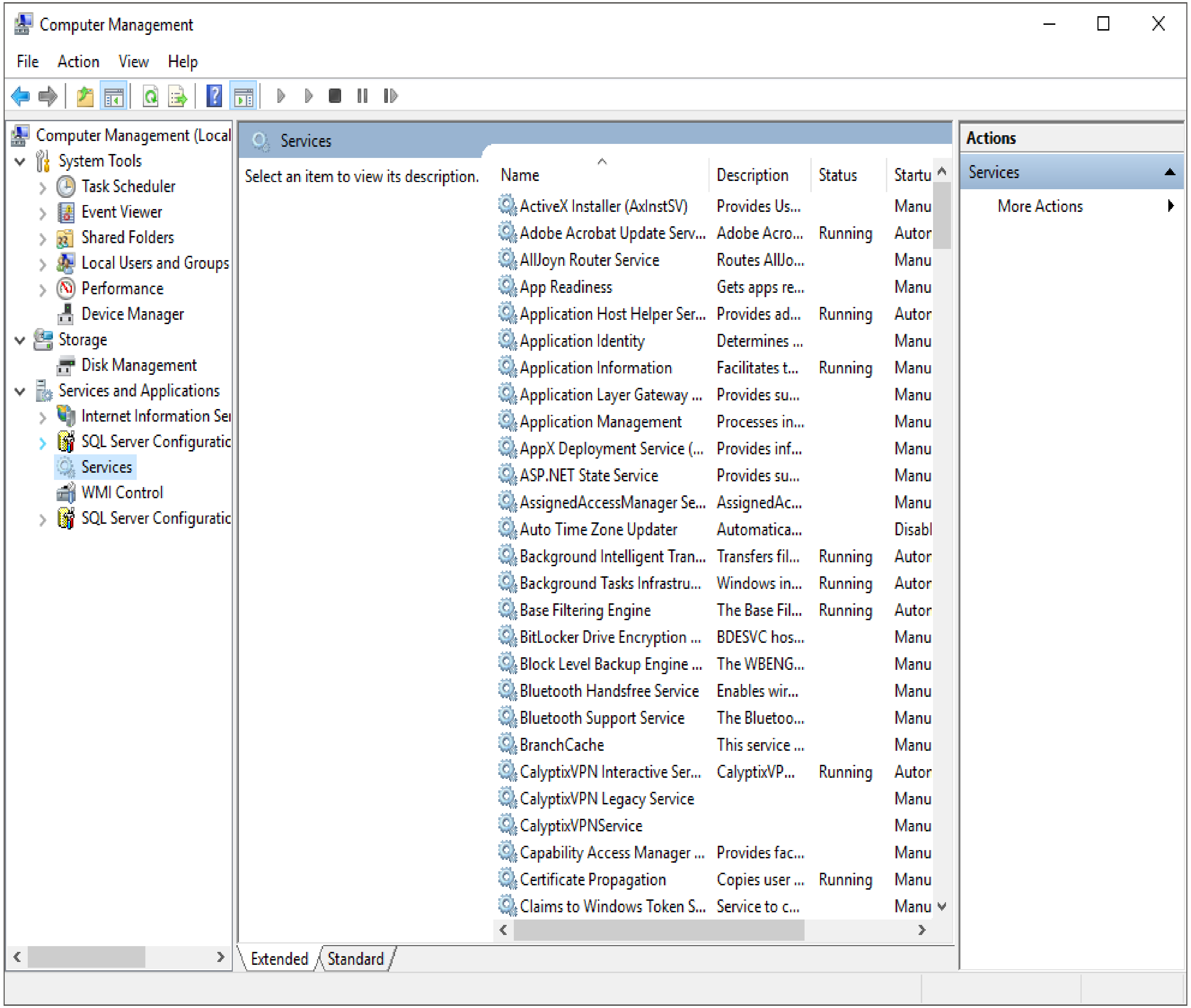
SQL Server (MSSQLSERVER)

Stop the service
Pause the service
Restart the service

Description:
Provides storage, processing and controlled access of data, and rapid transaction processing.

Name	Description	Status	Startup Type	Log
Smart Card	Manages ac...		Disabled	Loc
Smart Card Device Enumera...	Creates soft...		Manual (Trig...	Loc
Smart Card Removal Policy	Allows the s...		Manual	Loc
SNMP Service	Enables Sim...	Running	Automatic	Loc
SNMP Trap	Receives tra...		Manual	Loc
Software Protection	Enables the ...		Automatic (D...	Net
Spatial Data Service	This service ...		Manual	Loc
Spot Verifier	Verifies pote...		Manual (Trig...	Loc
SQL Full-text Filter Daemon ...	Service to la...	Running	Manual	NT
SQL Full-text Filter Daemon ...	Service to la...	Running	Manual	NT
SQL Server (MSSQLSERVER)	Provides sto...	Running	Automatic	NT
SQL Server (SQL2017)	Provides sto...	Running	Automatic	NT
SQL Server Agent (MSSQLS...	Executes jo...		Manual	NT
SQL Server Agent (SQL2017)	Executes jo...		Manual	NT
SQL Server Browser	Provides SQ...		Disabled	Loc
SQL Server CEIP service (SQ...	CEIP service...	Running	Automatic	NT
SQL Server Integration Servi...	Provides m...	Running	Automatic	NT
SQL Server Launchpad (SQL...	Service to la...	Running	Automatic	NT
SQL Server VSS Writer	Provides th...	Running	Automatic	Loc
SSDP Discovery	Discovers n...		Disabled	Loc
State Repository Service	Provides re...	Running	Manual	Loc

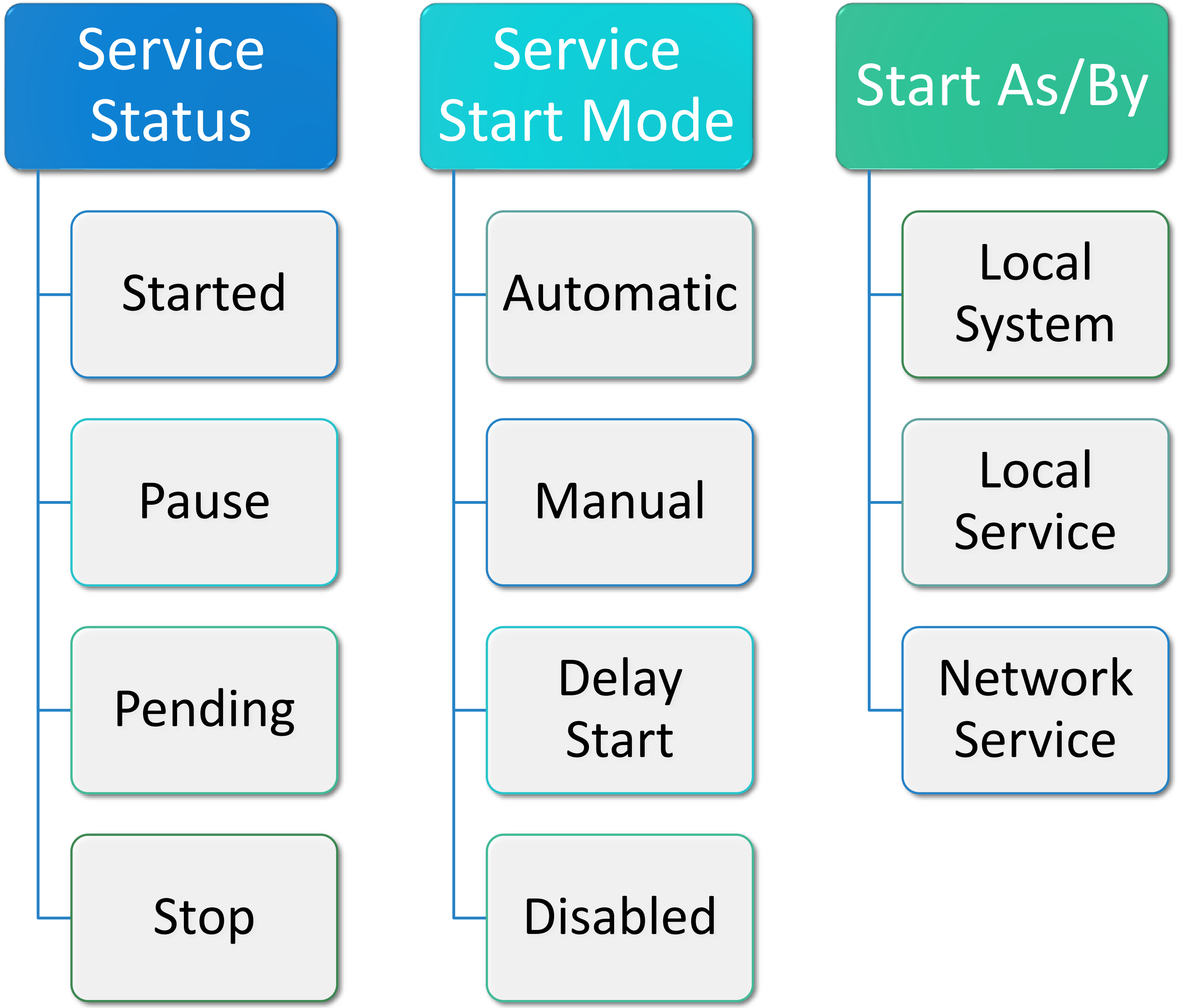
View Windows Services – Computer Manager



Select an item to view its description.

Name	Description	Status	Startu
ActiveX Installer (AxInstSV)	Provides Us...		Manu
Adobe Acrobat Update Serv...	Adobe Acro...	Running	Autor
AllJoyn Router Service	Routes AllJo...		Manu
App Readiness	Gets apps re...		Manu
Application Host Helper Ser...	Provides ad...	Running	Autor
Application Identity	Determines ...		Manu
Application Information	Facilitates t...	Running	Manu
Application Layer Gateway ...	Provides su...		Manu
Application Management	Processes in...		Manu
AppX Deployment Service (...	Provides inf...		Manu
ASP.NET State Service	Provides su...		Manu
AssignedAccessManager Se...	AssignedAc...		Manu
Auto Time Zone Updater	Automatica...		Disabl
Background Intelligent Tran...	Transfers fil...	Running	Autor
Background Tasks Infrastru...	Windows in...	Running	Autor
Base Filtering Engine	The Base Fil...	Running	Autor
BitLocker Drive Encryption ...	BDESVC hos...		Manu
Block Level Backup Engine ...	The WBENG...		Manu
Bluetooth Handsfree Service	Enables wir...		Manu
Bluetooth Support Service	The Bluetoo...		Manu
BranchCache	This service ...		Manu
CalyptixVPN Interactive Ser...	CalyptixVP...	Running	Autor
CalyptixVPN Legacy Service			Manu
CalyptixVPNService			Manu
Capability Access Manager ...	Provides fac...		Manu
Certificate Propagation	Copies user ...	Running	Manu
Claims to Windows Token S...	Service to c...		Manu

Understanding Windows Services



Service Status

- Started
- Pause
- Pending
- Stop

Service Start Mode

- Automatic
- Manual
- Delay Start
- Disabled

Start As/By

- Local System
- Local Service
- Network Service

ServiceBase Class

- The ServiceBase class is in the System.ServiceProcess namespace
- All services are derived from this class
- It provides several methods which should be overloaded to define the actions of the service

ServiceBase Methods

void OnStart(string[] args)

- This is sent by the system when the service is started
- Normally, the work performed by the service will be done by this method

void OnPause()

- Called when the service is paused
- A service is usually resumed after a pause and it is not necessary to release all resources held by the service

ServiceBase Methods

void OnContinue()

- This resumes normal processing after the service has been paused

void OnStop()

- This attempts to stop the service
- The service might be started again at a later time

ServiceBase Properties

ServiceName

- Allows the name of the service to be set or retrieved

CanStop

- Boolean indicating whether the service can be stopped

Sample Service

We will now write a sample service

We must provide

- A service
- A main program for the service
- A service installer

Our sample service will periodically write the time to a file

Service1

The constructor

```
 public Service1()
 {
      InitializeComponent();
      this.ServiceName = "WindowsService1";
 }
```

Service1

```
protected override void OnStart(string[] args)
{
      try
      {
        writer = File.CreateText(@"c:\service1.log");
        timer = new System.Threading.Timer(new
          System.Threading.TimerCallback(TimerHandler),
          null, 1000, 10000);
      }
      catch (Exception e1)
      {
      }
}
```

Service1

```
protected override void OnStop()
{
        if (writer != null)
        {
          try
          {
            writer.Close();
            writer = null;
          }
          catch (Exception e2)
          {
          }
        }
}
```

Service1

```
void TimerHandler(object info)
{
      if (writer != null)
      {
        writer.WriteLine("It is now {0}",
                DateTime.Now);
      }
}
```

Main

Every service must have a Main method to run the service

```
static void Main()
{
        ServiceBase[] ServicesToRun;

          ServicesToRun = new ServiceBase[] { new Service1()
 };

        ServiceBase.Run(ServicesToRun);
}
```

Installing the Service

- Before you can install the service, you must write an installer
- This extends System.Configuration.Install.Installer
- It is included in the same assembly as the service it should install
- It installs the service by using the service name, which must be set in the service

Installing / Uninstall the Service

To install the service use installutil which is located in

- C:\WINDOWS\Microsoft.NET\Framework\<version>

To uninstall the service, use installutil /u <service.exe>

Installing the Service

To install the service

- Start a command prompt and go to the directory containing the service assembly
- installutil WindowsService1.exe

To start the service

- Start the services control panel and click start

To uninstall the service

- installutil /u WindowsService1.exe

Windows Service v/s Task Scheduler

Windows Service	Task Scheduler
Running a permanent or continuous operation/ task	Running a program/app once in a while (on frequency basis)
When a service is required to provide data/operation when needed/triggered	Running at its own pace. Process and provide output but does not dependent on other program/input
Complex program and/or application that is very complex in coding and processing	Simple operation or program that can be easily managed
Triggered via events or programs	Triggered via time