https://www.halvorsen.blog

Week Assignment

Deployment & Installation

Hans-Petter Halvorsen

Week Assignment

1. **Deployment** of your **Applications** (Choose the ones that is appropriate for your project):
   A. Use **Cloud Hosting** (We will deploy our ASP.NET Application into Microsoft Azure)
   B. Create **Executable/Setup Package**(s)
2. Create **Installation Guide**(s). We should make one or more **Videos**.
3. Update "**Product Web Page**" (HTML) for Final Software Release
   – Include/Embed Videos
   – Add link to the Deployed Demo System in Windows Azure
   – Etc.

Deployment & Installation

Hans-Petter Halvorsen

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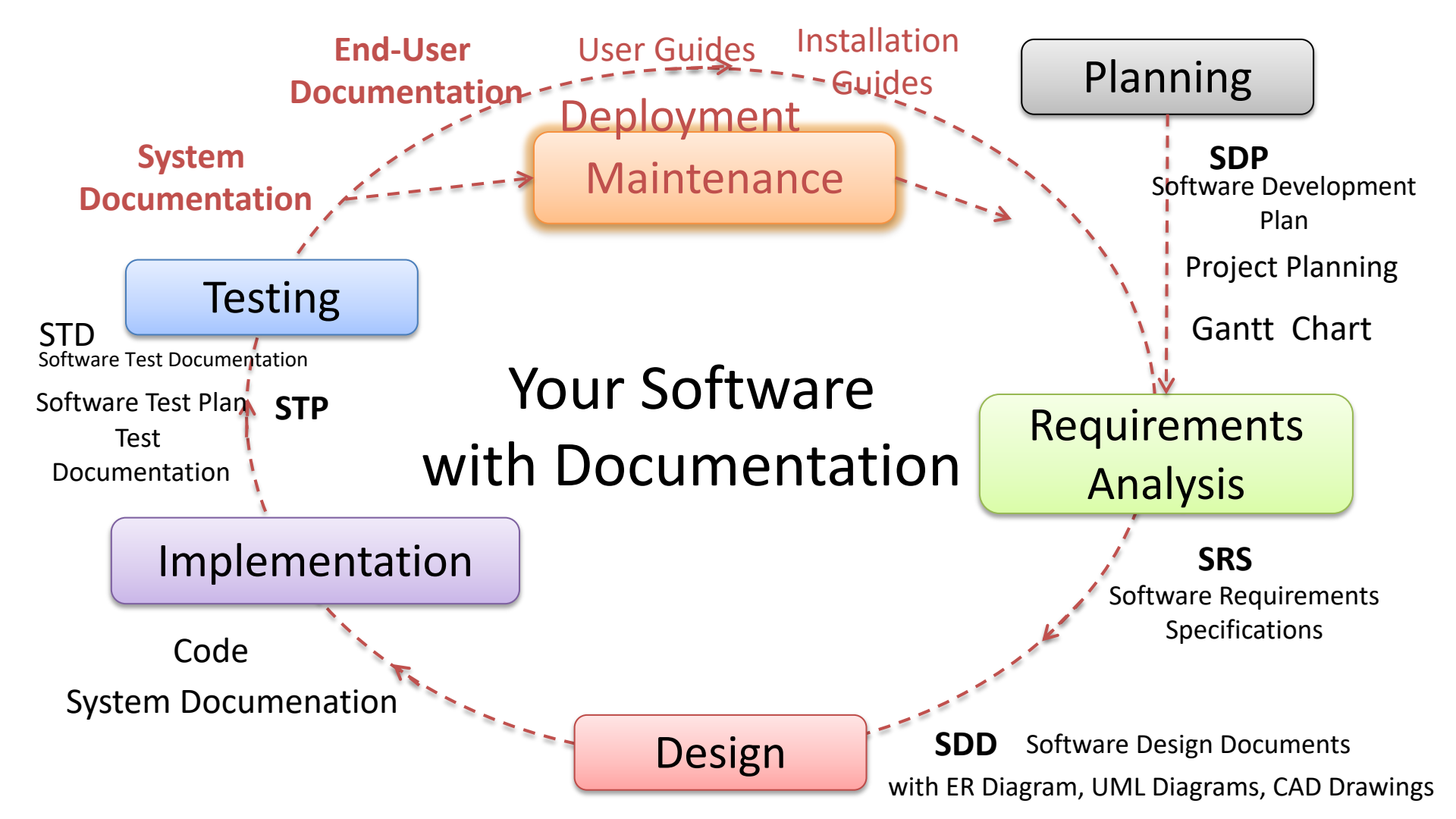

End-User Documentation
User Guides
Installation Guides
Planning
Deployment
Maintenance
System Documentation
SDP
Software Development Plan
Project Planning
Gantt Chart
Testing
STD
Software Test Documentation
Software Test Plan
Test Documentation
STP
Your Software with Documentation
Requirements Analysis
SRS
Software Requirements Specifications
Implementation
Code
System Documenation
Design
SDD Software Design Documents
with ER Diagram, UML Diagrams, CAD Drawings

What is Deployment?

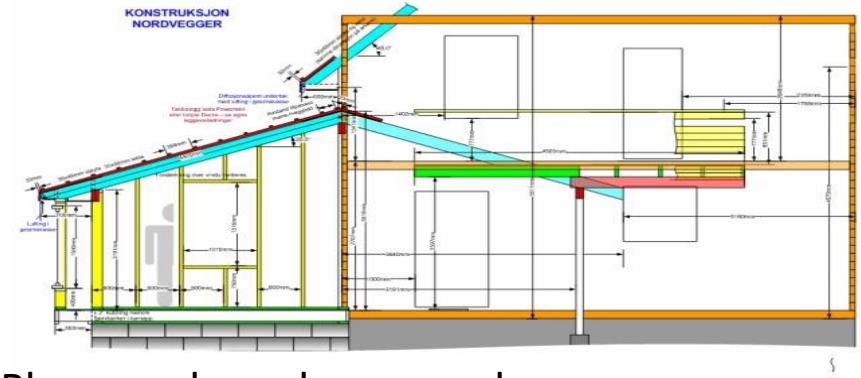
Software deployment is all of the activities that make a software system available for use.

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)

Requirements/Design



Plans made and approved

Alpha

Foundation finished, building structure started
A “proof” that you can do it, PoC (Proof of Concept)

Beta

Building structure finished,
Inside work on track

RC

Furniture, Flowers and
small adjustments missing

Deployment:
“Make the house ready for sale or move in”

RTM

Sammenligning: En eiendomsmegler er typisk en person som har fokus på “Deployment”. “Pynte brura”.

Ready for Sale or Move in

What is Deployment?

- **Getting software out of the hands of the developers into the hands of the users.**
- More than **50%** of commissioned software is not used, mostly because it fails at deployment stage.
  - The software is useless of you are not able to deploy it!
  - Many developers don't know how to do that!
  - Just like Testing, Deployment should be the focus during the whole project, from the beginning to the end.
- **80%** of the cost of (commissioned) software comes at and after deployment.

What are the issues that make it hard?
-> Try to give some examples!

http://www.inf.ed.ac.uk/teaching/courses/inf2c-se/Lectures/deployment.pdf

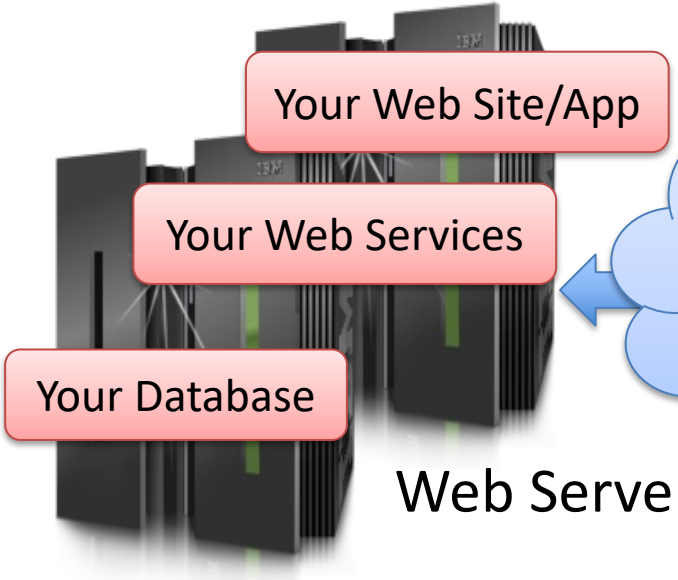
Key Issues around Deployment

- **Business Processes**: Most large software systems require the customer to change the way they work.
- **Training**: No point in deploying software if the customers can't use it.
- **Support**: The need goes on, and on, and on.
- **Deployment**: How do you physically get the software installed.
- **Equipment**: Is the customer's hardware up to the job?
- **Expertise**: Does the customer have the IT expertise to install the software?
- **Upgrades**: Can't avoid them! Difficult!!
- **Integration**: Shall the software interact/integrate with other systems of the customer.
- **Performance**: The Customer may not have the same hardware as in the Development/Test Environment

http://www.inf.ed.ac.uk/teaching/courses/inf2c-se/Lectures/deployment.pdf

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

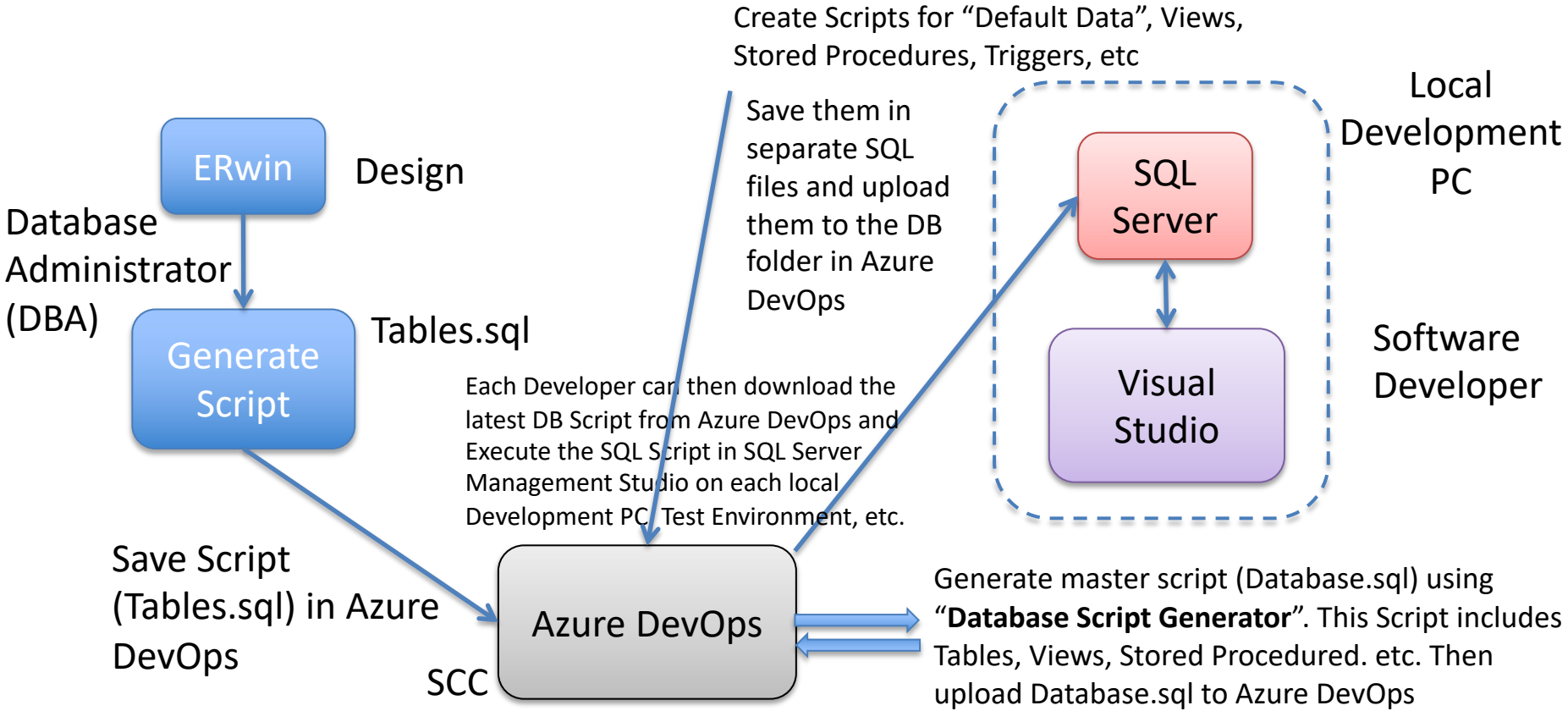
Cloud Services

Web Apps

Mobile Apps

Desktop Apps

Database Deployment

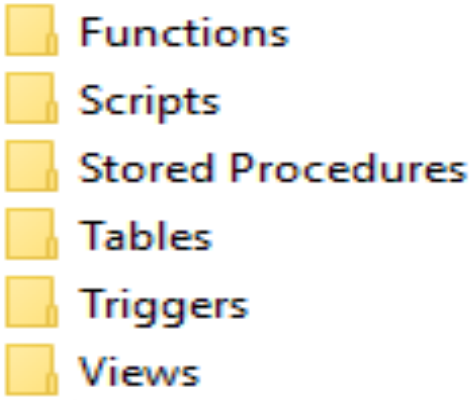


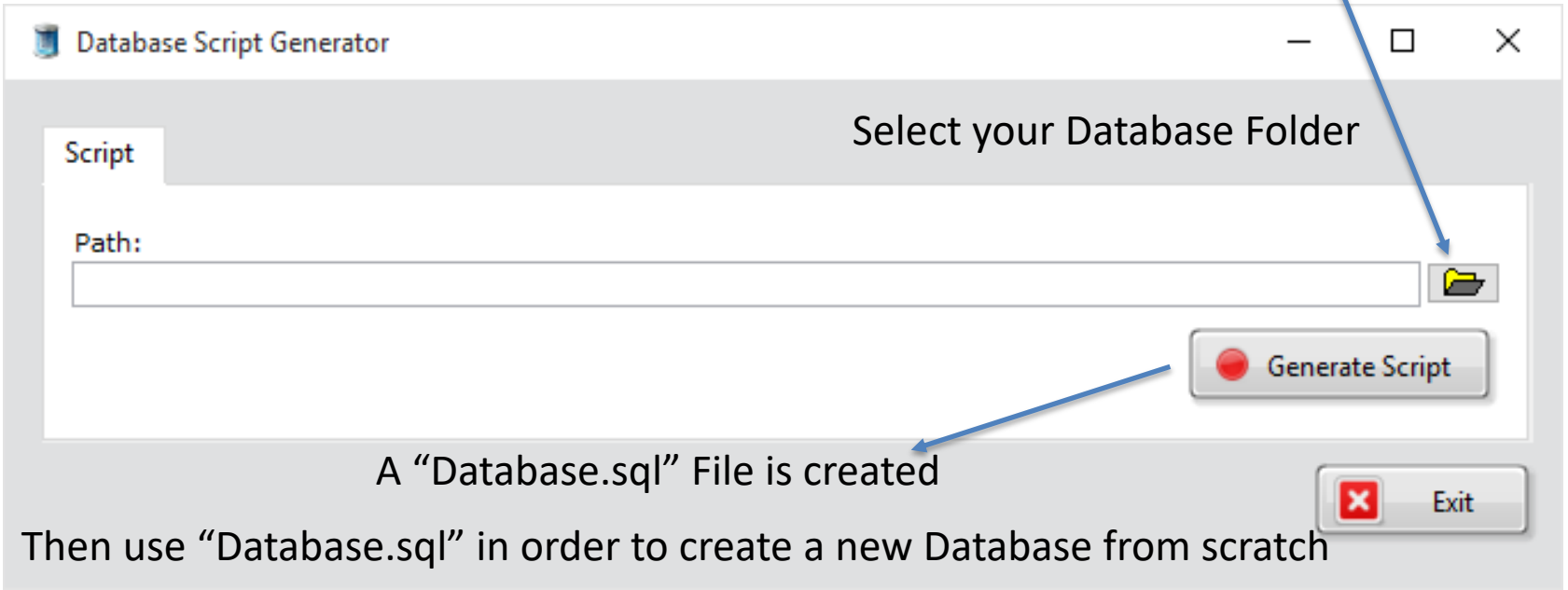
The DBA is in charge of maintening the DB Script that can be used on the Developer PCs and later deployed in the Customer Environment

Database Script Generator

Used to generate a master SQL Script including Tables, Views, Stored Procedures, etc.

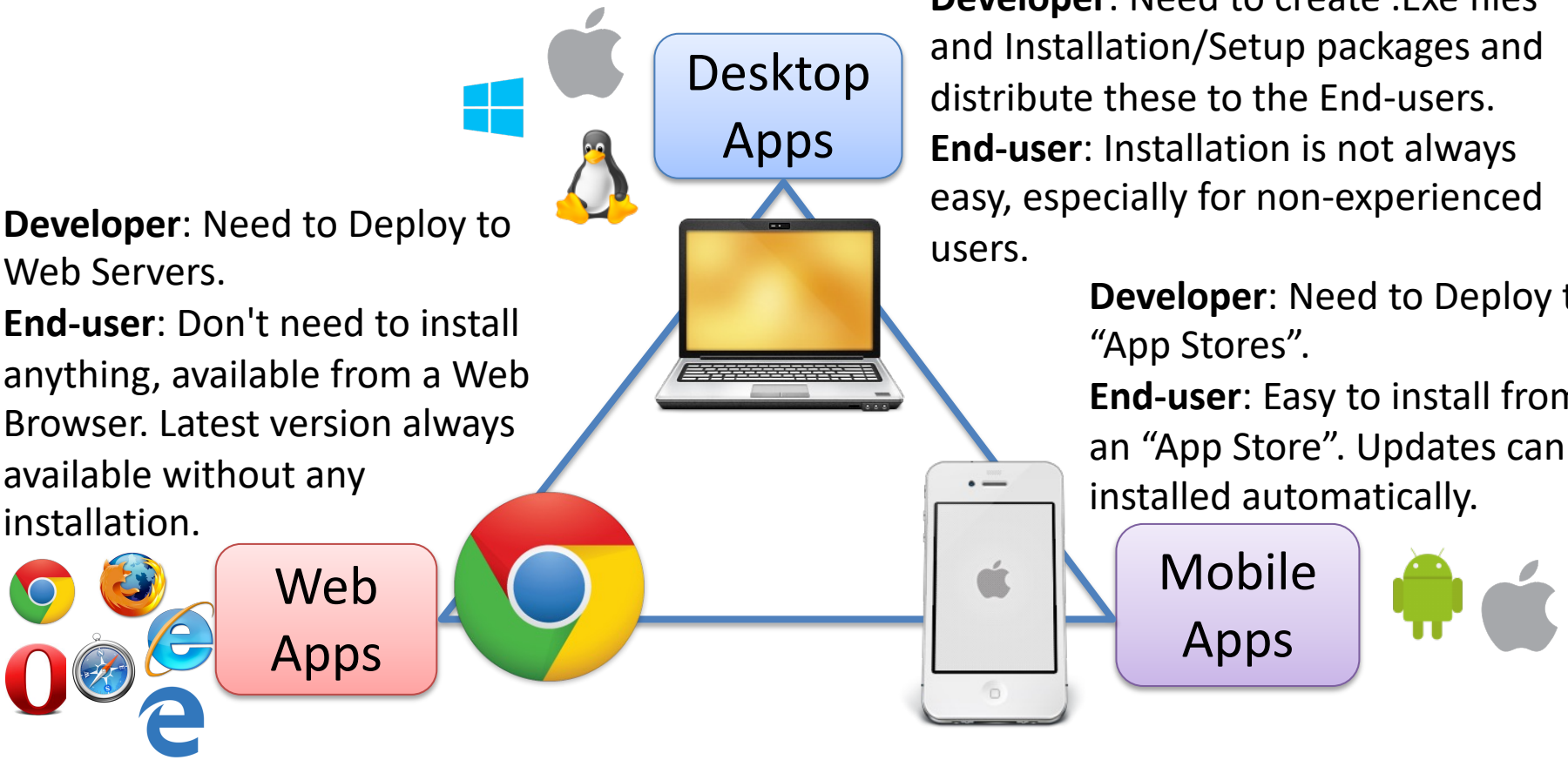
(Free Download)





Then use “Database.sql” in order to create a new Database from scratch

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-experienced 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.

Setup & Deployment

Different Deployment/Installation preparations required depending on what type of Apps you are Developing.

Desktop Apps

- **You need to create an .exe file and a Setup Package**
- Setup packages can then be distributed on CDs/DVDs or downloaded from a Web Page, etc.
- You use the Setup in order to install the software on all the clients
- Time consuming, cumbersome, depends on local components that might not be installed, version conflicts, etc. This makes it difficult (and a lot of work and testing) to create robust setup packages
- Mac: You can deploy to Mac App Store, Windows 10: You can deploy to Windows Store

Web Apps

- **No client installation needed!**
- **Installation on a Web Server (IIS, Apache)**
- Accessed on the Clients using only a Web Browser
- Easy, simple to deploy new versions, bug fixes, etc. (Customer don't need to do anything)
- But make sure you App supports all major Web Browsers (Internet Explorer, Chrome, Firefox, Opera, Safari)

Mobile Apps

- Deployed to "**App Stores**" like Apple App Store, Google Play, Windows Store

Server-side (Database, Web Services, etc.)

- Typically a setup package that installs this, or manually if it is a tailor-made solution

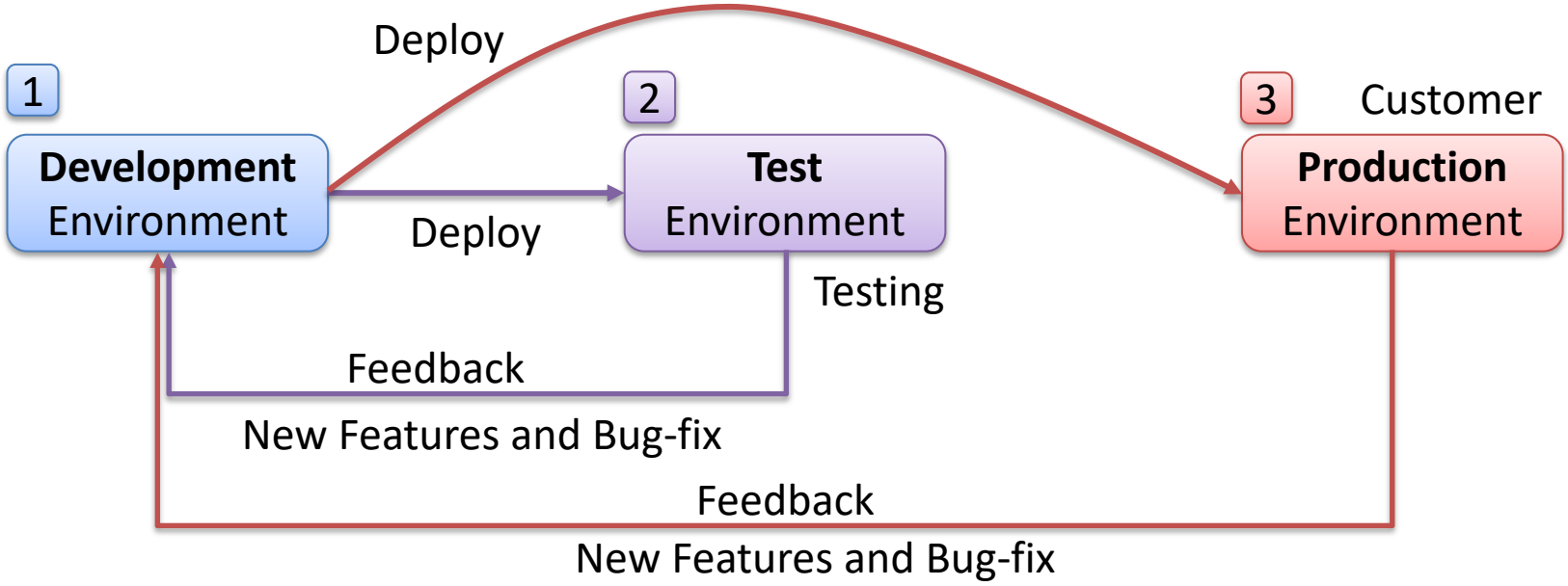
Deployment

Is it a Generic Software Product or a Tailor-made Software Solution?

- Different Deployment/Installation preparations required!!

- Generic Software:
  - Many Customers
  - The Customers install the Software itself
- Tailor-made:
  - Typically only one Customer
  - The Developer Company typically installs the software (at least server-side components)
  - If many Desktop Clients: A Setup is required

Deployment



Test Environment can be a local server, a virtual machine, or in the cloud

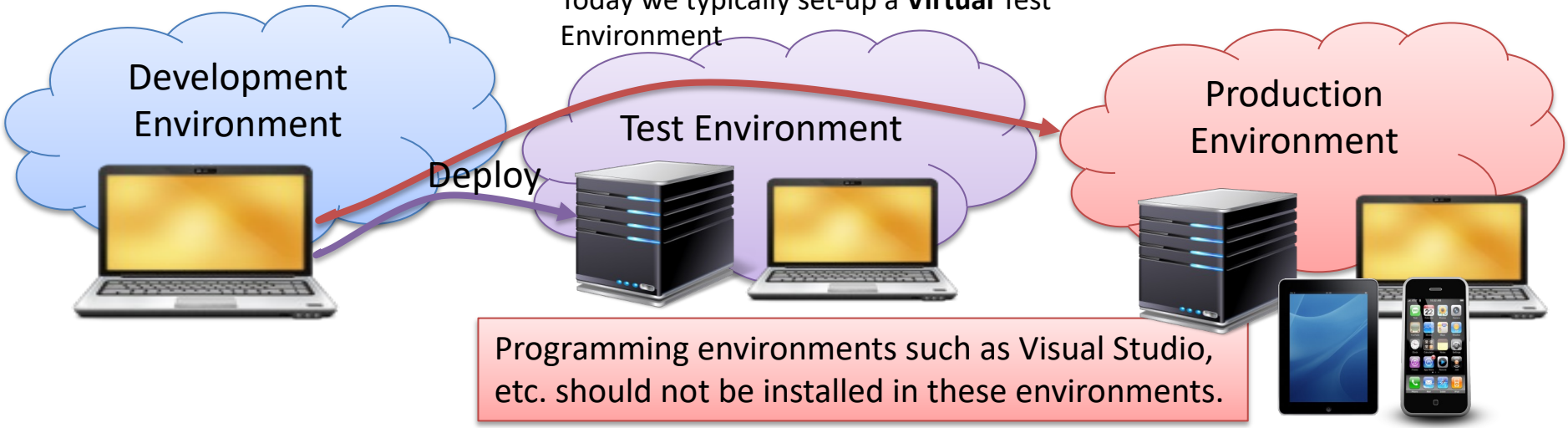
Production Environment can be a server located at the Customer, a virtual machine, or in the cloud

Deployment

Typically the Developers Personal Computer with Database, Web Server and Programming Software

A Clean PC/Server (or a network with PCs and Servers) where you install and test your Software.
Today we typically set-up a **Virtual** Test Environment

The Customers environment where you install the final software (Servers and Clients)



Programming environments such as Visual Studio, etc. should not be installed in these environments.

Development vs. Maintenance

Development	Maintenance
Application is in the Development/Test Environment	Application is already into the Production Environment
End user is not using the system	End user started using the system
It is not driven by the end users. It is driven by the project team	It is completely driven by the end users
Opportunity for innovation is more	Opportunity for innovation is less
Time frame to fix bugs are well framed	Time frames to fix bugs are not well framed and it varies depending on the nature of the bugs
Team has freedom to decide what is necessary for the situation	Team may not have such freedom and constraint by the production system and end-user preference
Defects have no immediate effect on the production system	Defects may disrupt production system if not addressed properly
Developing a new system from the scratch is something unique	Maintenance activities are mostly repetitive in nature

Reference: Dutt, Saikat, et. al.(2015). *Software Engineering*. Available: Safari Books Online

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Desktop Deployment

Deployment of traditional Desktop Applications

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Desktop Deployment

- You need to create an .exe file and a Setup Package
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- You use the Setup in order to install the software on all the clients
- Time consuming, cumbersome, depends on local components that might not be installed, version conflicts, etc. This makes it difficult (and a lot of work and testing) to create robust setup packages
- Mac: You can deploy to Mac App Store, Windows 10: You can deploy to Windows Store

Setup Creation Software

FLEXERA SOFTWARE™
InstallShield®

- **InstallShield** Professional/Premium
  - InstallShield is a professional software for creating installers, Price €2000+
  - InstallShield Limited Edition is included with Visual Studio
- **WiX Toolset** (Windows Installer XML) (Free)
  - Used to create Windows Installer packages ("MSI files)
  - The WiX toolset builds Windows installation packages from XML source code.
  - Free and Open Source
  - Used by e.g., Microsoft to create Setup packages for Office, SQL Server, Visual Studio, etc. Apple, etc. also use it.
- **Inno Setup**
  - Free of charge Installer for Windows programs
- **NSIS** (Nullsoft Scriptable Install System)
  - Professional open source system to create Windows installers.
- etc.

Desktop Deployment

Nå forsvinner .exe – slik er den nye måten å installere Windows 10-programmer på

Av Trond Bie, 31. mars 2016 kl 08:58

SILICON VALLEY **(ITavisen): Endelig over og ut for register-kaos og «DLL-helvete».**

Silicon Valley (ITavisen:) Microsoft dytter nå en helt ny måte å distribuere, installere og avinstallere (slik at utviklere ikke behøver å skrive egne avinstallasjonsprogrammer) og ikke minst *oppdatere* all kommende Windows 10-programvare mye enklere enn i dag.

Følg med på alle Build 2016-avsløringene.

På alle enheter
«Universal Windows App Model» støtter PC-er, mobiler, IoT, HoloLens, nettbrett og Xbox.

.Exe-tiden er over, .appX er fremtiden for alle enheter med Windows 10-kjerne.

Det har vært bråk rundt den nye modellen, men Microsoft forsikrer oss om at dette er et åpent økosystem. Du kan installere .appX-programmer som ikke kommer fra Microsofts egen butikk, *men appen må signert av en sertifisert kilde.*

http://itavisen.no/2016/03/31/na-forsvinner-exe-slik-er-den-nye-maten-a-installere-windows-10-programmer-pa/

https://www.halvorsen.blog

Web Deployment

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

Hans-Petter Halvorsen

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Web Deployment

Servers

Web Servers

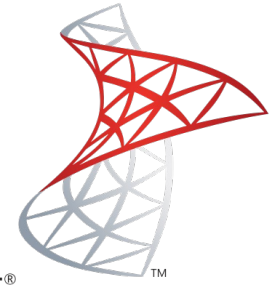
Database Servers

The Cloud/
Internet/
Local Network

Clients

PCs with Web Browsers

Database Platforms



Microsoft® SQL Server®

ORACLE®

MySQL®

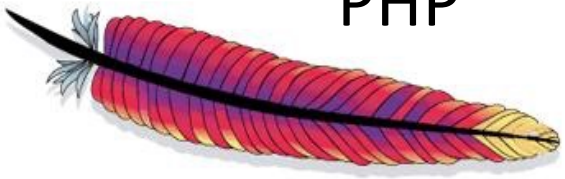
mongoDB

MariaDB

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.

Cloud Hosting

(Cloud Deployment of the Server-side parts of your system)

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 Methods

1. Use “**Web Deploy**” feature in Visual Studio in order to transfer files and settings to the Server
2. Use standard **FTP**, e.g., WinSCP software, in order to transfer Files to Server

Deployment of your Applications

Hans-Petter Halvorsen

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Deployment

- Deploy and Install your Applications

See Next Slides for more details...

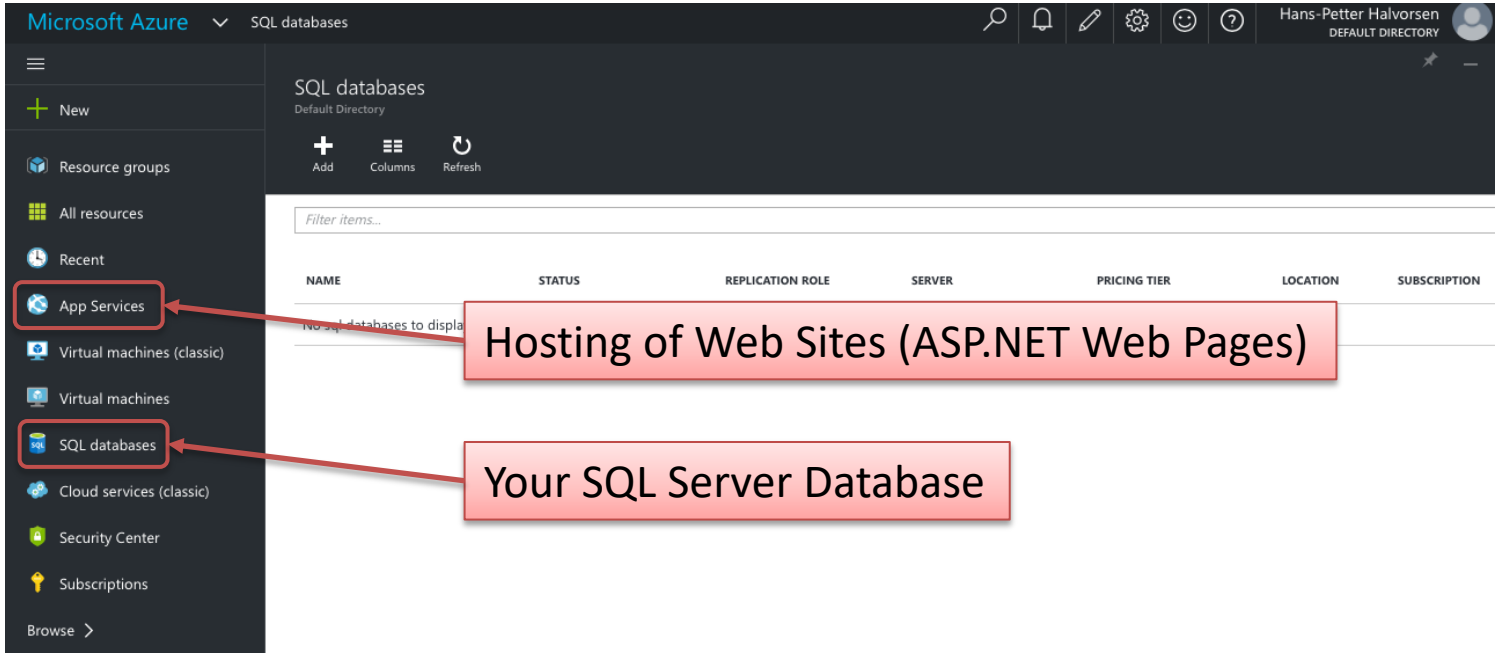
Deployment

- Server-side Software
  - If the Customer don't want to host the Software system by them self
    - Alt 1A: Use Cloud Hosting
  - If the Customer want to host the Software system by them self
    - Alt 1B: Create Executables/Setup packages
- Client-side Software
  - Alt 1A: Create Executables/Setup packages

Windows Azure

Deployment to Microsoft Azure

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



Necessary Steps

1. Create a SQL Server Database using the Azure Portal
2. Create ASP.NET Project in Visual Studio
3. Create an **App Service** using the Azure Portal
4. Deploy ASP.NET Web Site using Deploy Wizard in Visual studio

Create Executable/Setup Package

- Create executable files for your application(s) (if you need it). Note! This may not be applicable for all of your apps, e.g. a web site.
- **Create a Setup** (if you need it, else you should e.g., explain what steps needed to install you software manually in the Installation Guide) to make it easy to install the software in a Test Environment or a Production Environment.
- Use the built-in features in the IDE you are using or a separate installation package software, e.g., InstallShield.

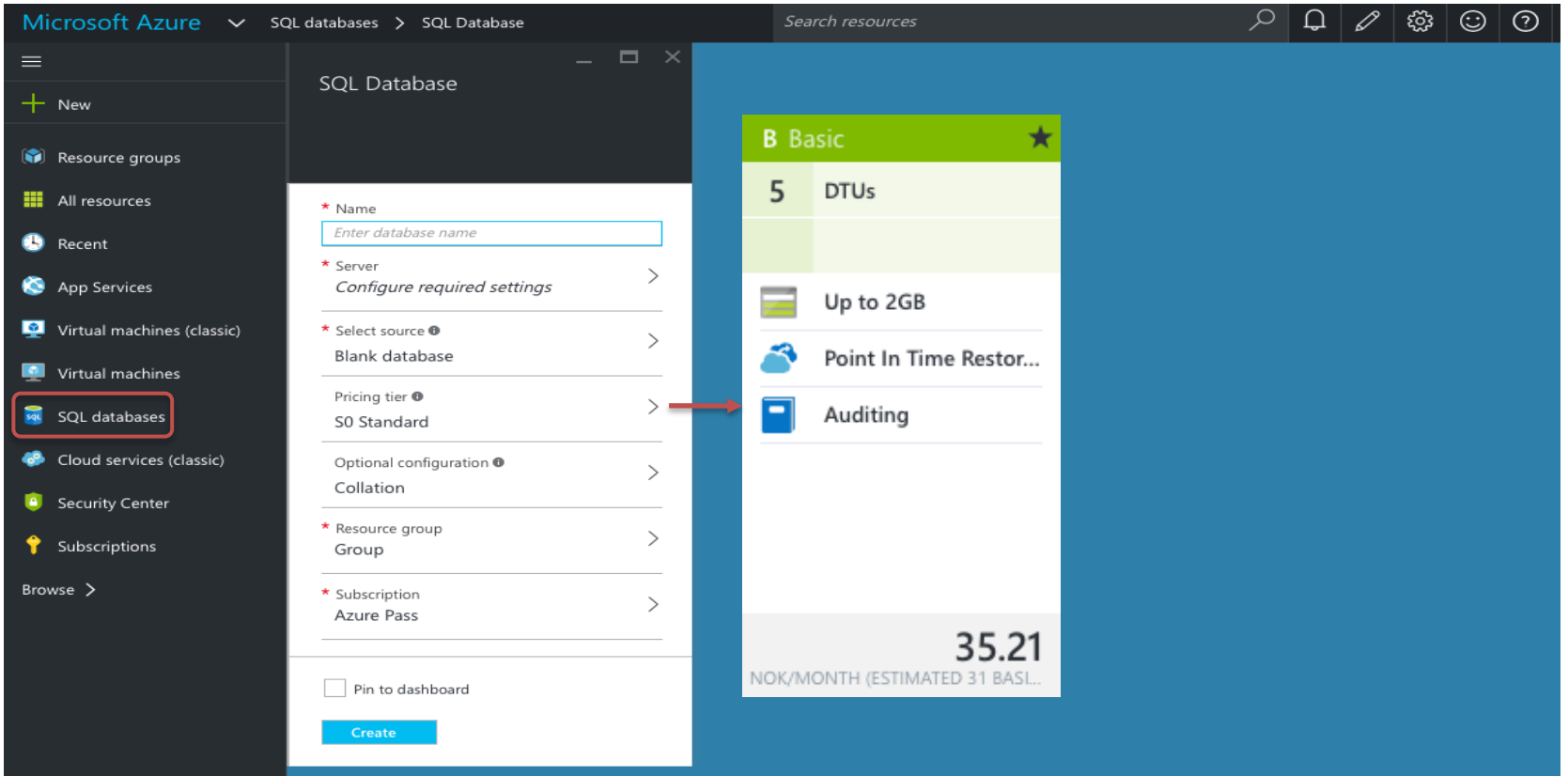
See Next Slides for more details...

Setup & Deployment in **Visual Studio**

- **InstallShield Limited Edition** (InstallShield Professional is a professional software for creating installers, Price €2000+)
  - Tool for creating setup packages
  - "Included" (free), but needs to be enabled and downloaded
  - Integrates with Visual Studio (Prof. ed can be used independently)We will
- **WiX Toolset** (**W**indows **I**nstaller **X**ML)
  - Used to create Windows Installer packages ("MSI files)
  - Can be used in Visual Studio or independently
- **ClickOnce Deployment**. Publishing Desktop Apps to a Web Server. Users can then install them with a single click.
- Deployment to **Windows Azure** ("Windows in the Cloud"). Monthly Payment
- **Web Apps (Web Deploy)**
  - Create a “Web Deployment Package” which can be imported using IIS
- Mobile Apps: Windows Store Apps
  - Built-in Deployment inside Visual Studio to Windows Store

Database

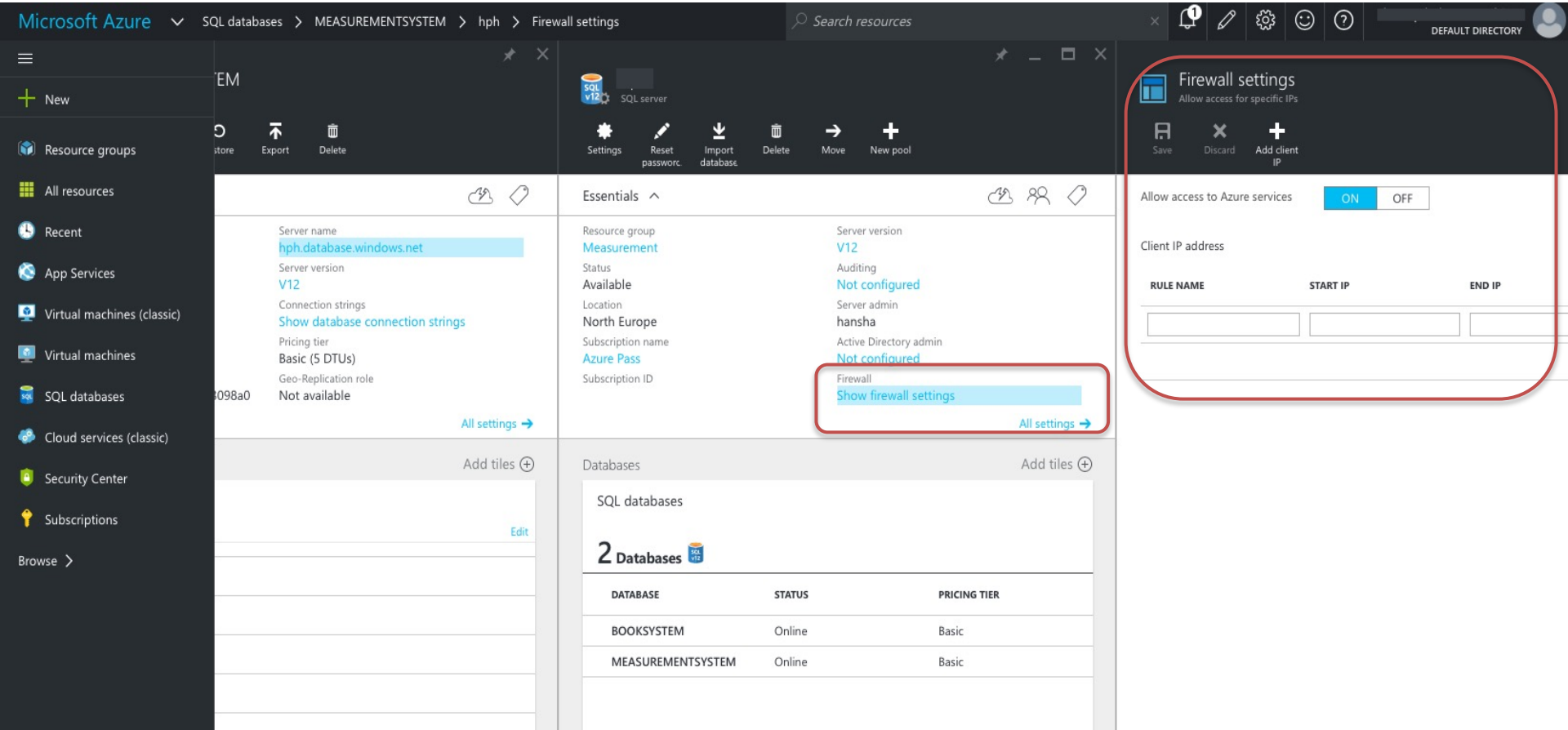
Create SQL Server Database in Windows Azure



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

1. Configure **Firewall** Setting in Azure Web Portal
2. Your local Management Studio: You connect to the Windows Azure SQL Server Database in the same way as you connect to a local Database
3. Create Tables, Views, Stored Procedures, etc. -> using a SQL Script is recommended!

Firewall Settings



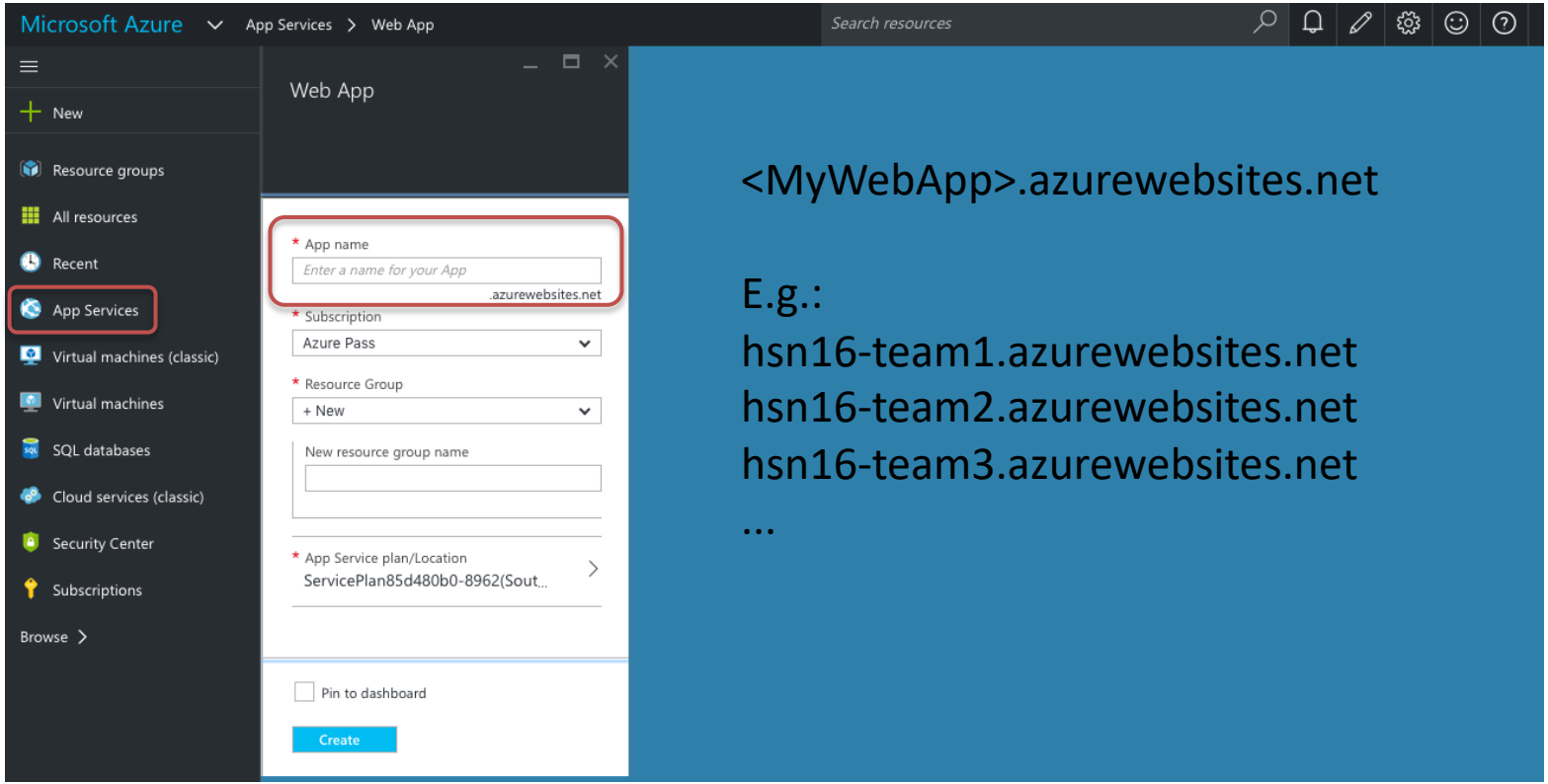
Azure Data Studio

- You can also use Azure Data Studio
- Azure Data Studio is a cross-platform (Windows, macOS, Linux) down-scaled version of SQL Server Management Studio (Windows only).

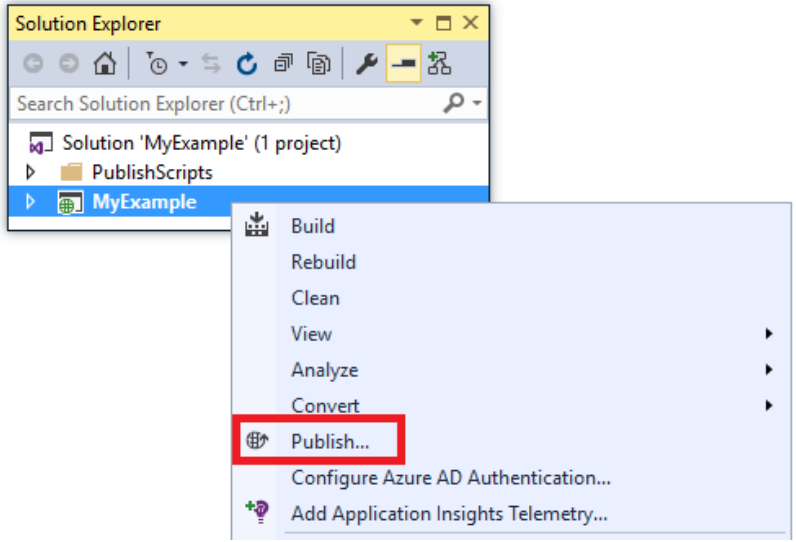
Web Site

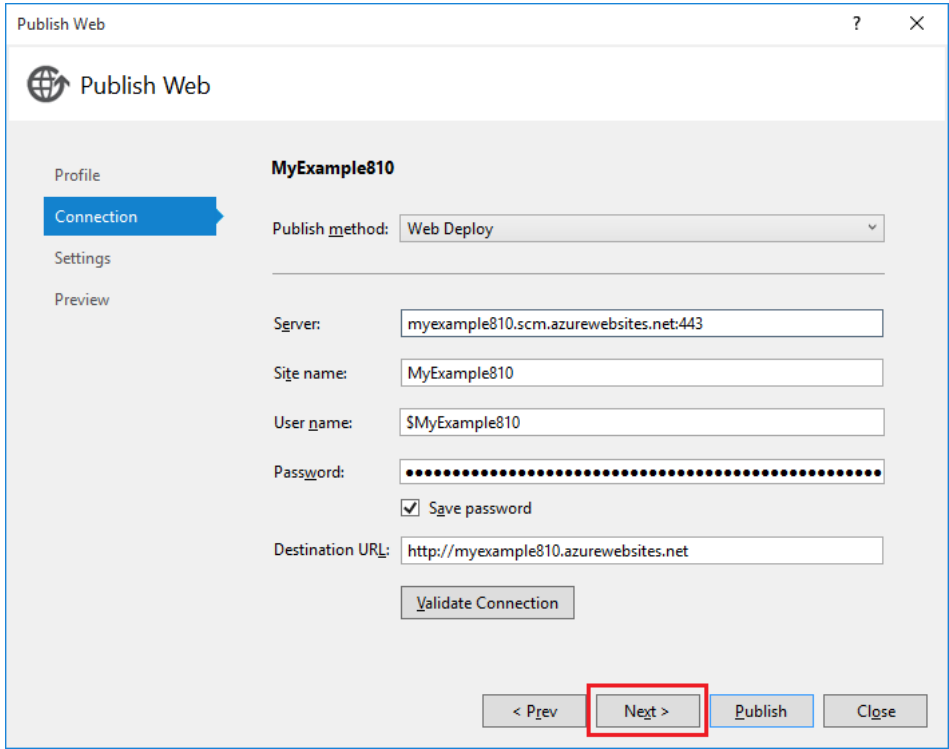
Windows Azure: “App Service”

Create App Service from Azure Portal

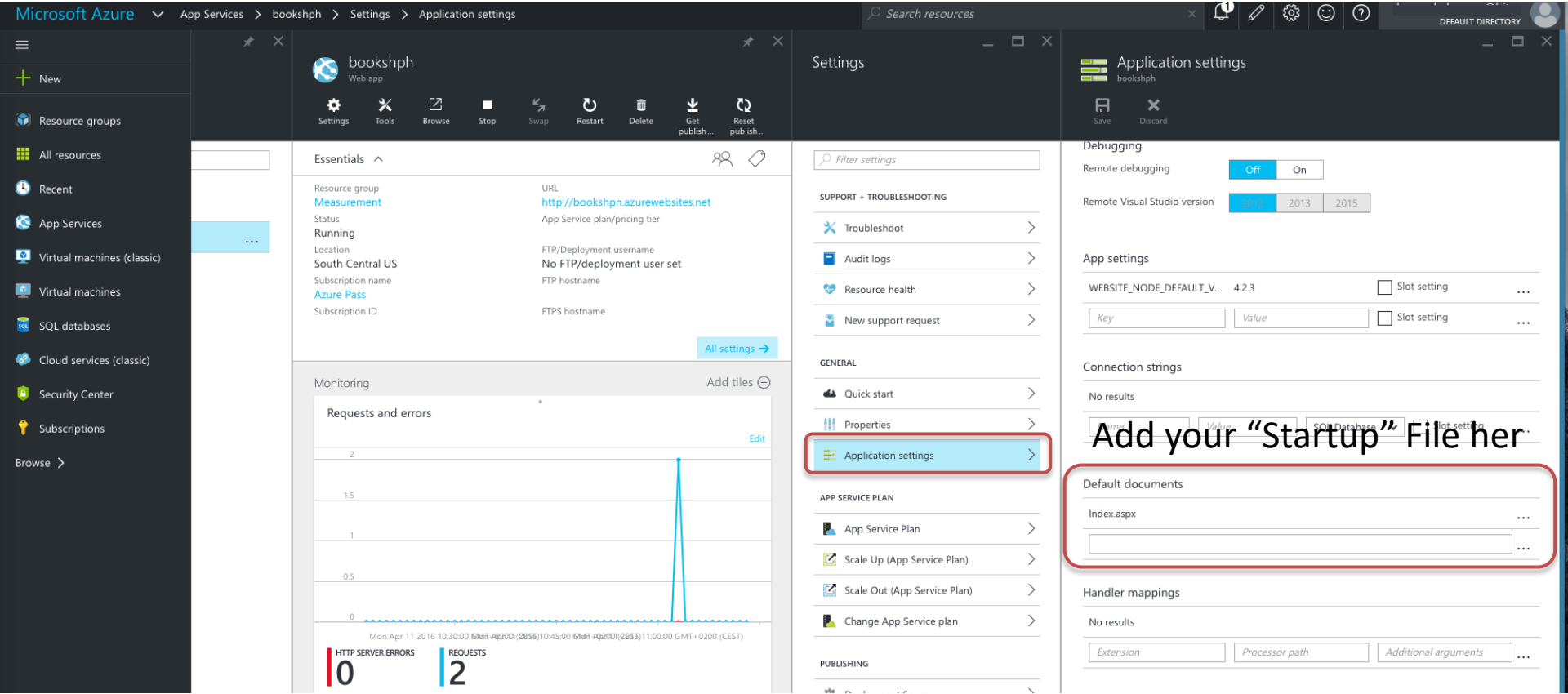


Deploy the Web Project to the Azure Web App from Visual Studio





Configure Default Document



Installation Guide

Hans-Petter Halvorsen

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Installation Guide

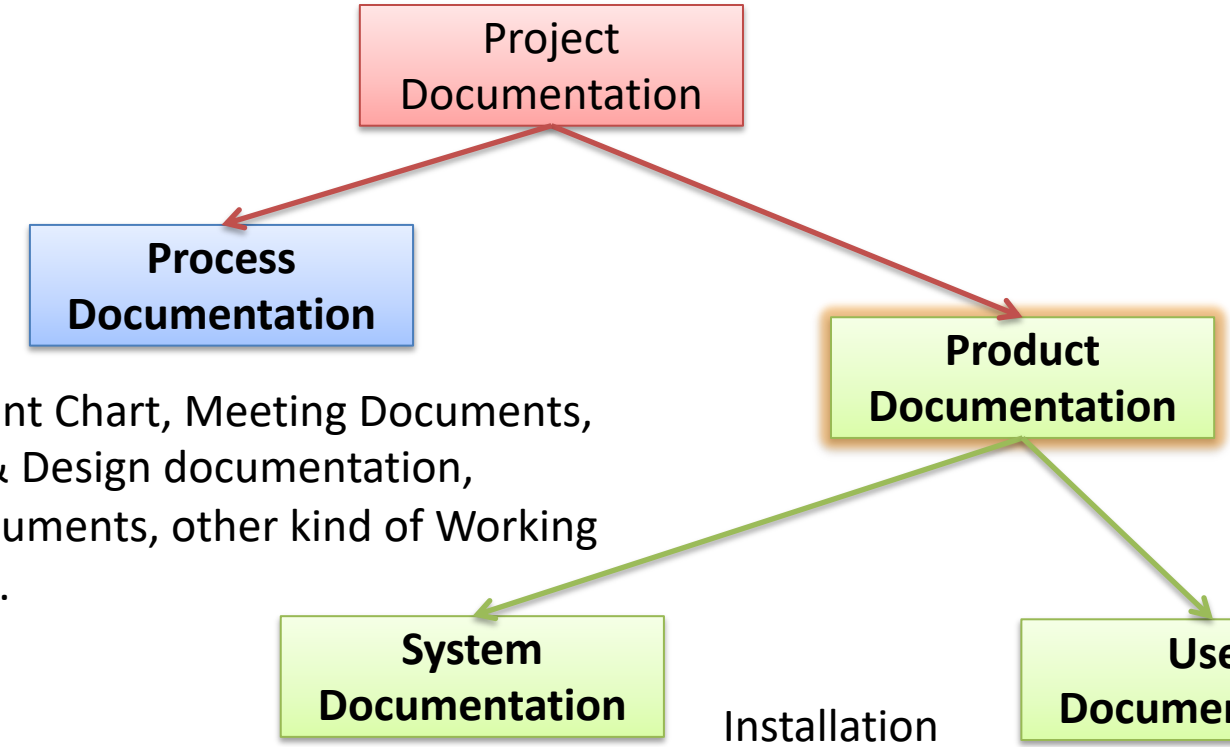
- Create Installation Guide(s) -> **Video(s)**
- It can be a separate document(s), or you can choose to integrate it in the User Manual(s) or the System Documentation
  - We should make Video(s)
- Server-side installation (done by IT people) & Client Installation (end-users, non-IT people)

See Next Slides for more details...

Installation Guide

- You have installed a Demo of your system in Microsoft Azure
- The purpose with this Demo is to make it possible for possible buyers of your system to Test and Evaluate your Software.
- When/If the Customer buys your Software, they may want to install it either on their own Server(s) or in a cloud platform like Microsoft Azure or other Cloud vendors

Software Documentation Categories



Project Plan, Gant Chart, Meeting Documents, Requirements & Design documentation, Emails, Test documents, other kind of Working Documents, etc.

Technical Documentation needed in order to maintain the software, etc.

Installation Guides

User Manual, Wikis, Online Help, etc.

Installation Guide

- Prerequisites – What need to be in place before you start the installation, e.g., OS version, Drivers, .NET Framework, ...
- Where do you find the Installation Files/packages
- Step-by-step Guide of how to install the Software (Text + Figures)
- How do you start your Application(s) when you are finished with the installation
- How do you uninstall the software
- ...

HTML Web Site

Hans-Petter Halvorsen

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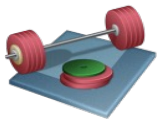
HTML Web Site

Cont. with the Software Product Web Page with

- Presentation/overview of the Software Product (Text + Image(s))
- Downloadable **Documents** (**PDFs**) (Hyperlinks)
  - SDP, SRS/SDD, STP, Test Documents, System Documents, User Guide(s), Installation Guides(s)...
- Downloadable **Software** (Installation Files?) and/or **Link to Cloud Hosting (Web Site hosted in Windows Azure)**
- Downloadable **Azure DevOps contents** (everything!) as a ZIP File – or just a link to the Azure DevOps Project
- Embed the Videos created

See Next Slides for more details...

Web Site Example

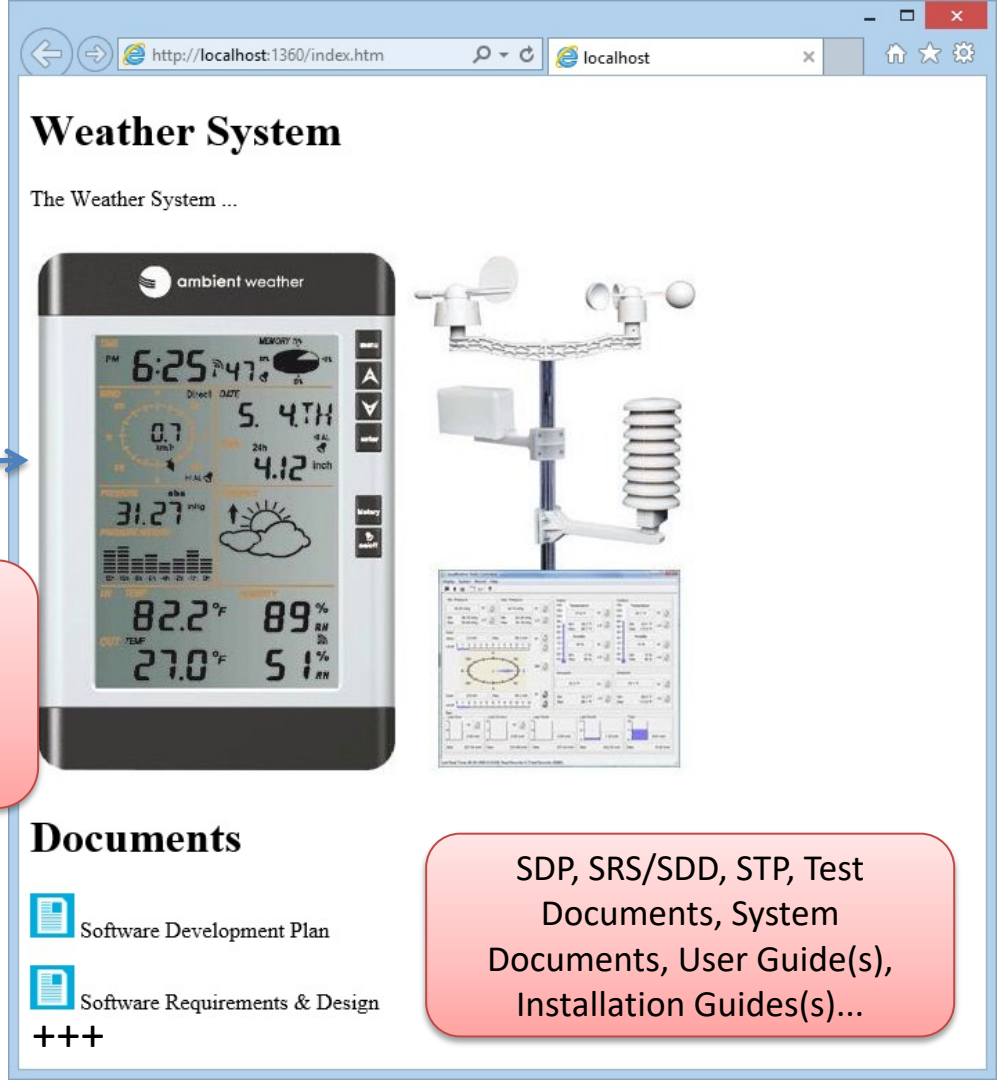


Create a similar Web Site for your Product

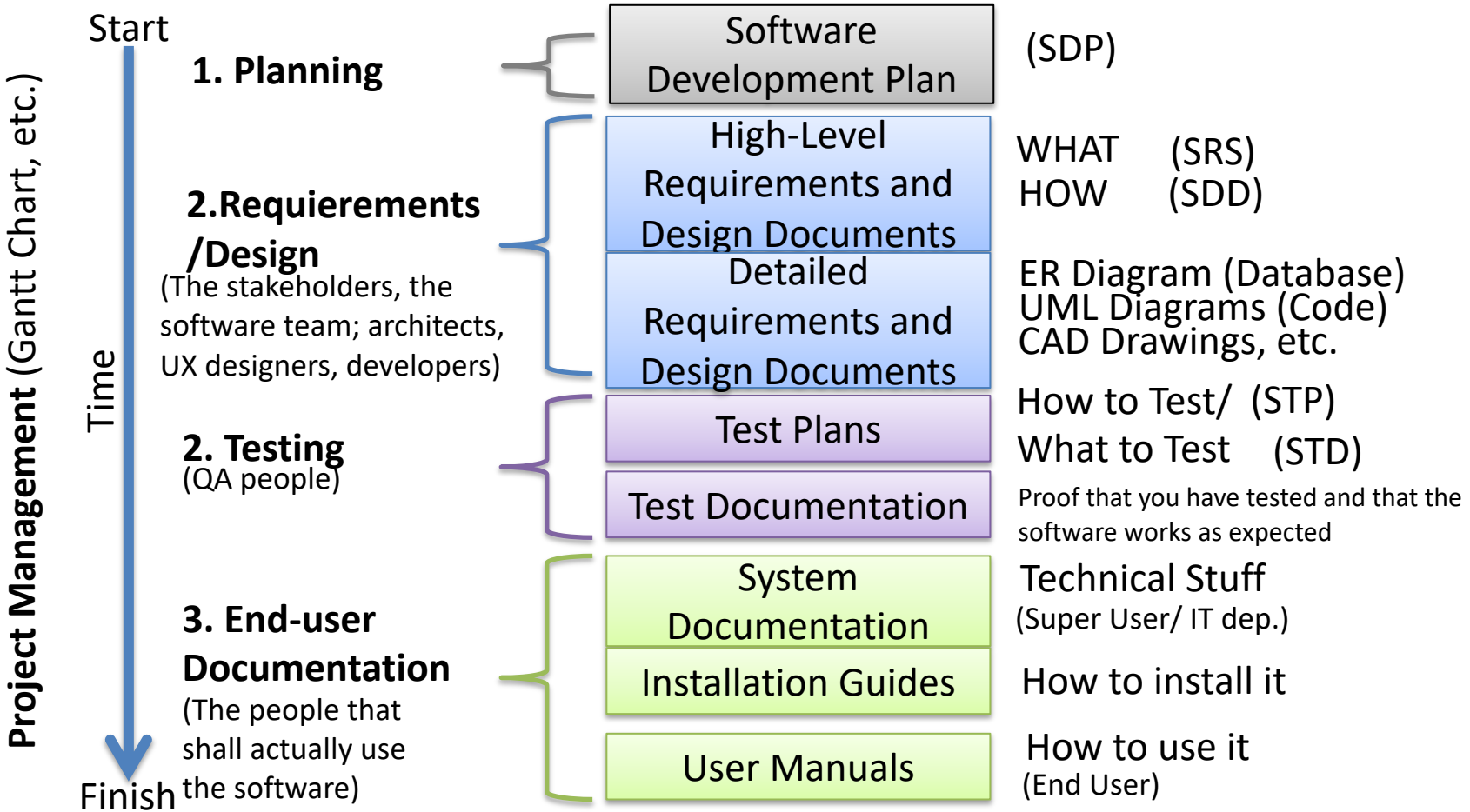
Presentation (Figures and Text) of your Software Product

Note! We should use only HTML (not ASP.NET! – because the Web Server we are using at school dont support it).
In addition you may use JavaScript, CSS, PHP

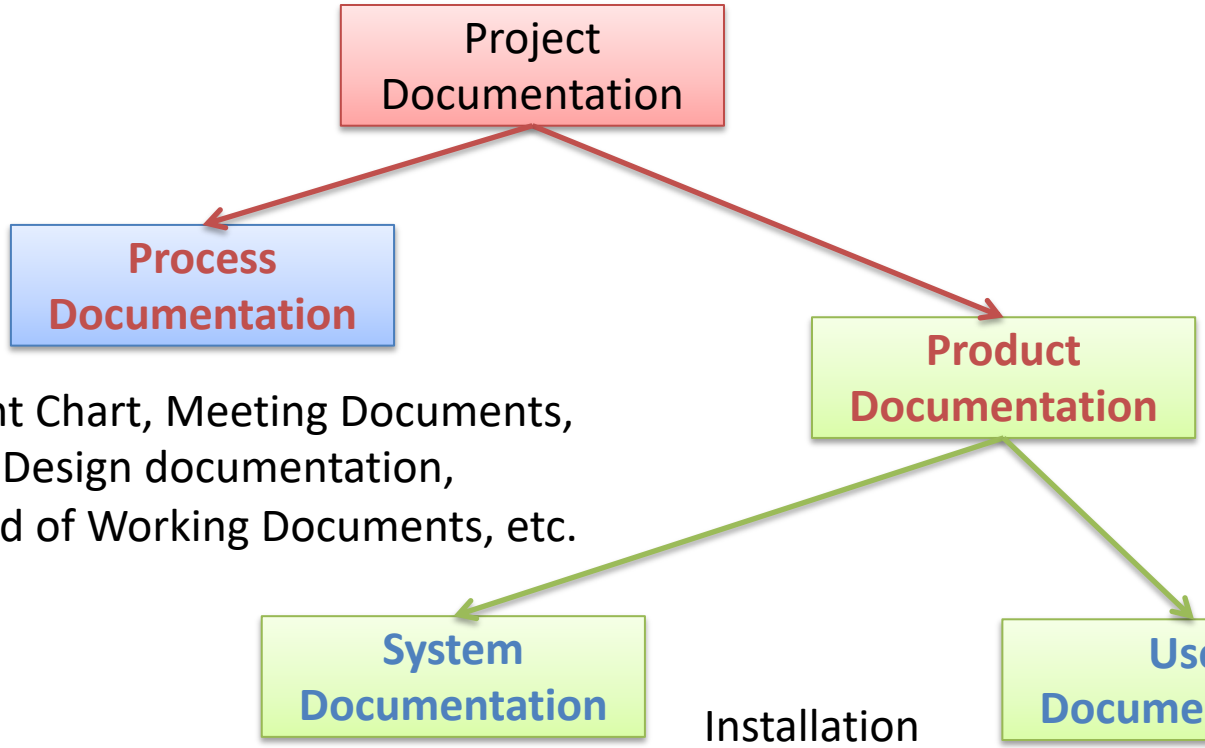
Documents and Software available for download (Hyperlinks)



Typical Software Documentation



Software Project Documentation Categories

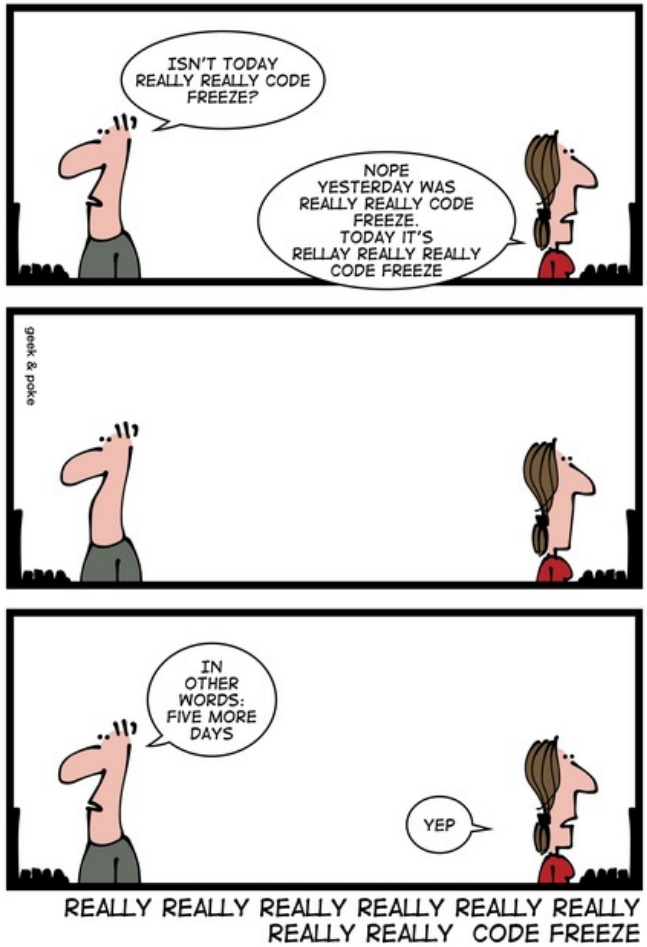


Project Plan, Gant Chart, Meeting Documents, Requirements & Design documentation, Emails, other kind of Working Documents, etc.

Technical Documentation needed in order to install, maintain the software, etc.

Installation Guides

User Manuals, Wikis, Online Help, etc.



http://geek-and-poke.com

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