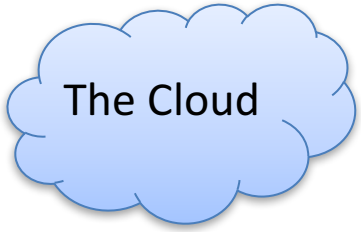
2017.03.02

Microsoft Azure

Cloud Computing and Hosting

Hans-Petter Halvorsen



Cloud Hosting and Services

Hans-Petter Halvorsen, M.Sc.

Cloud Computing and Hosting Providers

They rent Cloud based services like Virtual Machines (Computers with OS running in the Cloud), Web Server, Database Systems to Customers based on Monthly Fees

Deployment

Deployment of Databases, Web Sites, Web Apps, Web Services, etc.

Hans-Petter Halvorsen, M.Sc.

What is Deployment?

Software deployment is all of the activities that make a software system available for use.

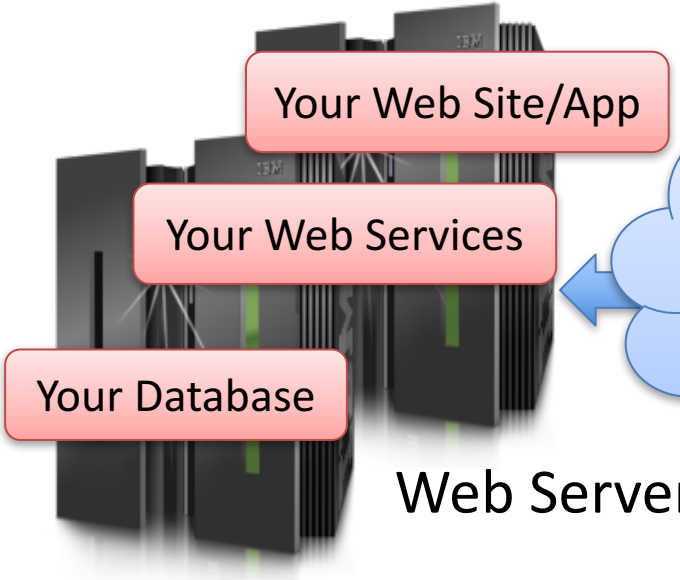
Examples:

- Get the software out to the customers
- Creating Installation Packages
- Documentation
  - Installation Guide, etc.
- Installation
- etc.

Deployment strategies may vary depending of what kind of software we create, etc. (e.g. Desktop App vs. Web Site)

Deployment

Server-side Software



Your Web Site/App

Your Web Services

Your Database

Web Servers

Database Servers

The Cloud/
Internet/
Local Network

Client-side Software

PCs

Deployment of different types of Apps

Databases

Web Servers

Services and Applications

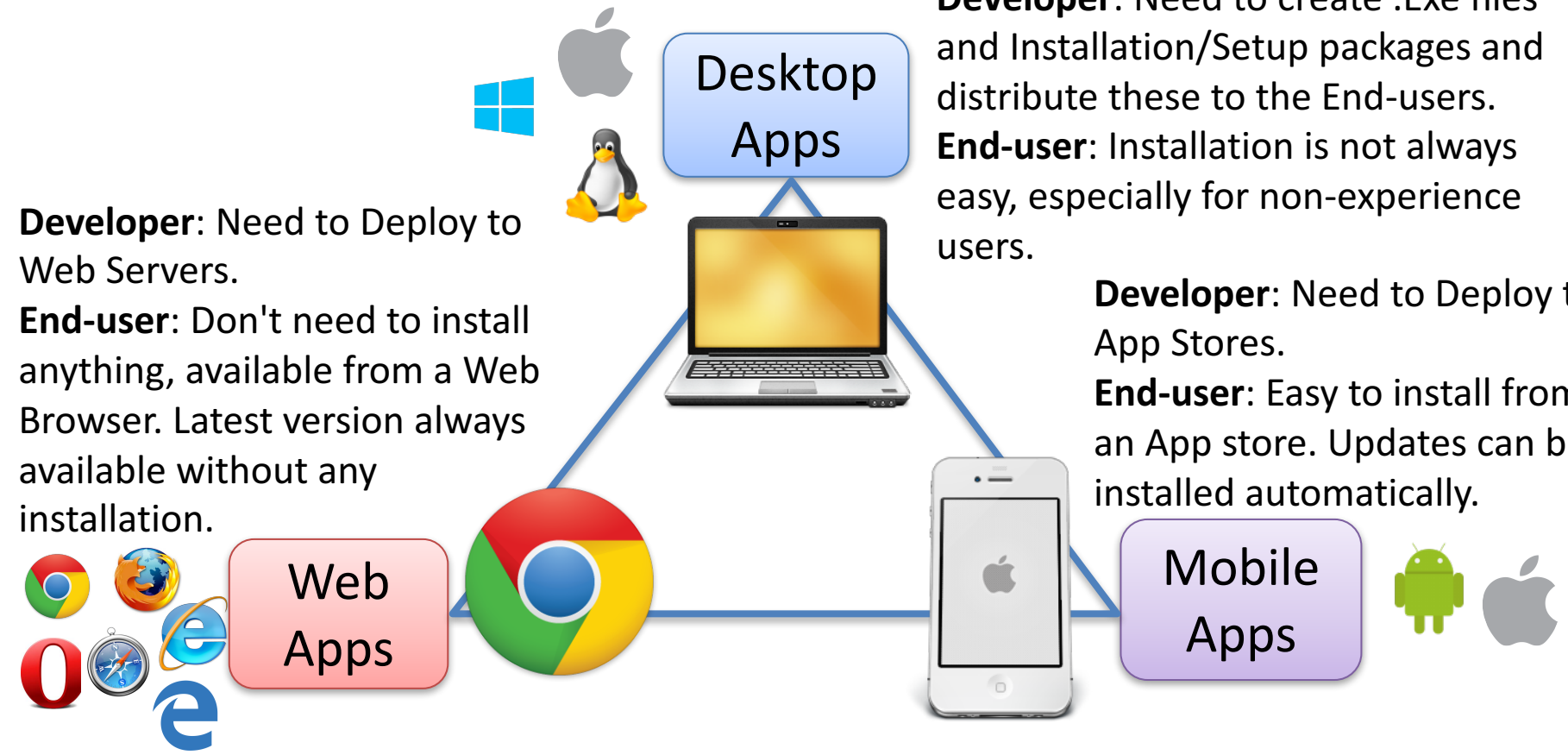
Cloud Services

Web Apps

Mobile Apps

Desktop Apps

Deployment on different Platforms

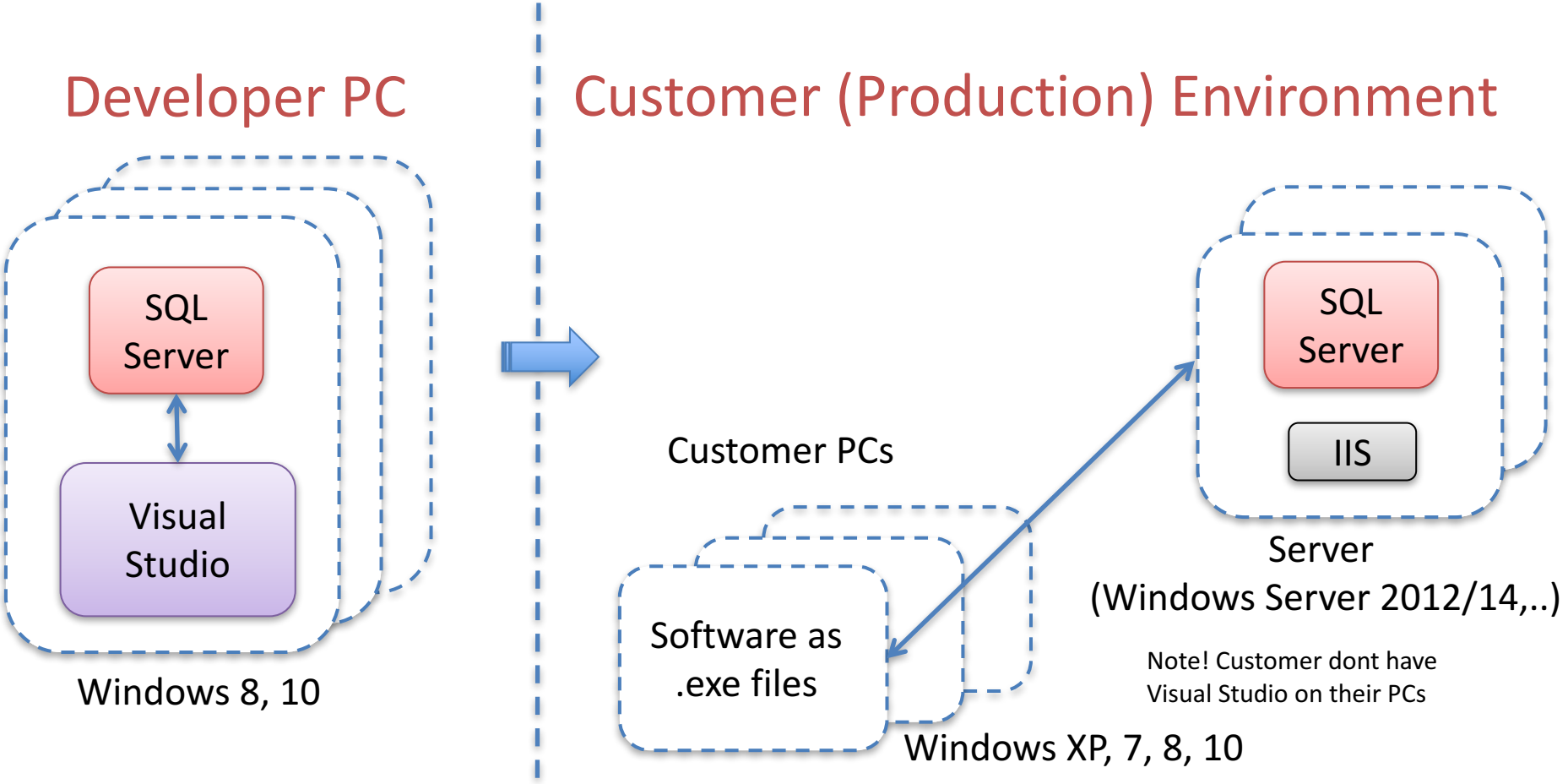


Developer: Need to create .Exe files and Installation/Setup packages and distribute these to the End-users.
End-user: Installation is not always easy, especially for non-experience users.

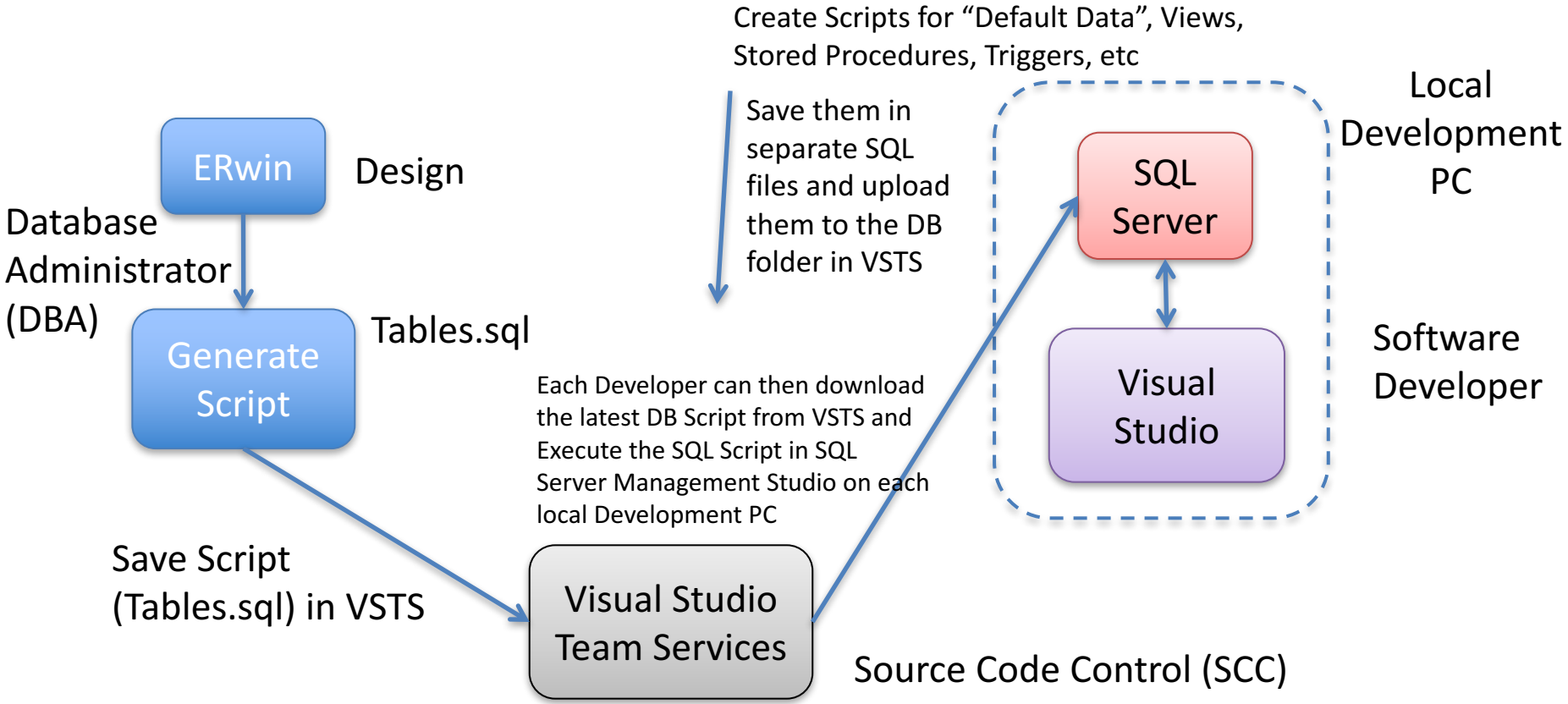
Developer: Need to Deploy to Web Servers.
End-user: Don't need to install anything, available from a Web Browser. Latest version always available without any installation.

Developer: Need to Deploy to App Stores.
End-user: Easy to install from an App store. Updates can be installed automatically.

Developer Environment vs. Production Environment



Create Database SQL Scripts



The DBA is in charge of maintening the DB Script that can be used on the Developer PCs and later deployed in the Customer Environment

Web Deployment

Deployment of Web Sites, Web Apps, Web Services, etc.

Hans-Petter Halvorsen, M.Sc.

Web Deployment

Servers

Web Servers

Database Servers

The Cloud/
Internet/
Local Network

Clients

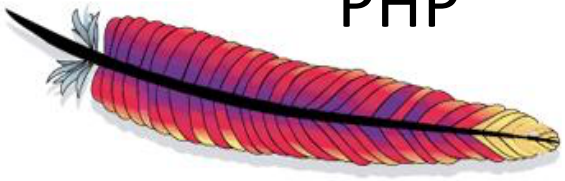
PCs with Web Browsers

Database Platforms

Web Server Platforms

(pronounced "engine x")
- Has become very popular lately

PHP



Microsoft IIS

Internet Information Services

ASP.NET

Cross-platform: UNIX, Linux, OS X, Windows, ...

The term web server can refer to either the hardware (the computer) or the software (the computer application) that helps to deliver web content that can be accessed through the Internet.
The most common use of web servers is to host websites, but there are other uses such as gaming, data storage or running enterprise applications.

Microsoft Azure

Hans-Petter Halvorsen, M.Sc.

Microsoft Azure

"Windows running in the Cloud"

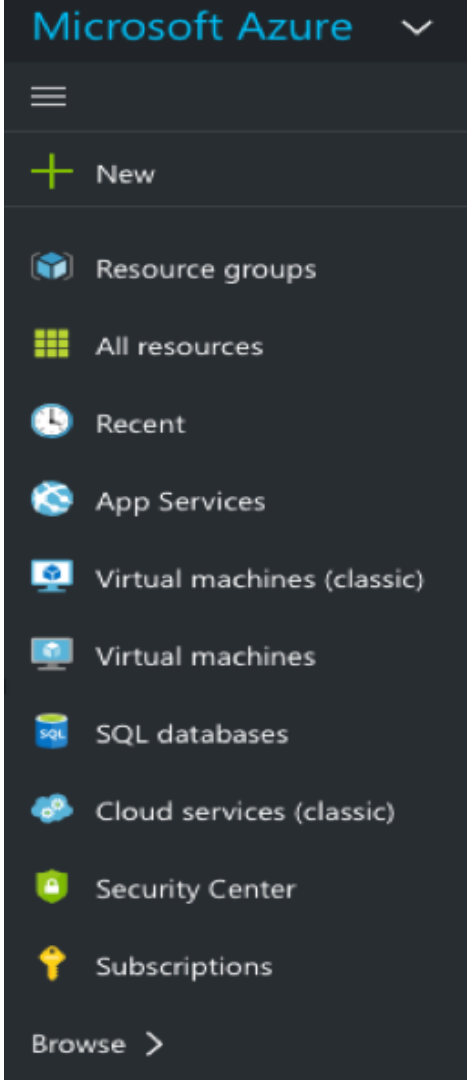
SQL Databases

Virtual Machines

Storage

Cloud Services

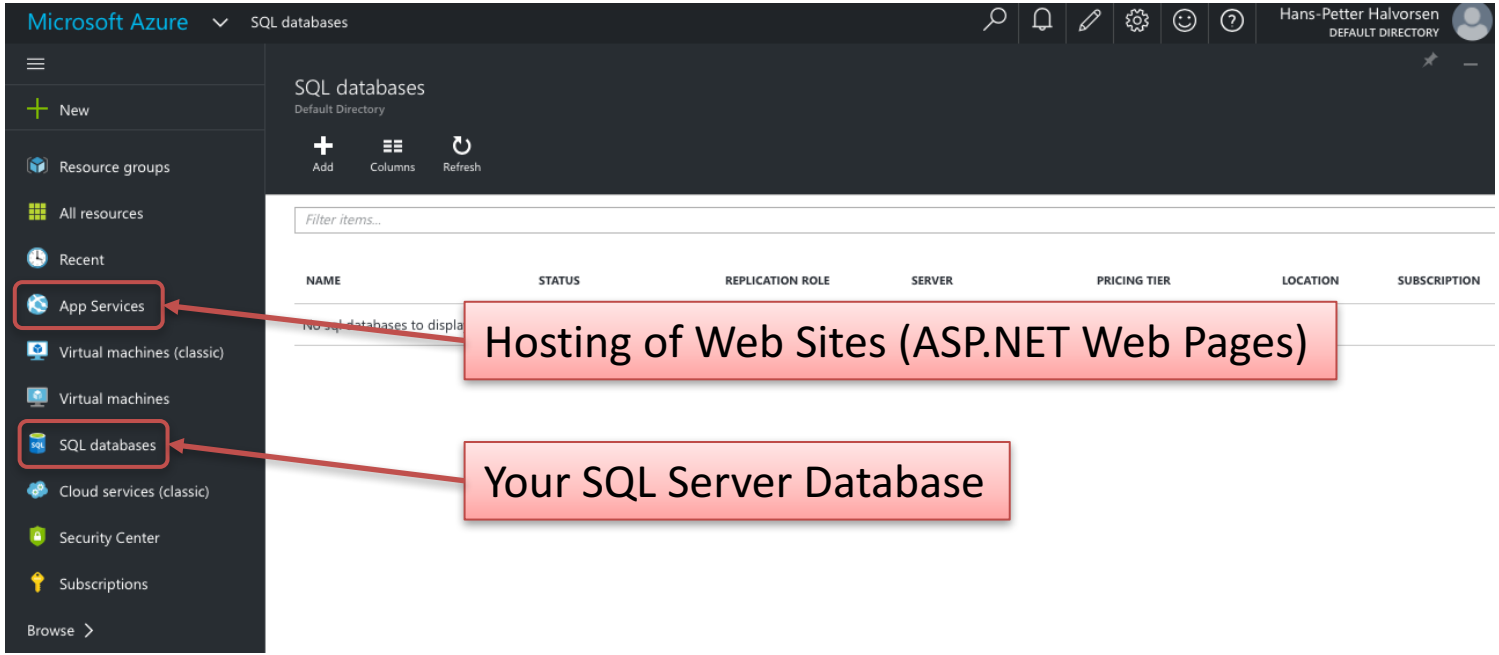
App Services



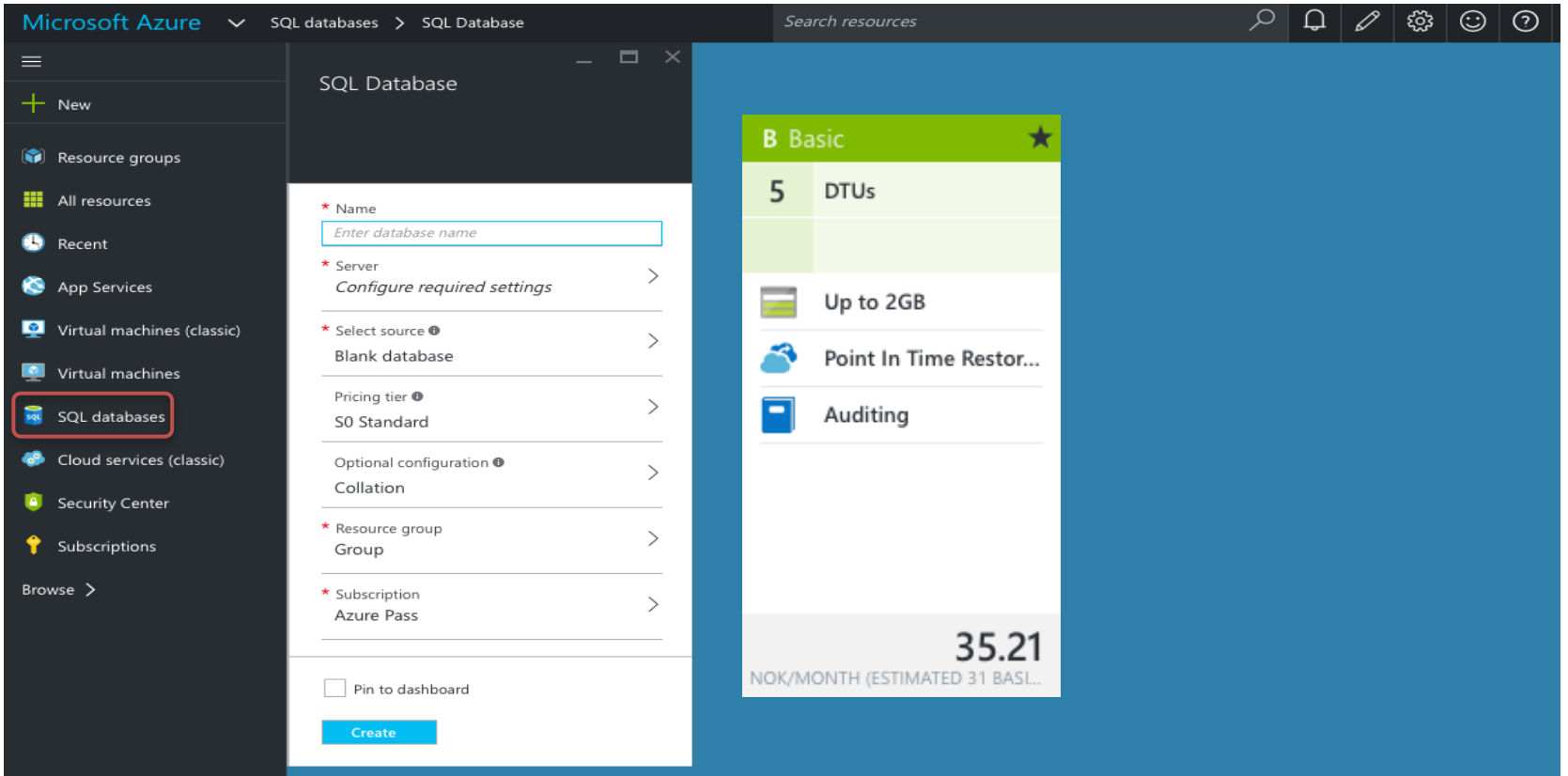
Microsoft Azure

Deployment to Microsoft Azure

Microsoft Azure Portal (https://portal.azure.com)



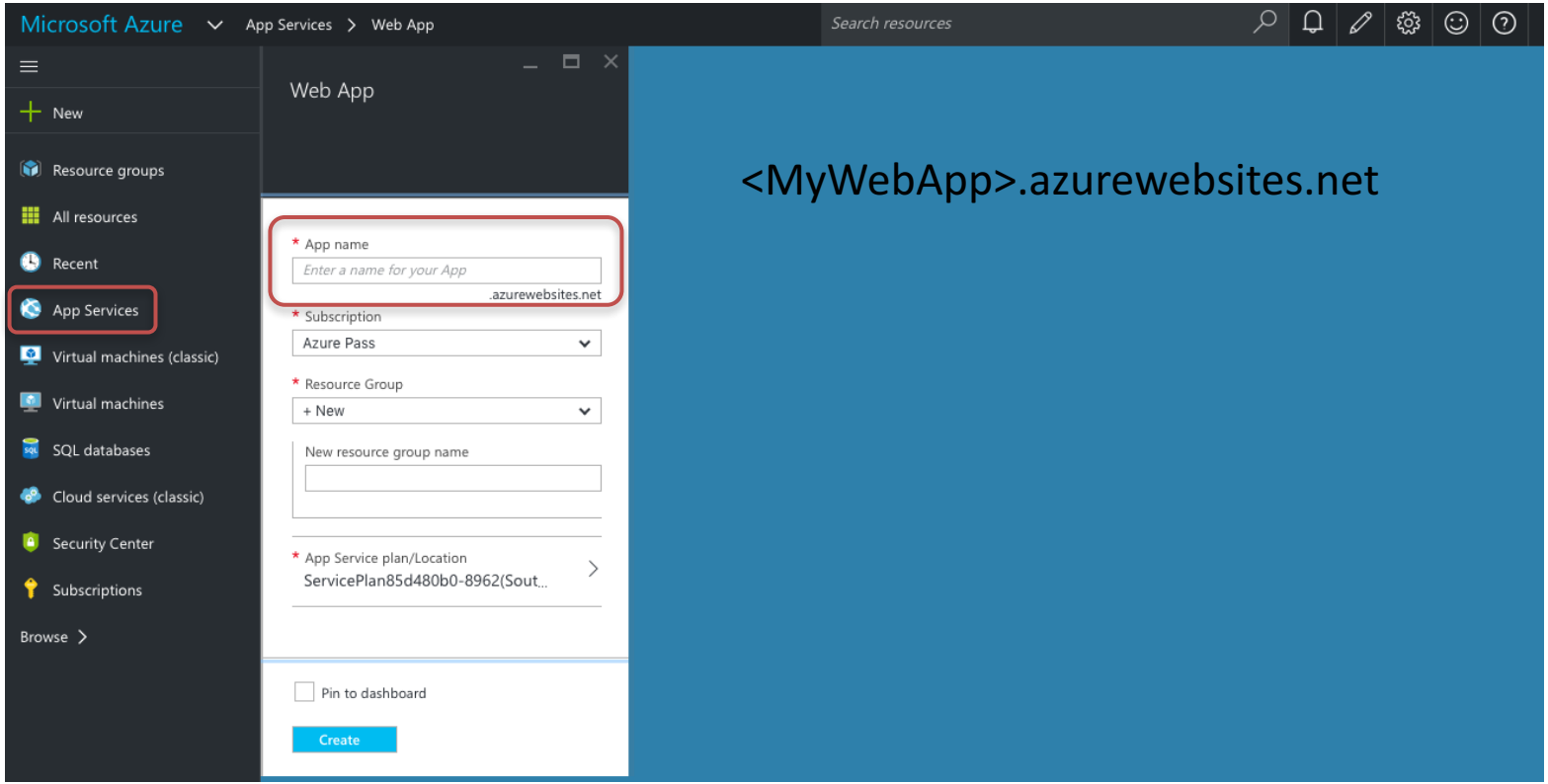
Create SQL Server Database in Microsoft Azure



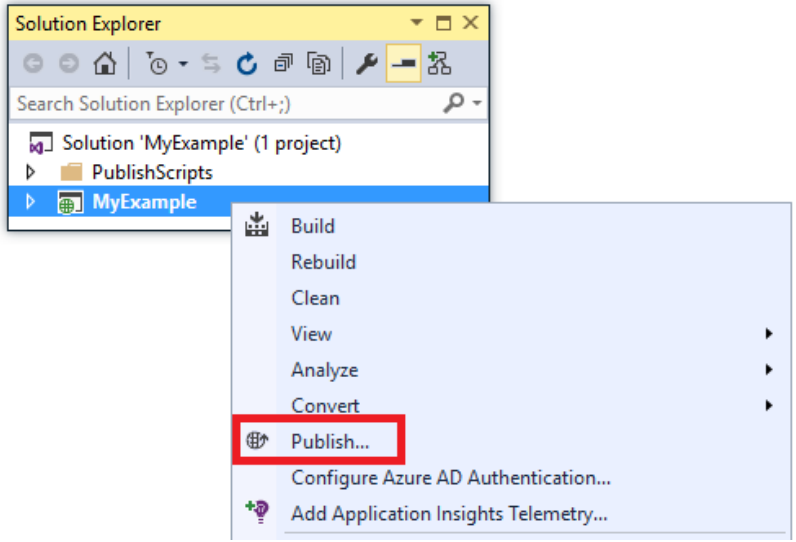
Connect to the Microsoft Azure SQL Server from your local SQL Management Studio

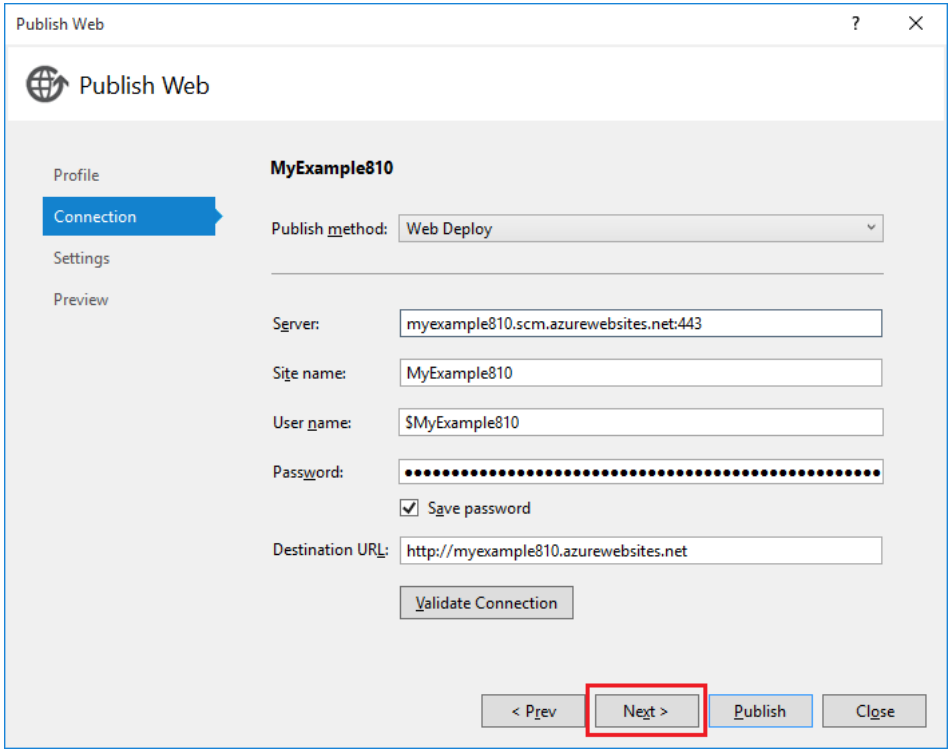
1. You connect to the Microsoft Azure SQL Server Database in the same way as you connect to a local Database
2. Note! You Need to Configure Firewall in Microsoft Azure
3. Create Tables, Views, Stored Procedures, etc. -> using a SQL Script is recommended!

Create App Service from Azure Portal



Deploy the Web Project to the Azure Web App from Visual Studio



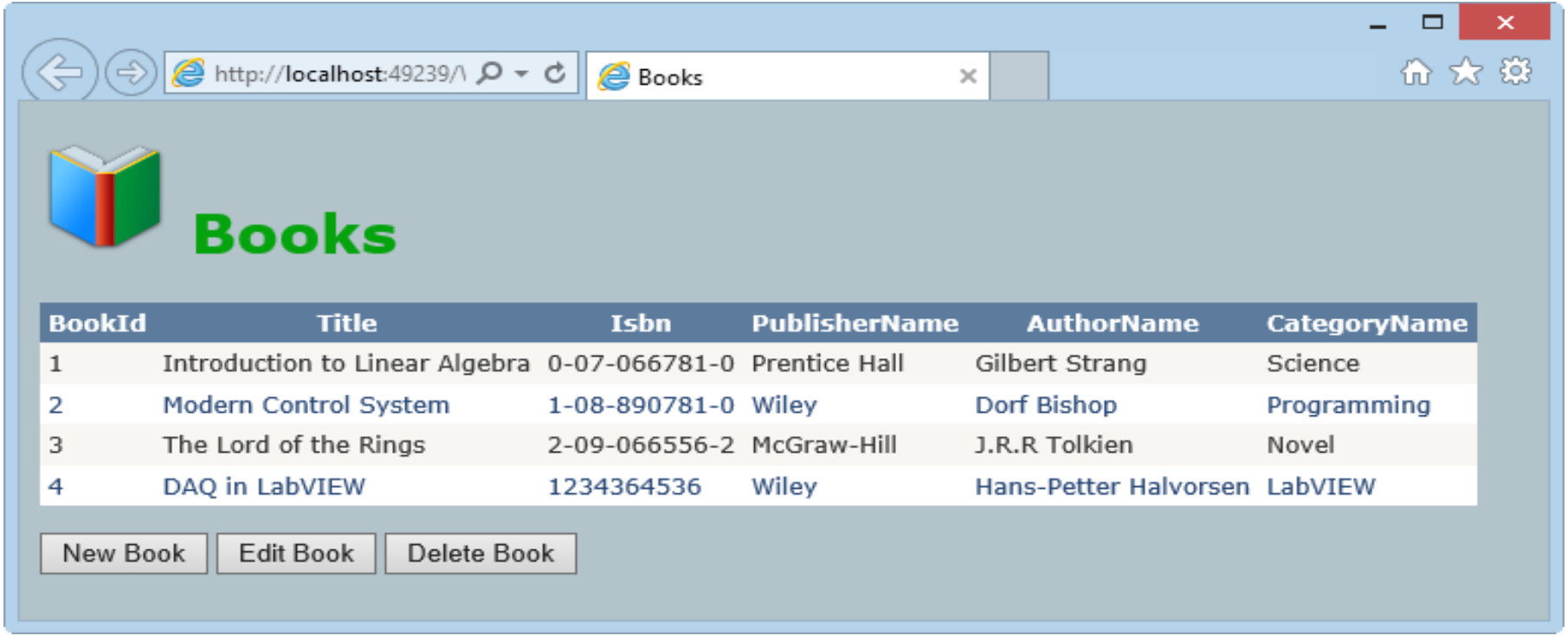


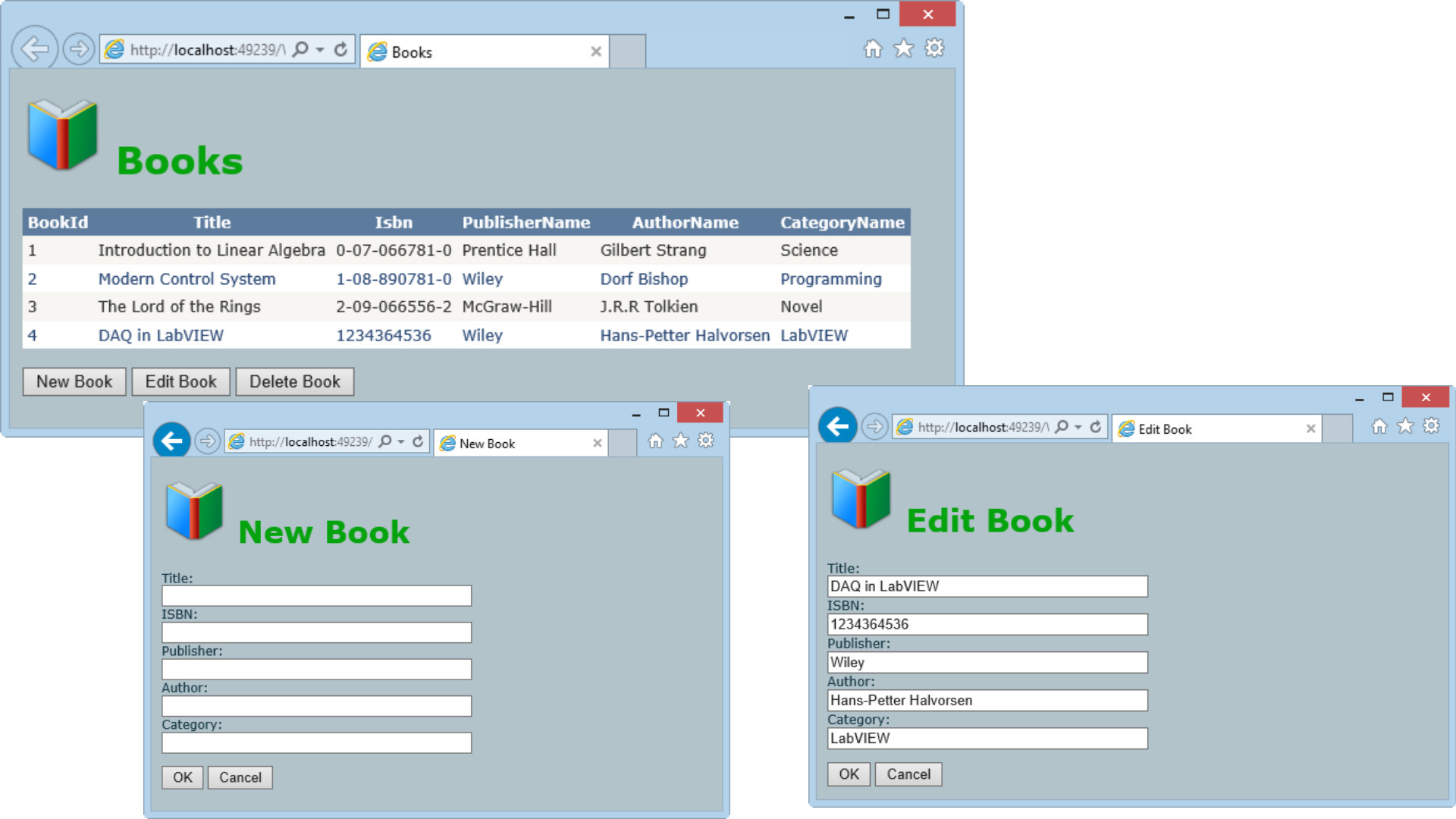
Example 1

Web App Deployment Example

Hans-Petter Halvorsen, M.Sc.

ASP.NET Web App

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Books
Books
BookId Title Isbn PublisherName AuthorName CategoryName
1 Introduction to Linear Algebra 0-07-066781-0 Prentice Hall Gilbert Strang Science
2 Modern Control System 1-08-890781-0 Wiley Dorf Bishop Programming
3 The Lord of the Rings 2-09-066556-2 McGraw-Hill J.R.R Tolkien Novel
4 DAQ in LabVIEW 1234364536 Wiley Hans-Petter Halvorsen LabVIEW
New Book
Edit Book
Delete Book
http://localhost:49239/
New Book
New Book
Title:
ISBN:
Publisher:
Author:
Category:
OK
Cancel
http://localhost:49239/\
Edit Book
Edit Book
Title:
DAQ in LabVIEW
ISBN:
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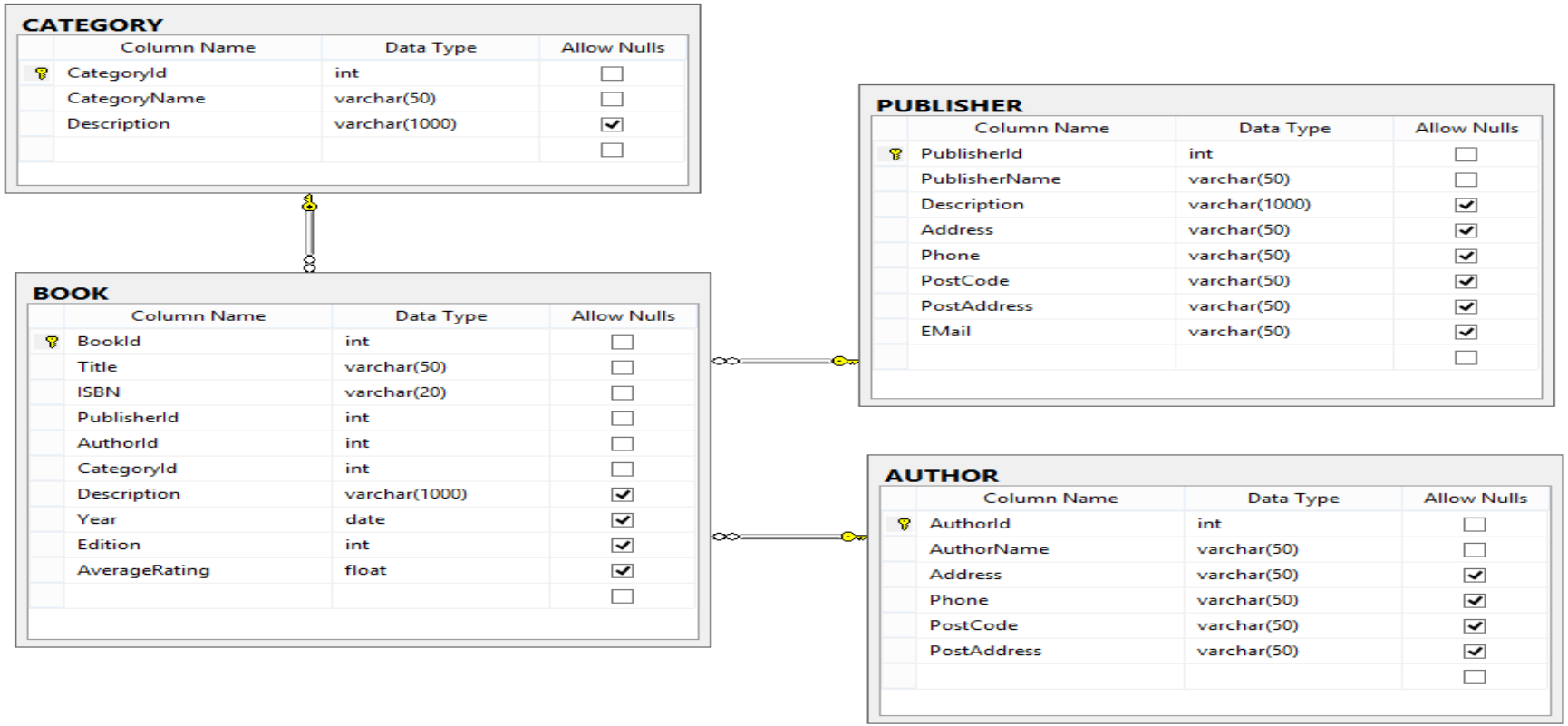
Author:
Hans-Petter Halvorsen
Category:
LabVIEW
OK
Cancel

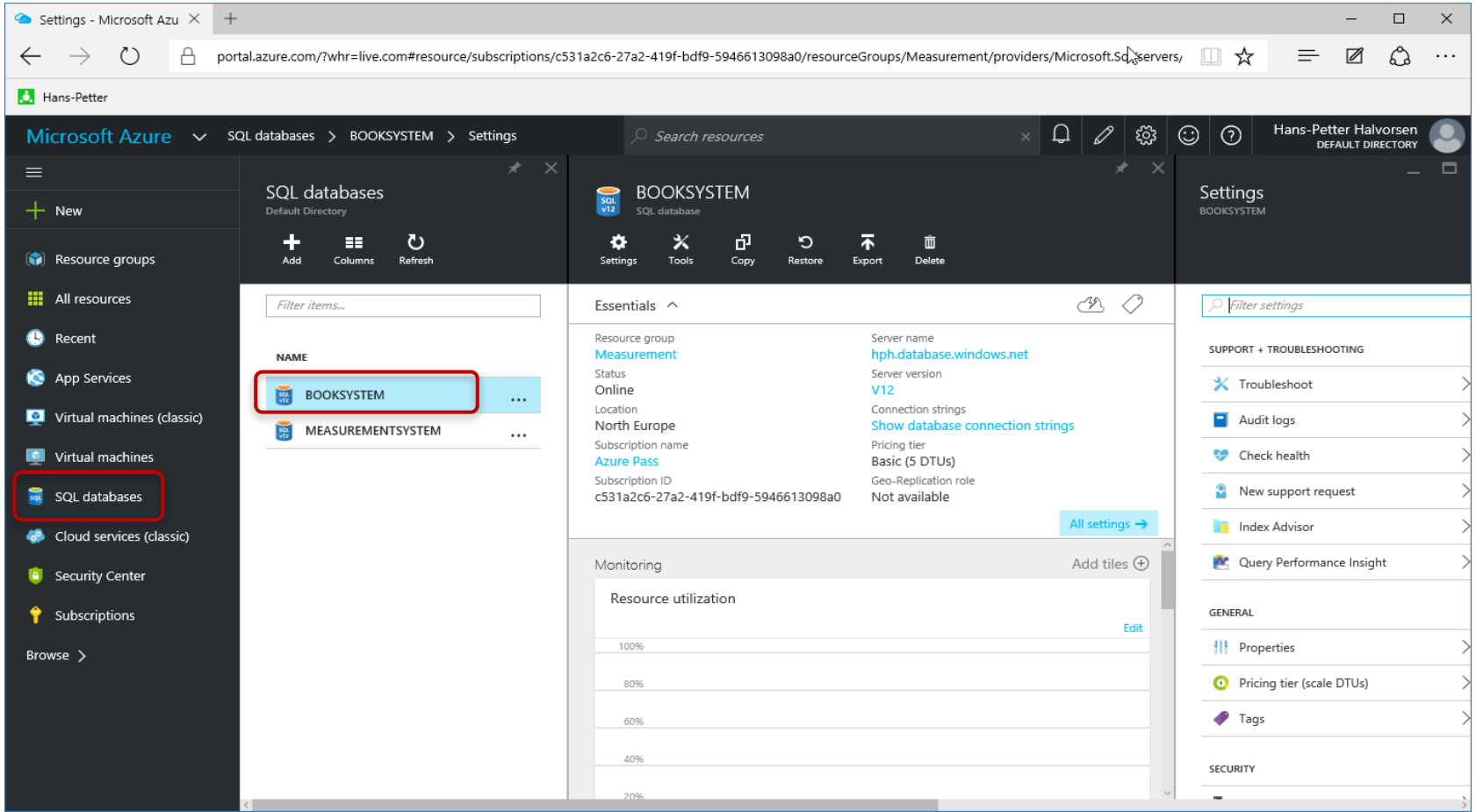
Database

Database

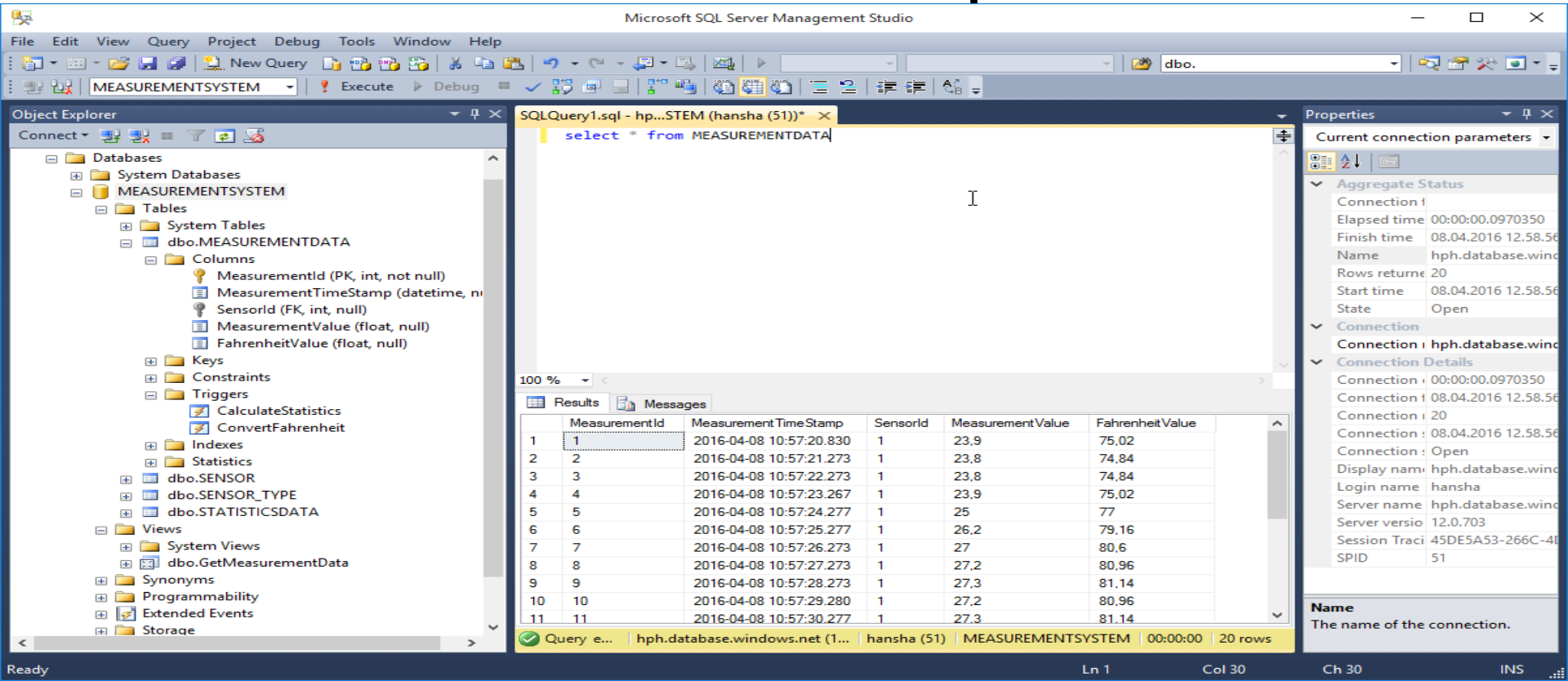
This is our Example Database (SQL Server Designer)



Create Database in Microsoft Azure Portal

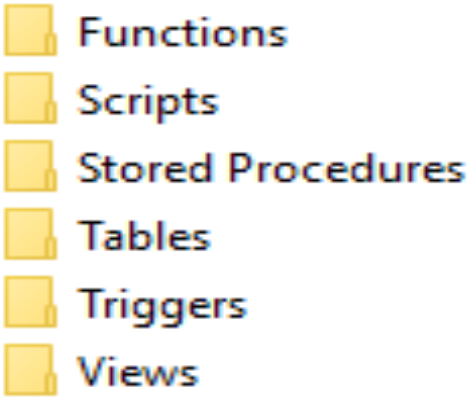


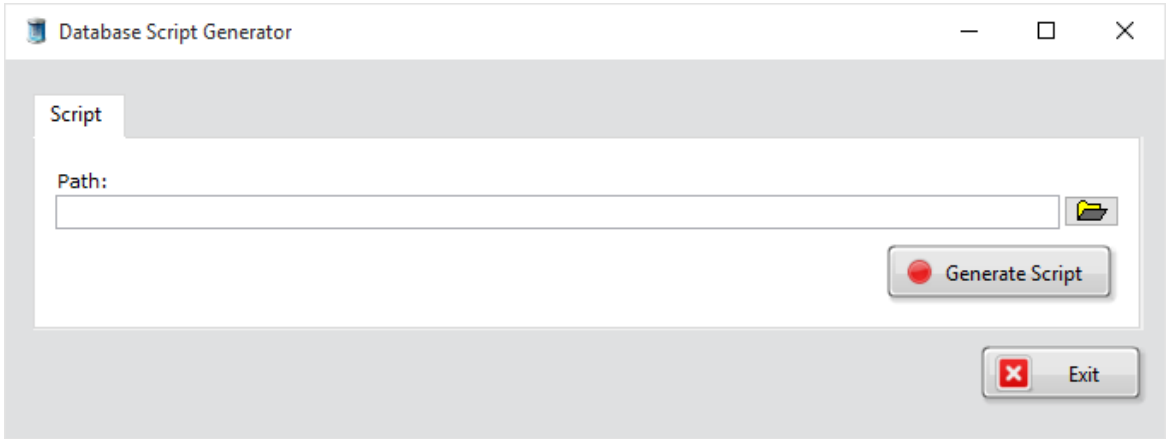
Connect to Microsoft Azure Database from Local Computer



Database

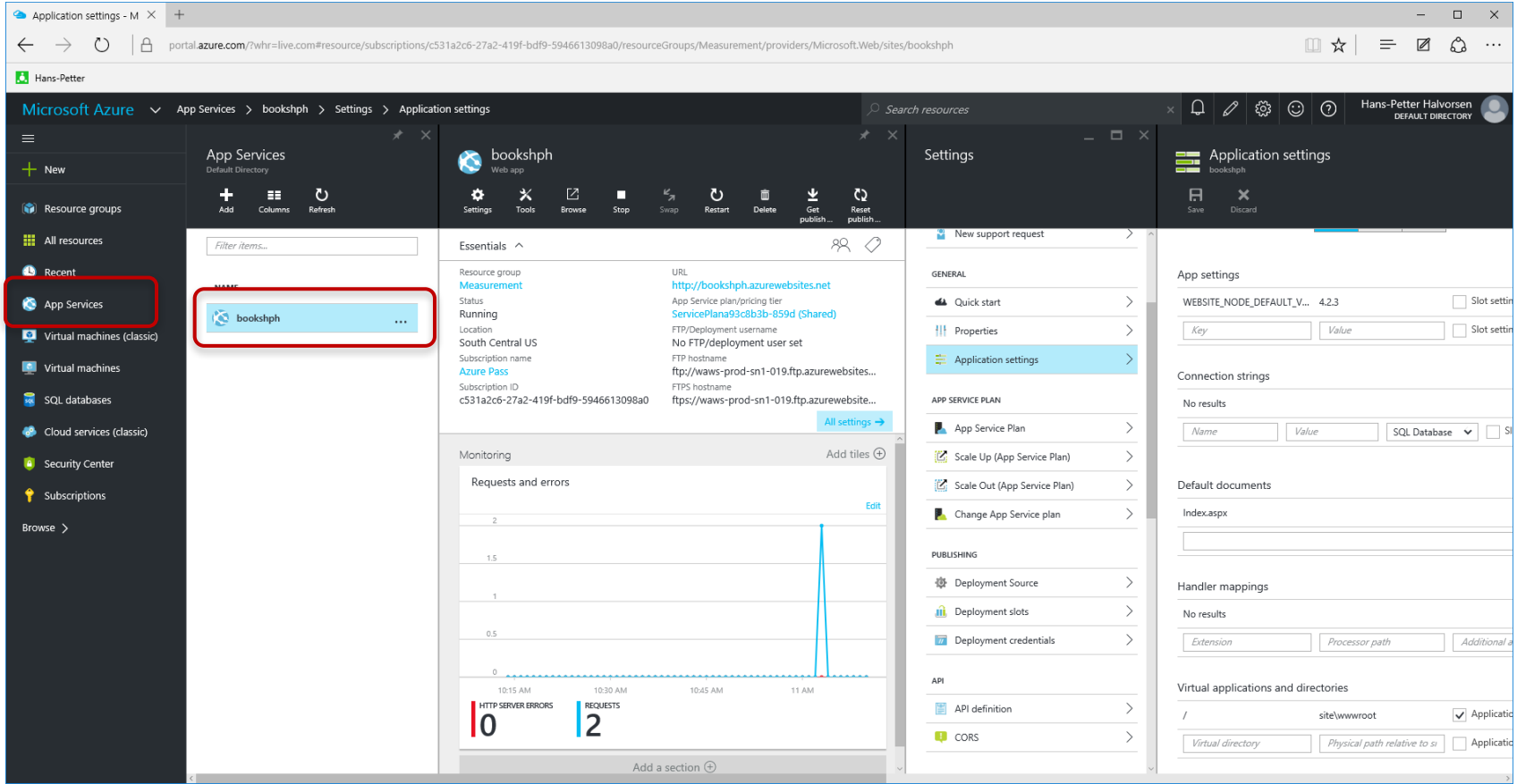
Since all necessary Tables, Views, Stored Procedures, etc. already are stored in one single SQL File it is easy to Deploy the Database to the Microsoft Azure Database



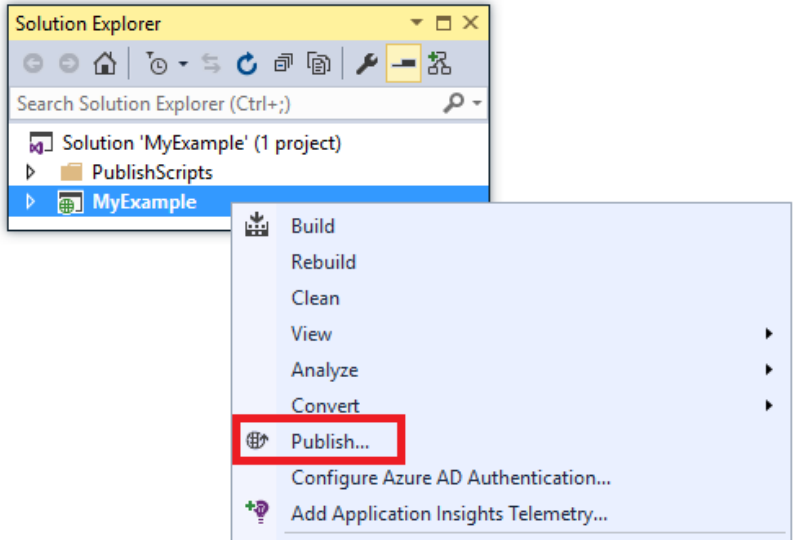


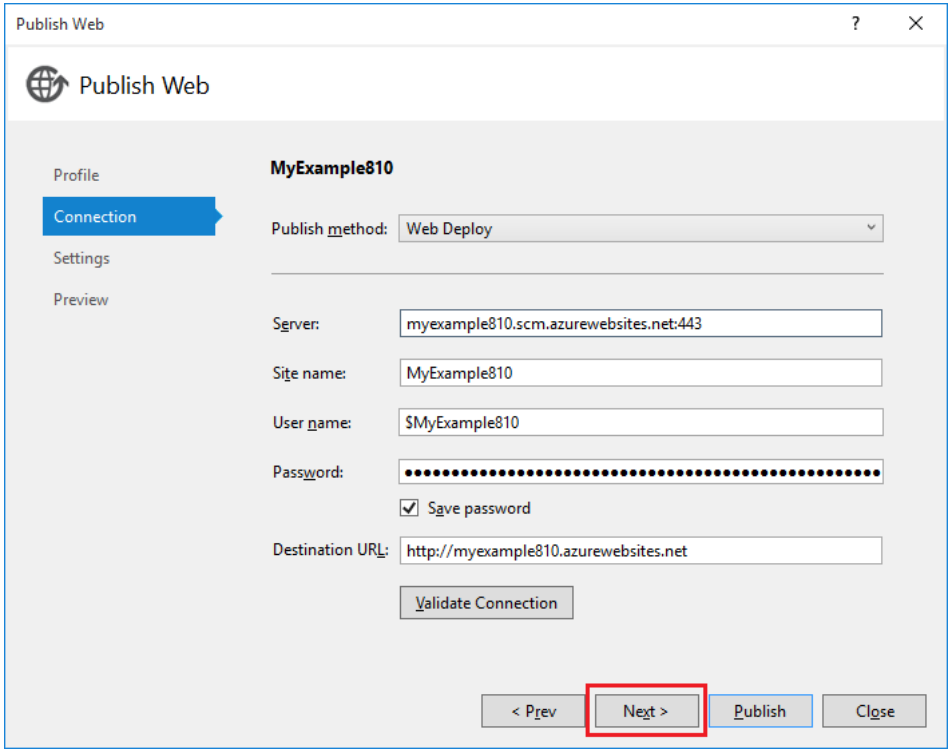
Deploy Web App

Create App Service



Deploy the Web Project to the Azure Web App from Visual Studio

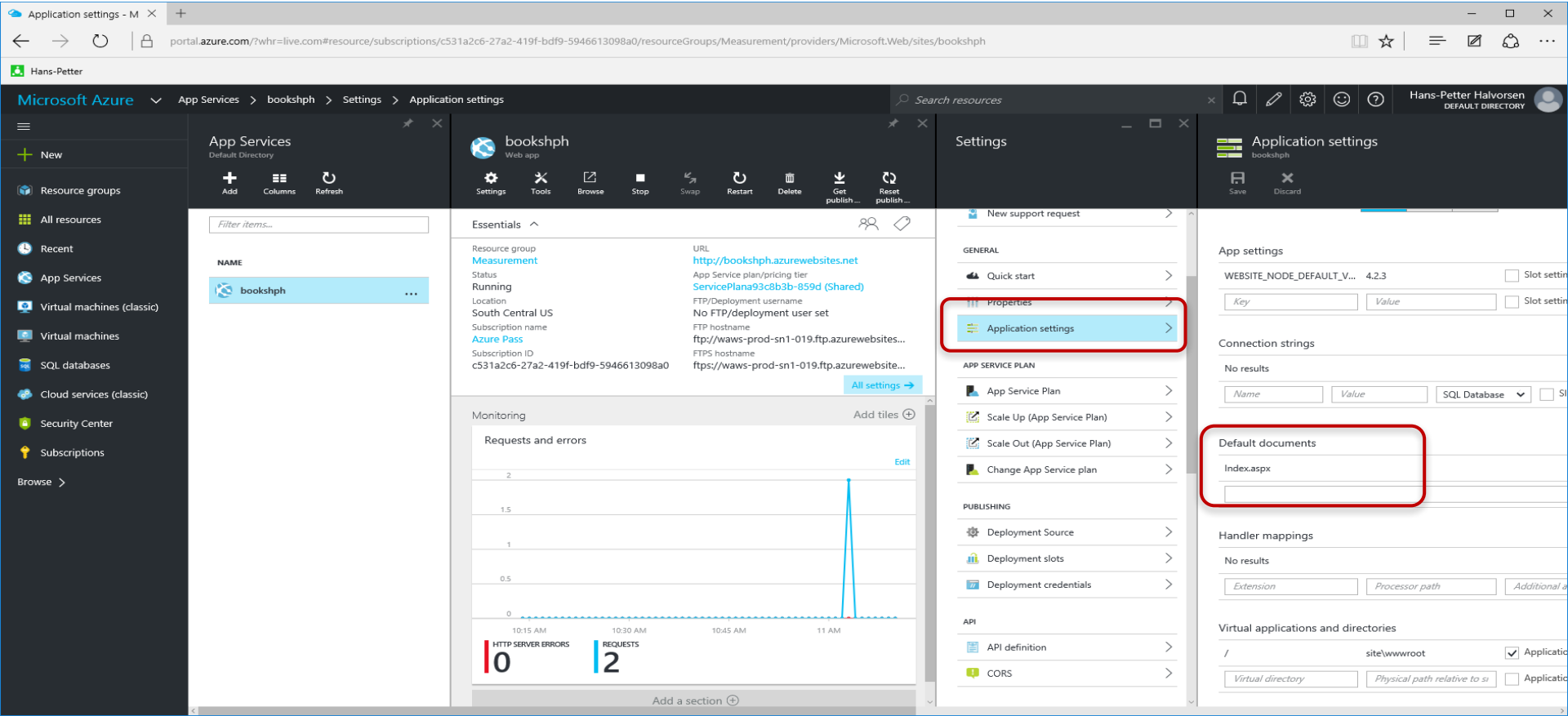




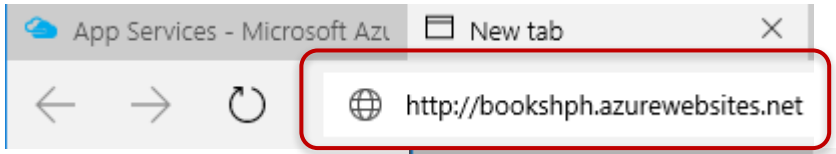
Web.config

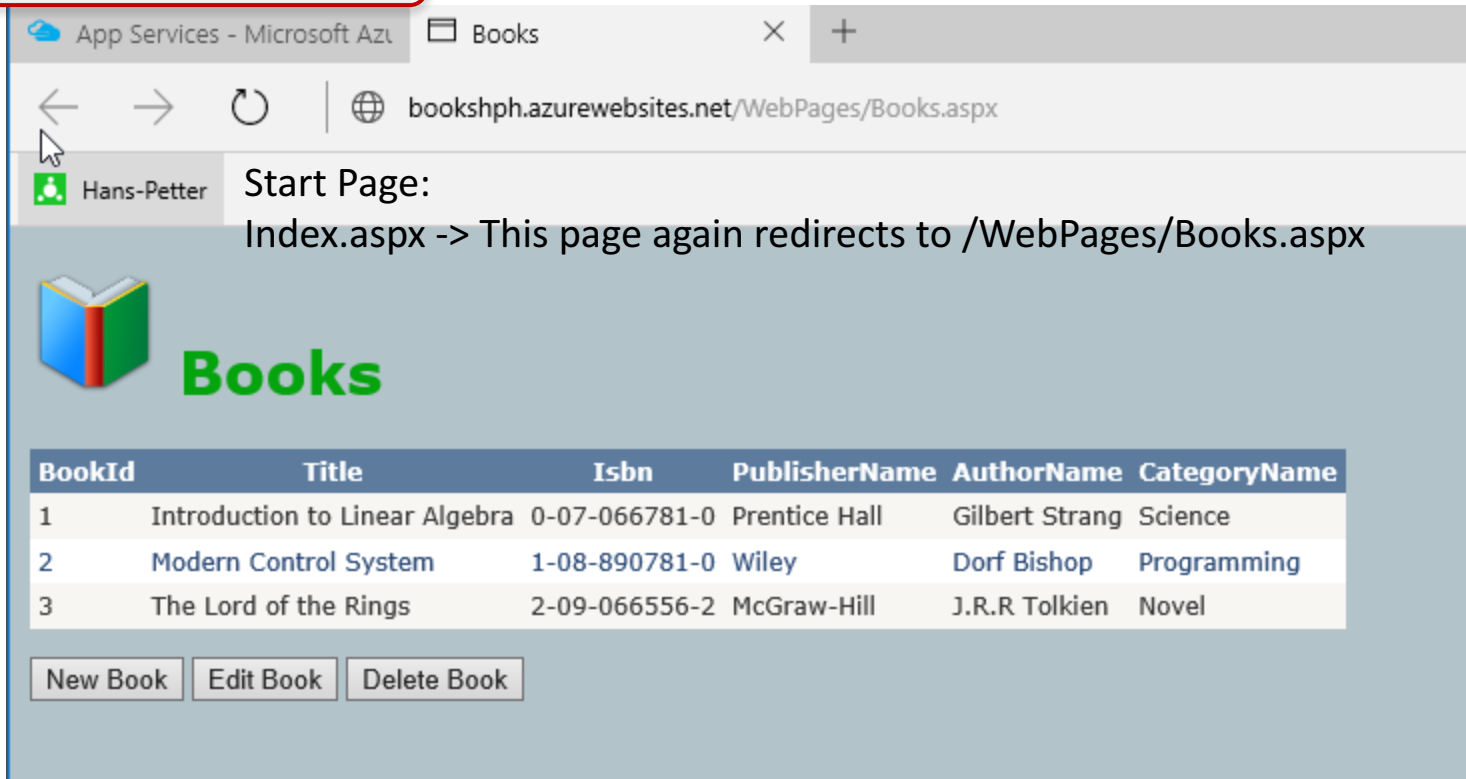
- Since the Connection String already is stored in Web.Config, it is easy to change the Connection string according to the Microsoft Azure Database

Default Documents



Finished


App Services - Microsoft Azu
New tab
http://bookshph.azurewebsites.net


App Services - Microsoft Azu
Books
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Hans-Petter
Start Page:
Index.aspx -> This page again redirects to /WebPages/Books.aspx
Books
BookId Title Isbn PublisherName AuthorName CategoryName
1 Introduction to Linear Algebra 0-07-066781-0 Prentice Hall Gilbert Strang Science
2 Modern Control System 1-08-890781-0 Wiley Dorf Bishop Programming
3 The Lord of the Rings 2-09-066556-2 McGraw-Hill J.R.R Tolkien Novel
New Book
Edit Book
Delete Book

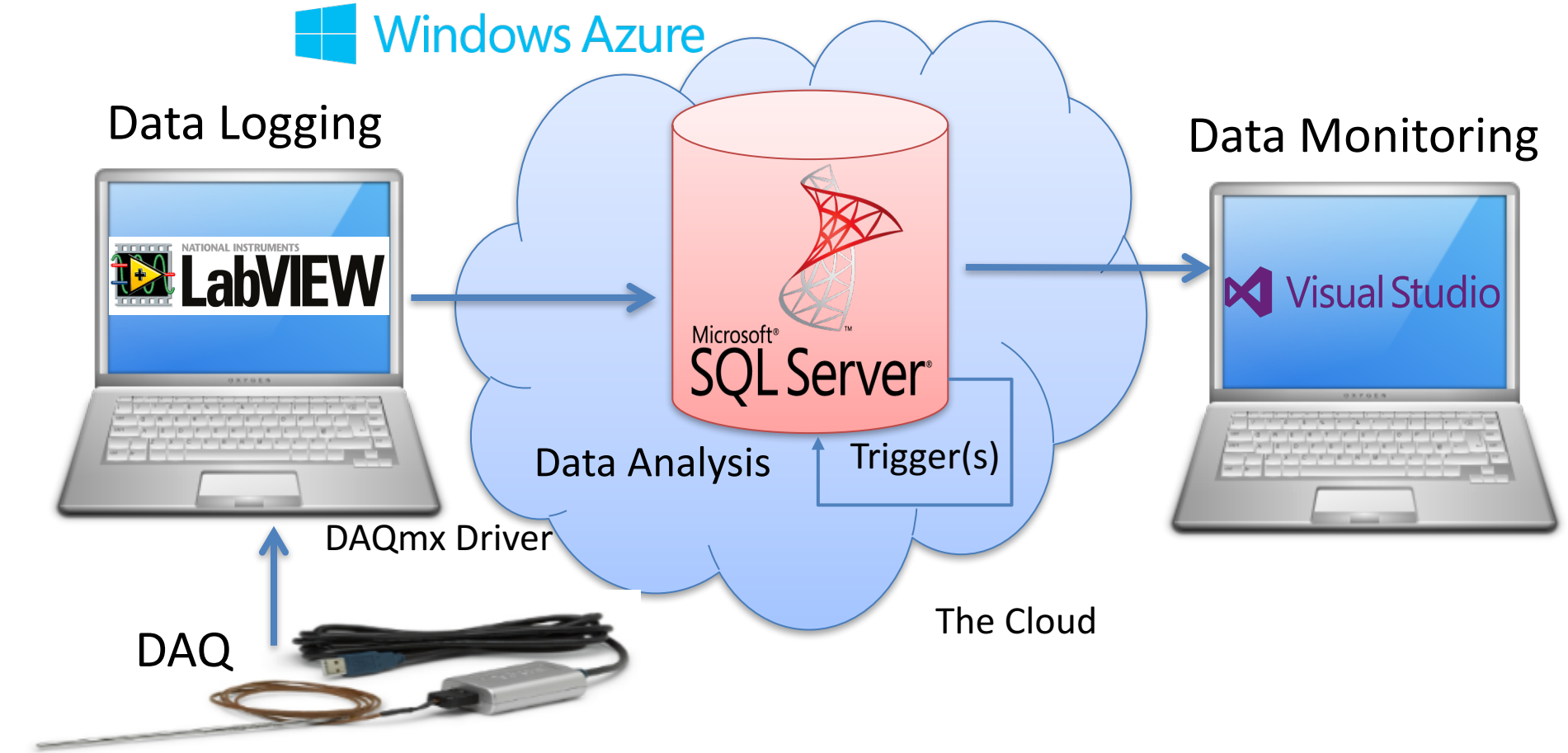
Example 2

https://www.youtube.com/watch?v=xAZm--SshKw

Datalogging and Monitoring Example

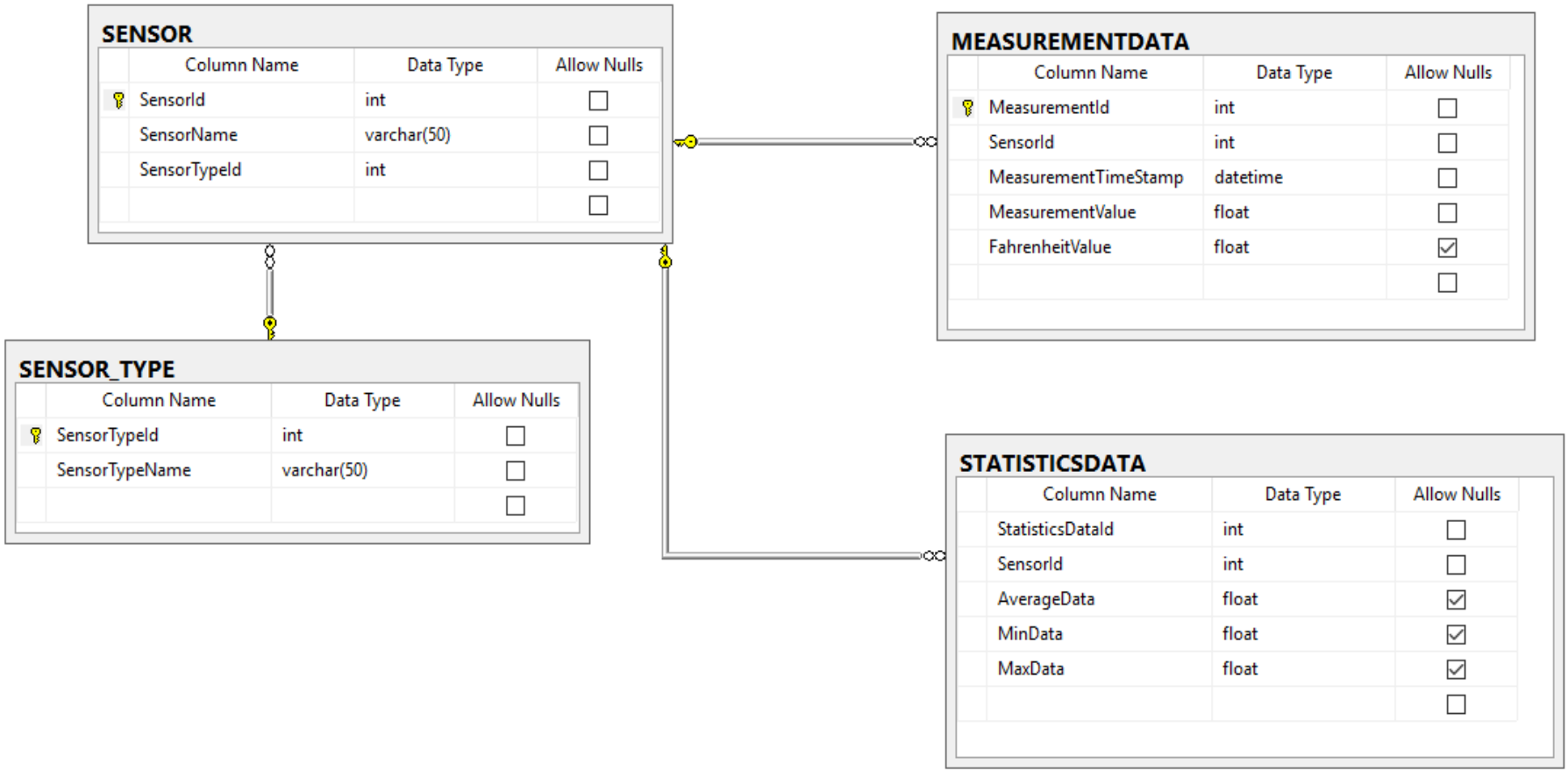
Hans-Petter Halvorsen, M.Sc.

System Overview

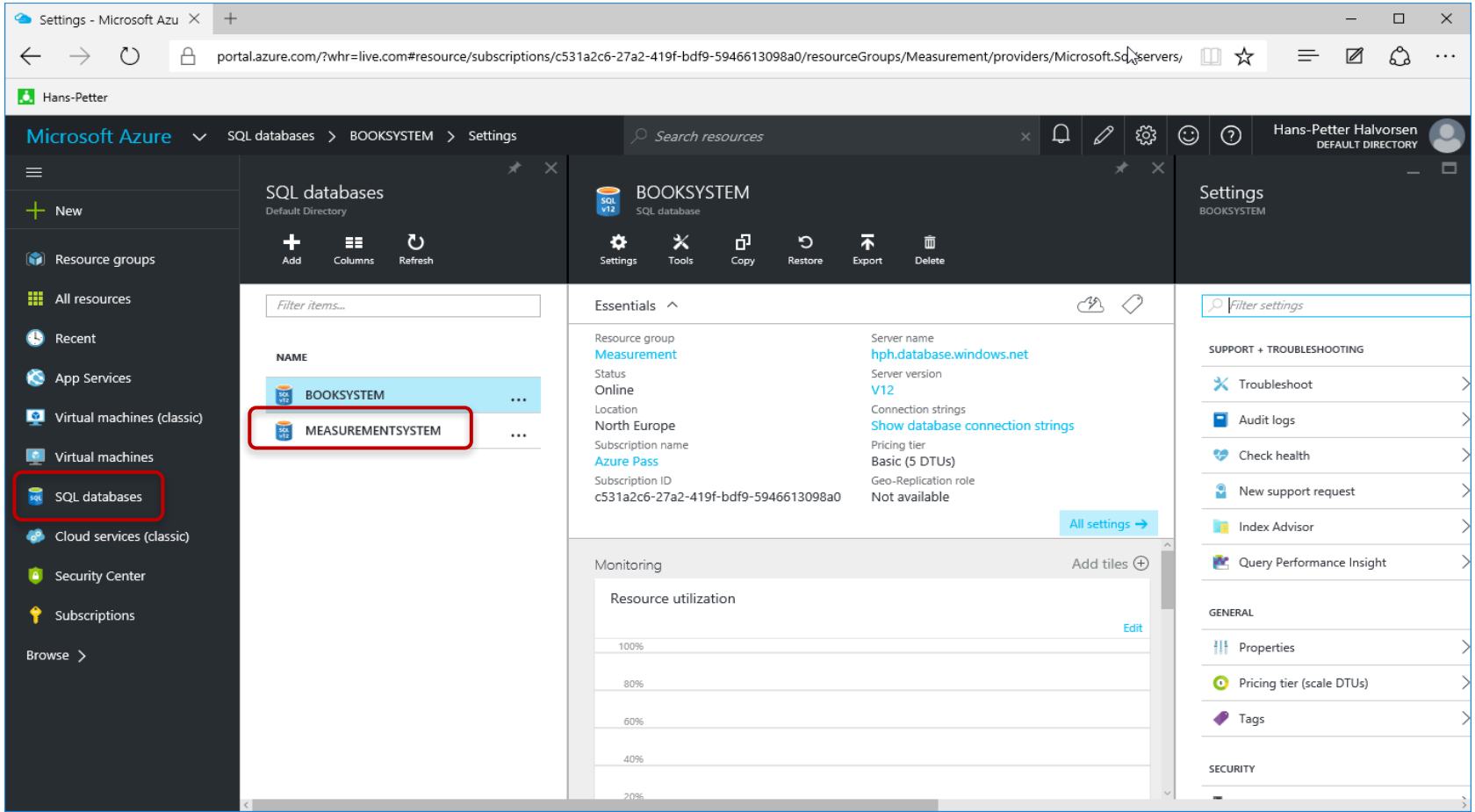


Database

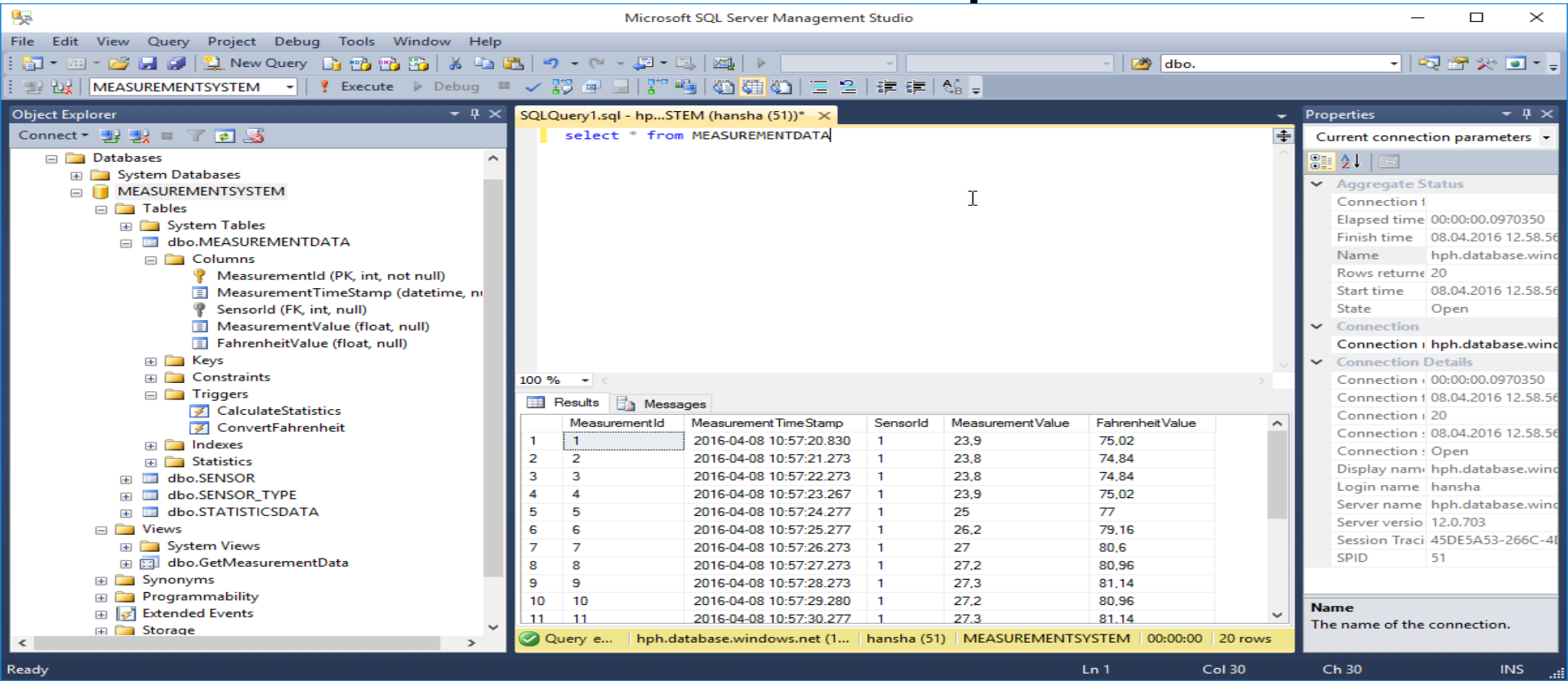
Database


SENSOR
Column Name
Data Type
Allow Nulls
SensorId
int
SensorName
varchar(50)
SensorTypeId
int
MEASUREMENTDATA
Column Name
Data Type
Allow Nulls
MeasurementId
int
SensorId
int
MeasurementTimeStamp
datetime
MeasurementValue
float
FahrenheitValue
float
SENSOR_TYPE
Column Name
Data Type
Allow Nulls
SensorTypeId
int
SensorTypeName
varchar(50)
STATISTICSDATA
Column Name
Data Type
Allow Nulls
StatisticsDataId
int
SensorId
int
AverageData
float
MinData
float
MaxData
float

Create Database in Microsoft Azure Portal

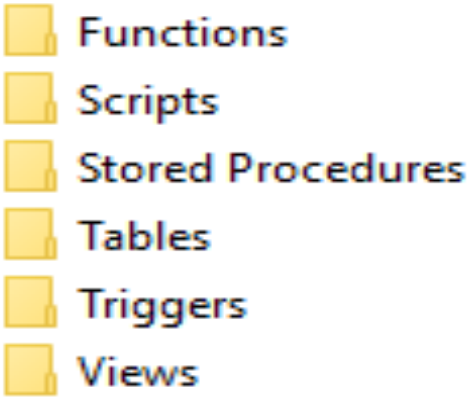


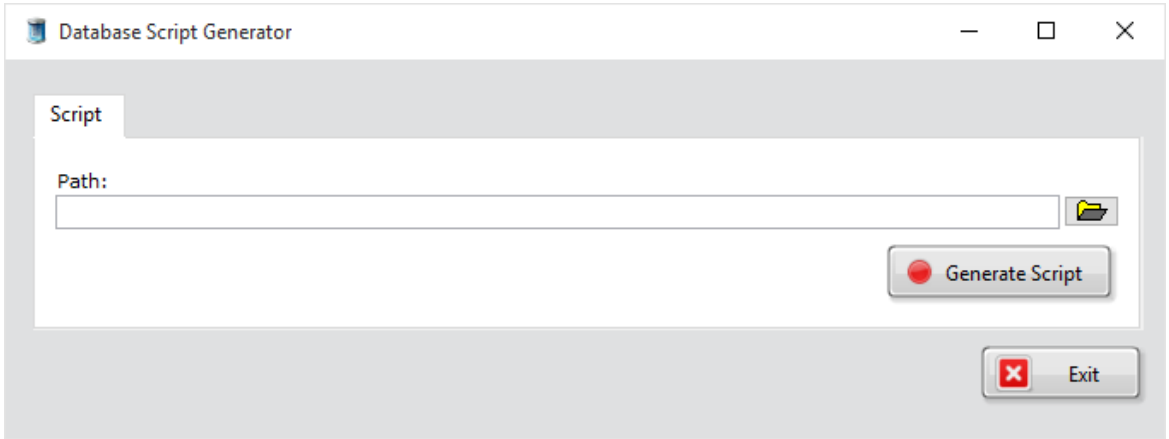
Connect to Microsoft Azure Database from Local Computer



Database

Since all necessary Tables, Views, Stored Procedures, etc. already are stored in one single SQL File it is easy to Deploy the Database to the Microsoft Azure Database



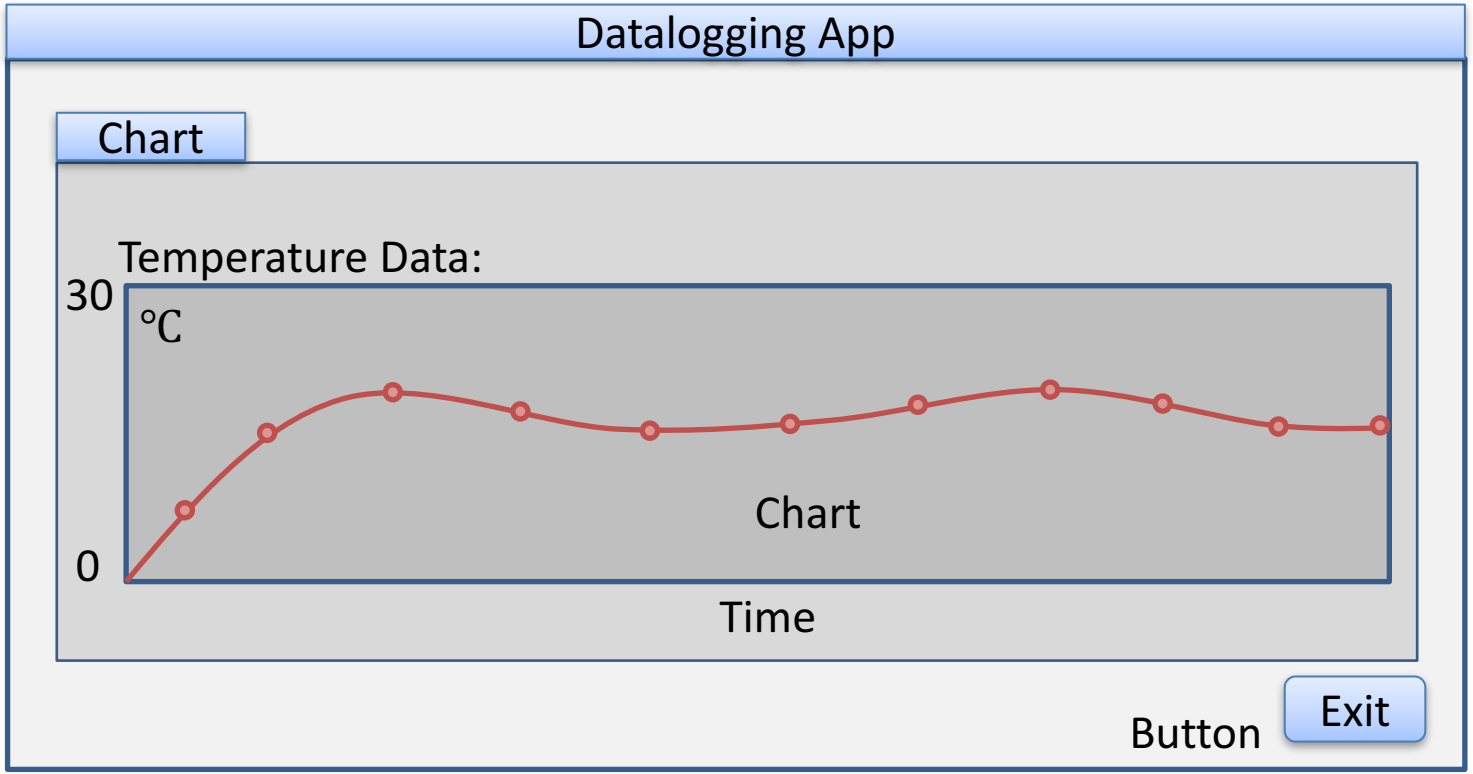


Datalogging App

Store Measurement Data in the Cloud (Microsoft Azure)

LabVIEW HMI Example

The Temperature Data from the TC-01 DAQ device should be stored in the Database.



Logging App.vi Front Panel

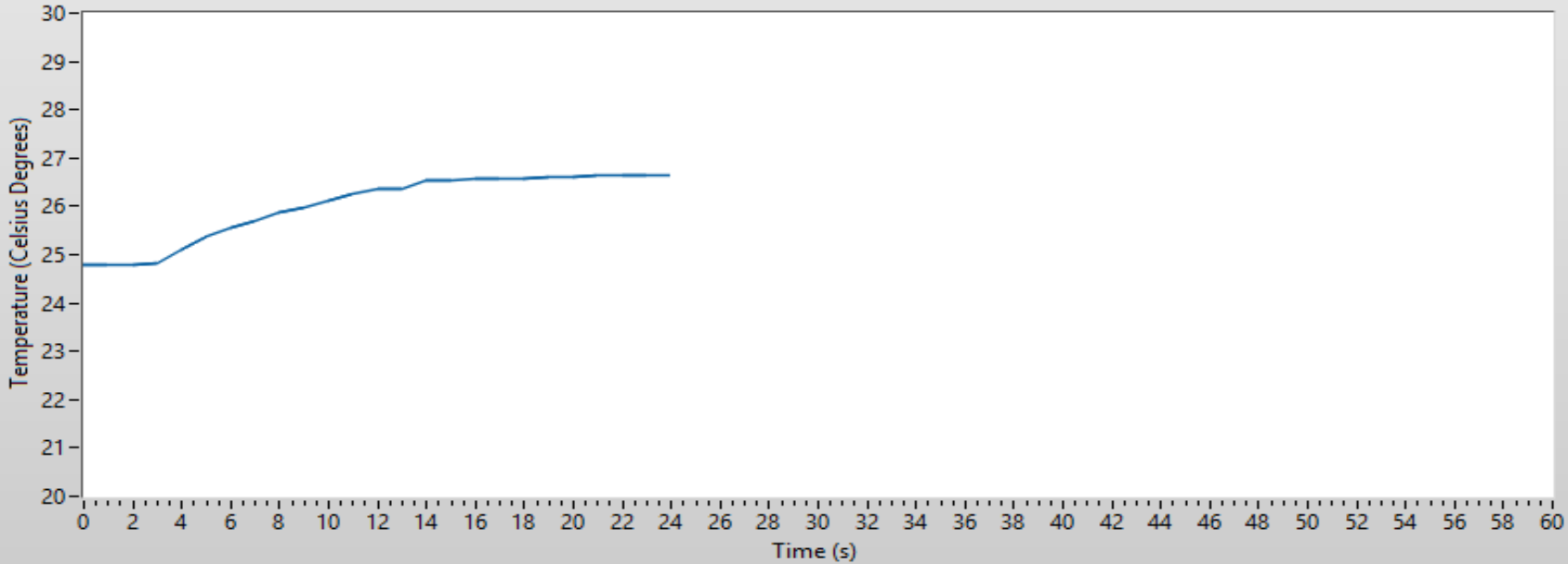
File Edit View Project Operate Tools Window Help

15pt Application Font

Search

Plot 0

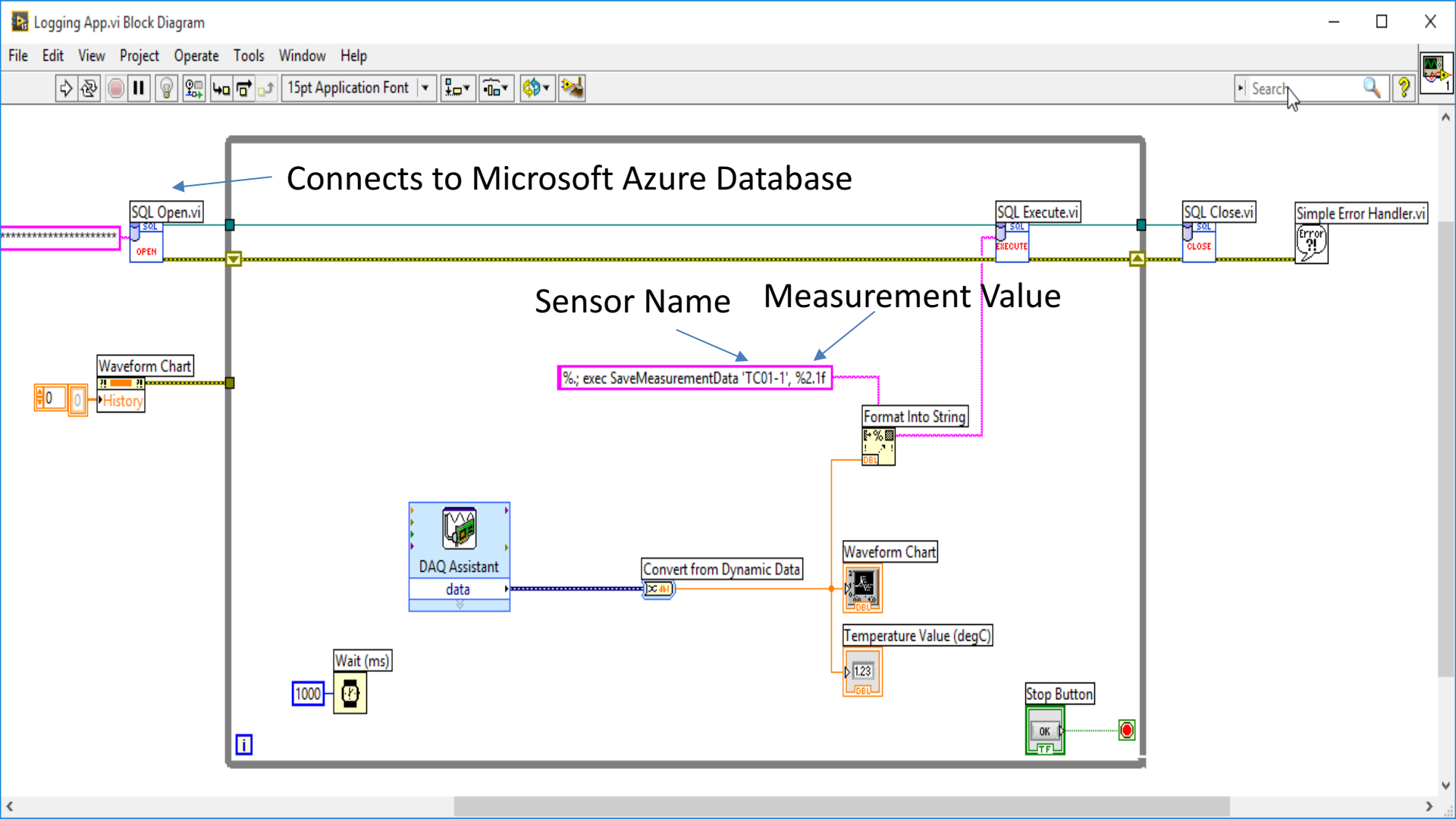
Waveform Chart



Temperature Value (degC)

26,7

Stop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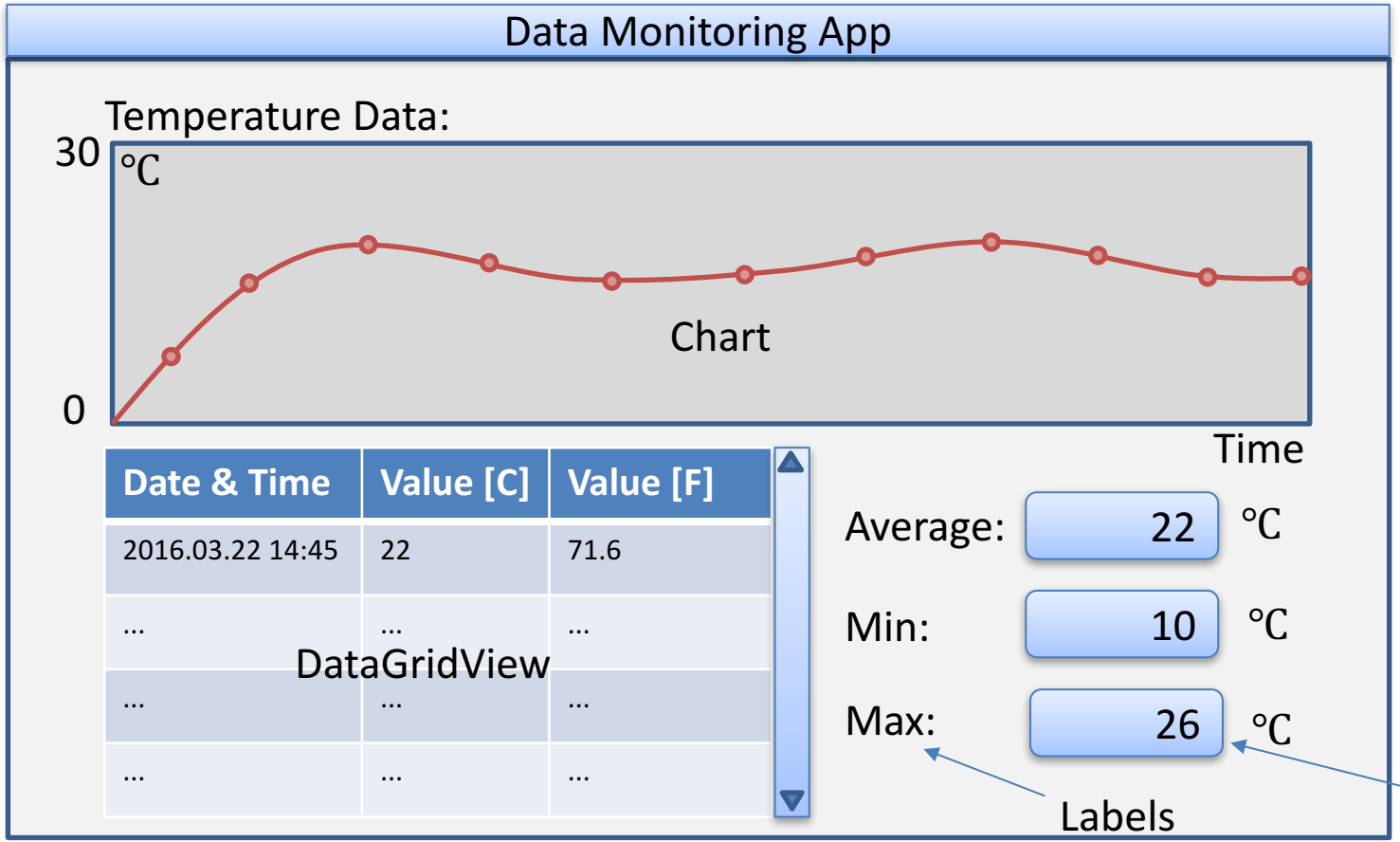
File Edit View Project Operate Tools Window Help
15pt Application Font
Search
Connects to Microsoft Azure Database
SQL Open.vi
SQL Execute.vi
SQL Close.vi
Simple Error Handler.vi
Sensor Name
Measurement Value
Waveform Chart
History
%.; exec SaveMeasurementData 'TC01-1', %2.1f
Format Into String
DAQ Assistant
data
Convert from Dynamic Data
Waveform Chart
Temperature Value (degC)
Wait (ms)
1000
Stop Button

Monitoring App

Getting Measurement and Analysis Data from the Cloud (Microsoft Azure)

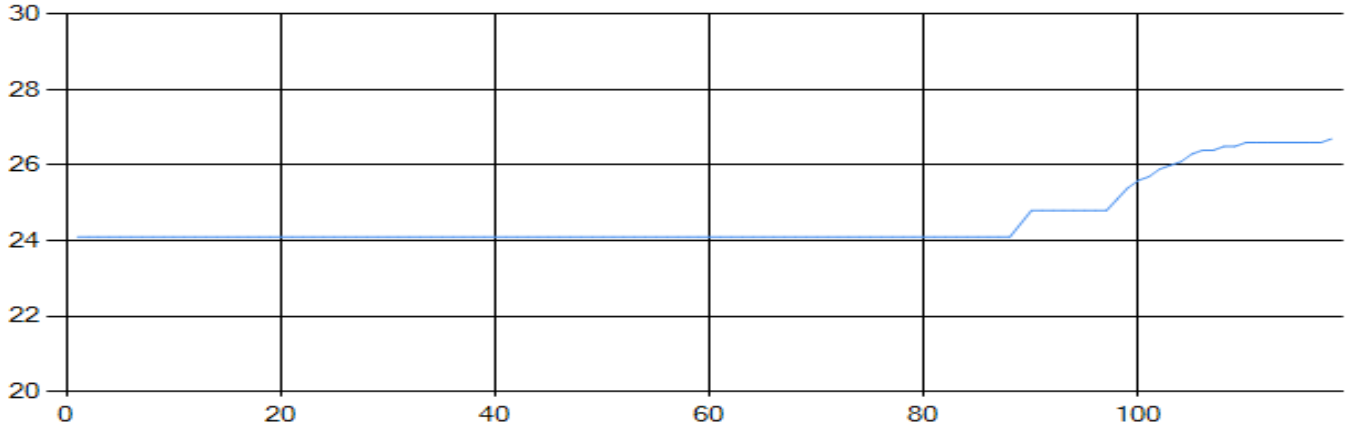
Visual Studio HMI Example



You should get the Data from the Database

Typically you get Data from the Database using Views and/or Stored Procedures

Monitoring App



MeasurementId	MeasurementTimeStamp	MeasurementValue	FahrenheitValue
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2	07.04.2016 10.44	24,1	75,38
3	07.04.2016 10.44	24,1	75,38
4	07.04.2016 10.44	24,1	75,38
5	07.04.2016 10.44	24,1	75,38
6	07.04.2016 10.44	24,1	75,38
7	07.04.2016 10.44	24,1	75,38
8	07.04.2016 10.44	24,1	75,38
9	07.04.2016 10.44	24,1	75,38
10	07.04.2016 10.44	24,1	75,38
11	07.04.2016 10.44	24,1	75,38
12	07.04.2016 10.44	24,1	75,38
13	07.04.2016 10.44	24,1	75,38

Statistics Data

Min:
24,1

Max:
26,7

Average:
24,5350427350427

App.config

- Since the Connection String already is stored in App.Config, it is easy to change the Connection string according to the Microsoft Azure Database

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Blog: http://home.hit.no/~hansha/