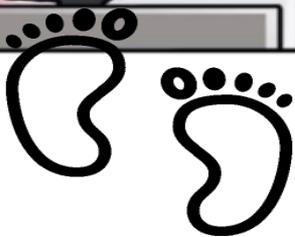
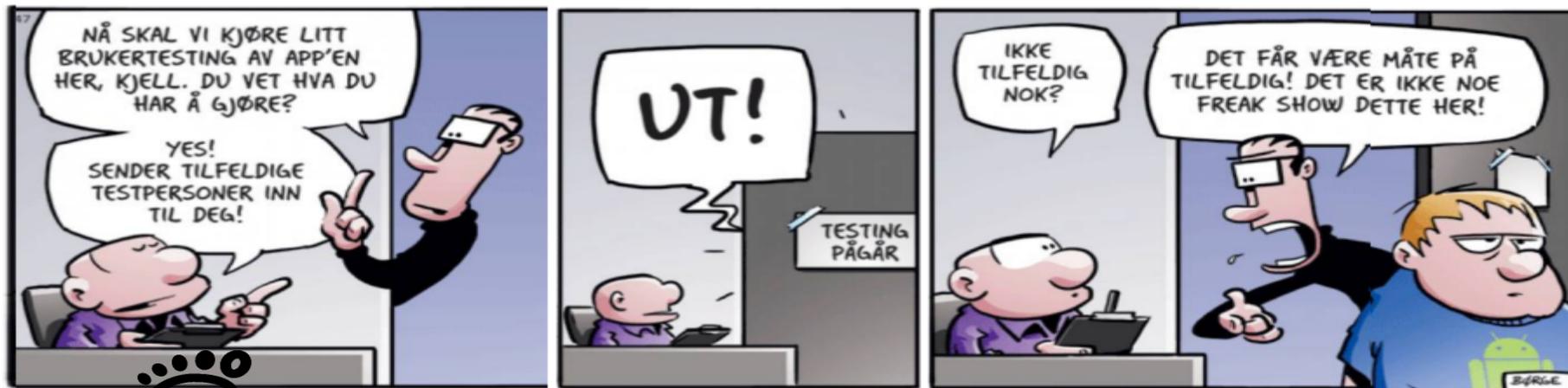


Create a Virtual Test Environment



Step by Step Exercises

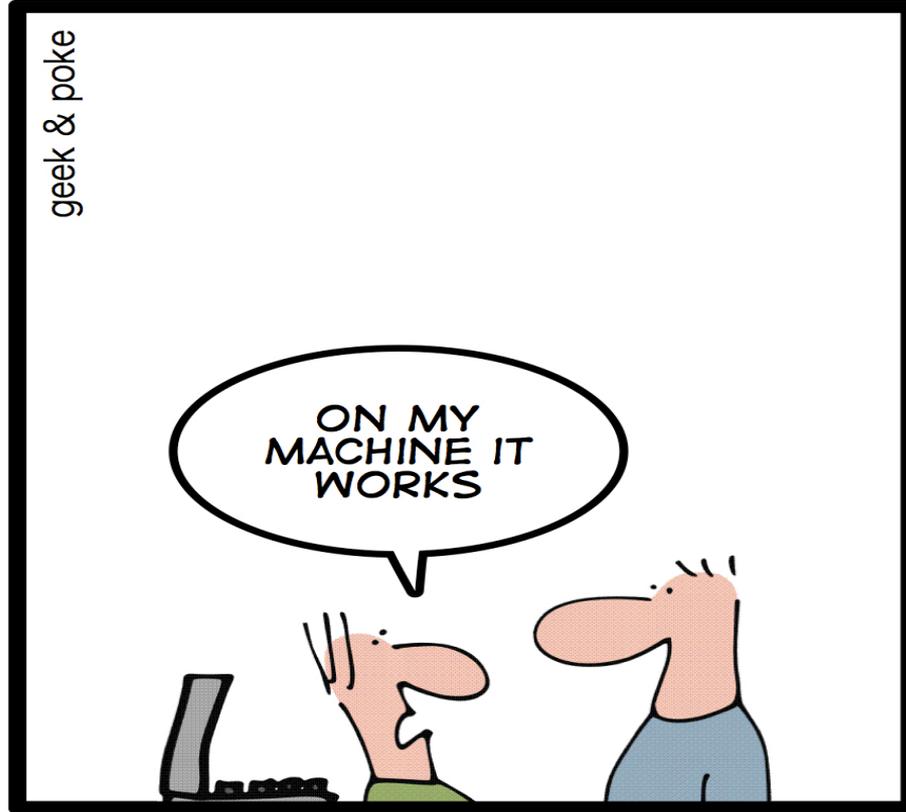
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Why Do We Need a Test Environment?

Why cant we just use our own PC?

*JUST IN CASE YOU'RE STILL NOT
SURE WHETHER YOU'RE IN A
SOFTWARE PROJECT*

WAIT UNTIL YOU HEAR THIS:



Why Test Environment?

- “It works on my PC” says the Developer
- Clean Environment
- On the Developers PCs we have all kind of Software installed that the Customer dont have, e.g. Development Tools like Visual Studio, etc.
- We need to test on different Platforms and Operating Systems
- Customers may use different Web Browsers
- Deployment: Test of Installation packages
- Make the software available for Testers
- etc.



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

Development Environment



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**

Test Environment



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

Production Environment



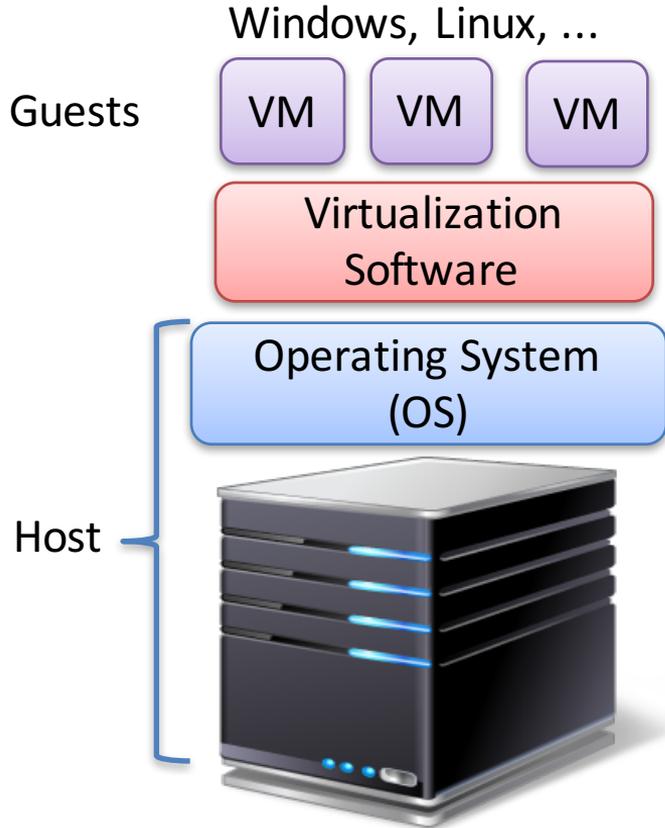
Programming environments such as Visual Studio, etc. should not be installed in this environment. You need to create .exe files etc. in order to make your software run.

Virtualization Software

A lot of Virtualization Software exists. Here are some examples:

- **VMware Workstation Player** (We will use this in this exercise)
- VMware Workstation
- VMware vSphere
- VMware Fusion (Mac)
- Parallels Desktop (Mac)
- Microsoft Hyper-V
- VirtualBox
- etc.

Virtualization



VM = Virtual Machines

Hardware
(Computer)



A Hypervisor can run directly on the computer without a Host OS

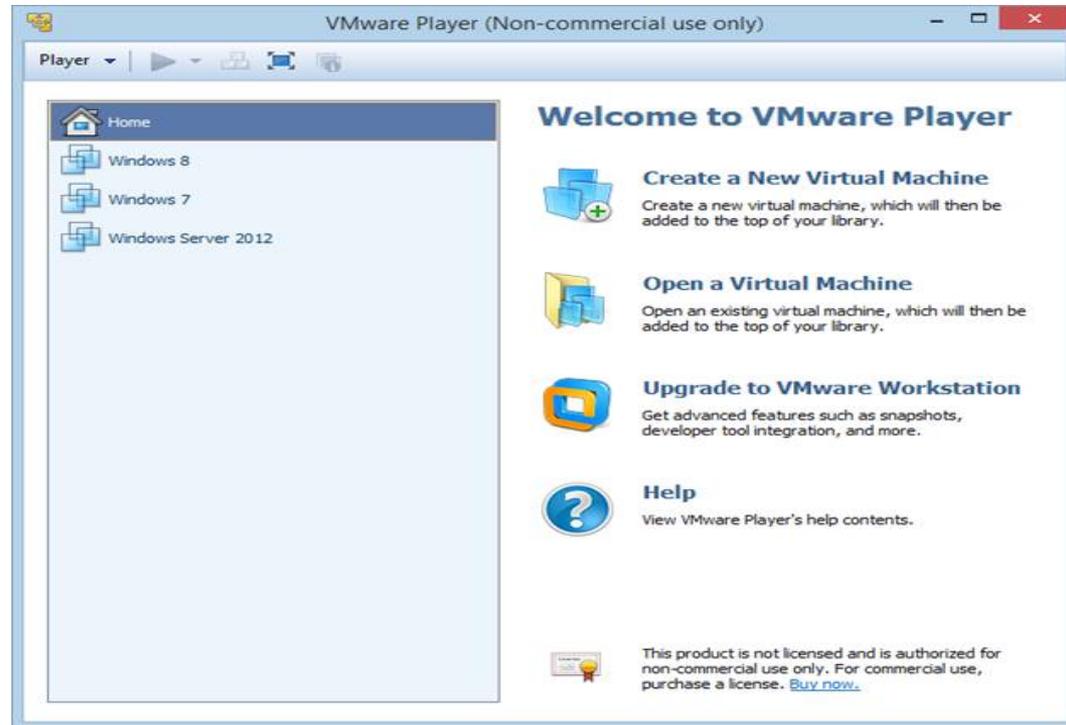
VMware Workstation Player

VMware Workstation Player is for personal use on your own PC. VMware Workstation Player is free of charge for personal non commercial use.

Note! Make sure you have enough free space on your harddrive!

VMware is a company that has been specializing within virtualization software.

<http://www.vmware.com>



Exercises

- Install **VMware Workstation Player** (or similar software)
- ...
- Download and Install **OS** (e.g., Windows 10) from DreamSpark
- Install/Configure Server Software, e.g.:
 - Install the **Database System** (SQL Server or other)
 - Configure the **Web Server** (IIS or other) (only if you create Web pages, etc.)
- ...
- Install **Your Software** (Database, Desktop App/Web App)
- Start Testing!

Software

1. Install **VMware Player**

- If you have 64bit OS: Install VMware Player 7
- If you have 32bit OS: Install VMware Player 6

2. Install **OS** of your choice inside Player

- Windows 7 or Windows 8.1 (choose different within the Team)

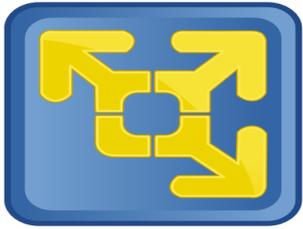
3. Install **SQL Server** Express with Tools inside your VM

- You may need to install .NET Framework 3.5 SP1 first

4. Install your Software inside your VM

1. Database Tables, Views, etc.
2. Your App

Note! Make sure you have enough free space on your harddrive!



VMWare Workstation Player



Step by Step

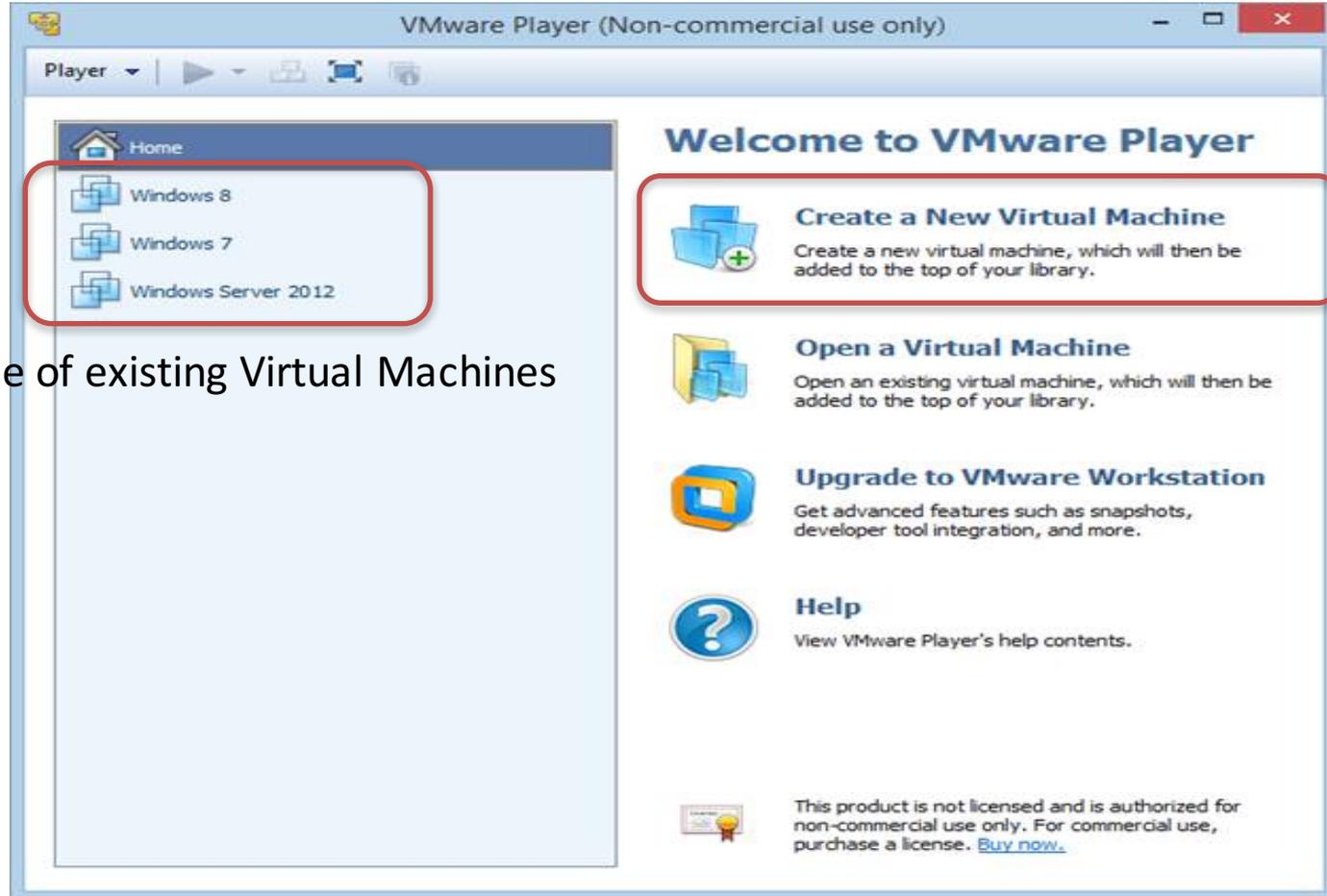
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VMware Workstation Player



- Download and Install VMware Workstation Player (or similar software)
 - Download and Install Software (.iso Files) needed from Dreamspark
 - Windows OS (e.g., Windows 10). Get License Key from DreamSpark
 - SQL Server (Express or Full version)
 - ...
 - **Note!** Developer Tools shall not be installed in Test/Production Environment!
 - Download other Software if needed
- ⇒ Make sure to keep all the software installation files in one place for next time
- ⇒ Make a copy of the VM for later use (“Clean Installation”) (if you have enough free space on your harddrive, or use a memory stick)

Create New Virtual Machine



Example of existing Virtual Machines

New Virtual Machine Wizard

Welcome to the New Virtual Machine Wizard

A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?

Install from:

Installer disc:

Select the OS .iso File for the OS you want to install

Installer disc image file (iso):

C:\Temp\Windows Server 2012 R2 (x64) - DVD (Englis) Browse...

Windows Server 2012 R2 detected.

This operating system will use Easy Install. [\(What's this?\)](#)

I will install the operating system later.

The virtual machine will be created with a blank hard disk.

Help

< Back

Next >

Cancel

New Virtual Machine Wizard

Name the Virtual Machine

What name would you like to use for this virtual machine?

Virtual machine name:

Windows Server 2012

Location:

C:\Virtual Machines\Windows Server 2012 Browse...

Select proper Name and Location

< Back

Next >

Cancel

New Virtual Machine Wizard

Easy Install Information

This is used to install Windows Server 2012.

Windows product key

| - - - -

Version of Windows to install

Windows Server 2012 R2 Datacenter

Personalize Windows

Full name: Hans-Petter

Password:

Confirm:

Select the version you want to install

Log on automatically (requires a password)

Help

< Back

Next >

Cancel

New Virtual Machine Wizard

Specify Disk Capacity

How large do you want this disk to be?

The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.

Maximum disk size (GB): 60.0

Recommended size for Windows Server 2012: 60 GB

Store virtual disk as a single file

Split virtual disk into multiple files

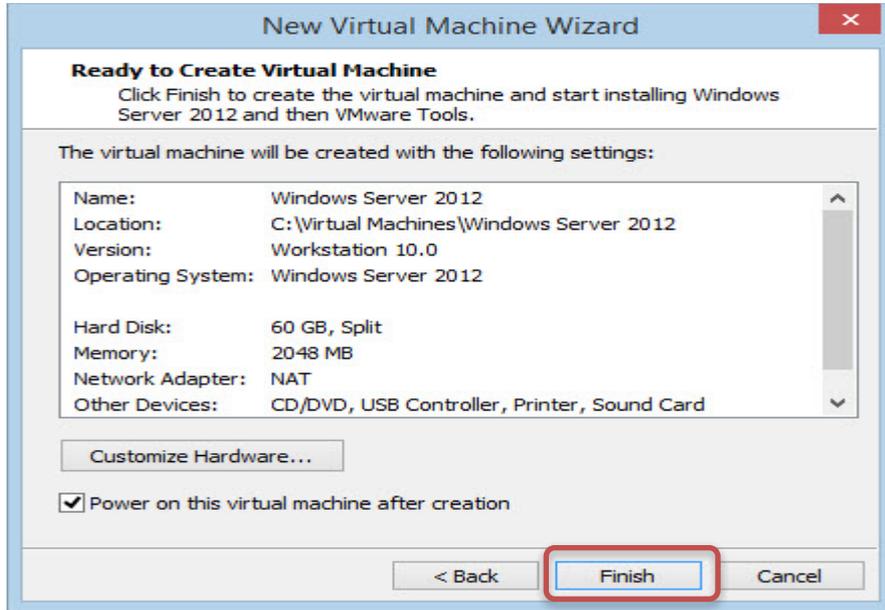
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.

Help

< Back

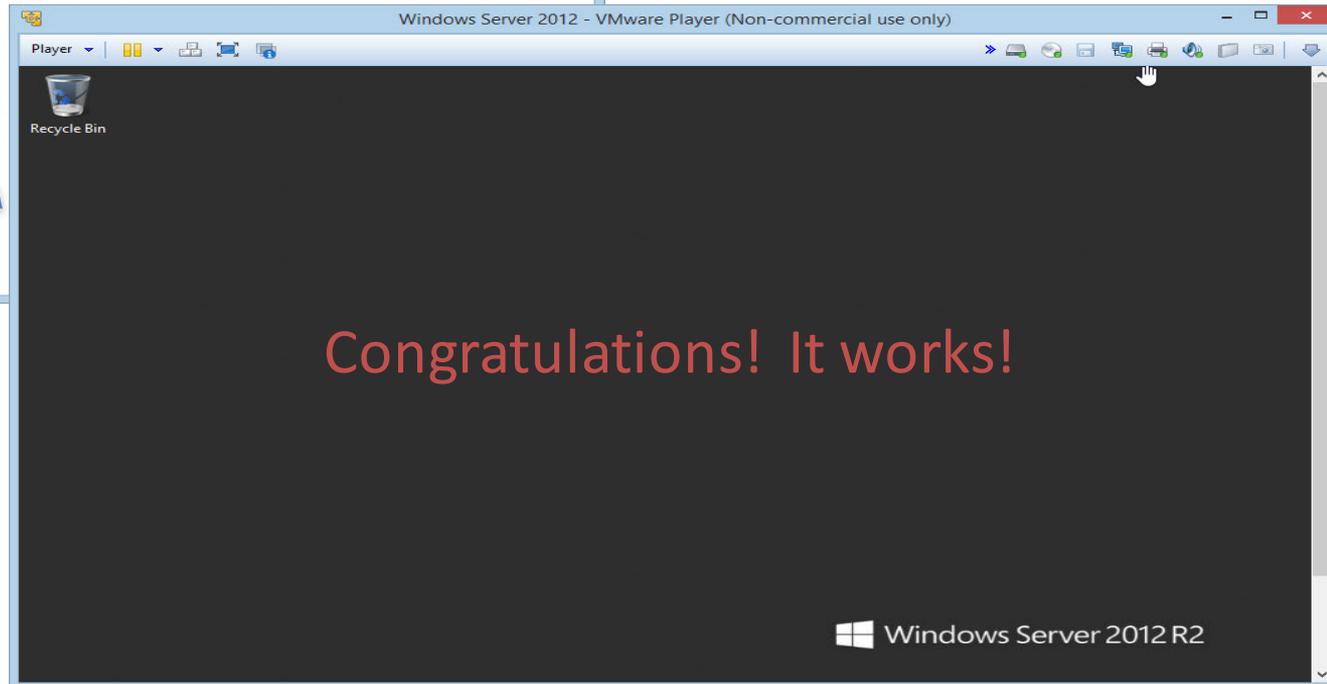
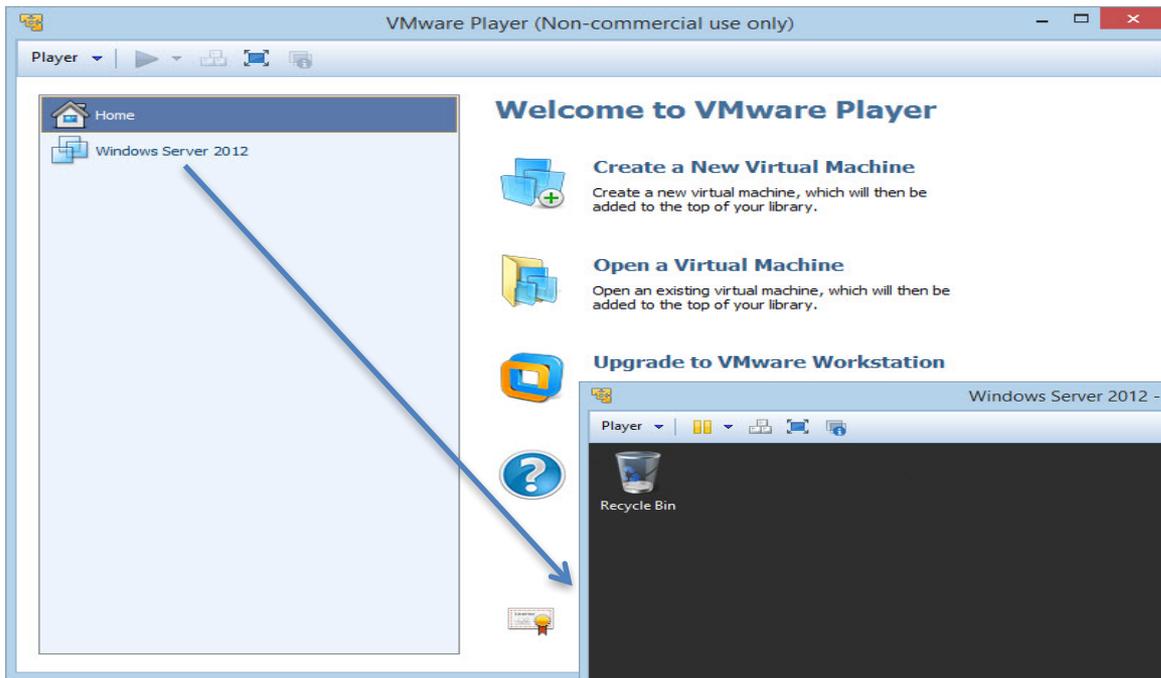
Next >

Cancel



Tools that the virtualization environment needs to work properly.

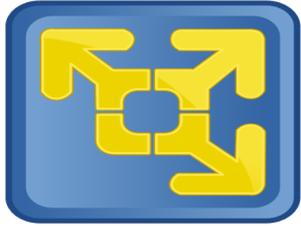
Click Finish



Note! It is recommended that you change the **Computer Name** before you start installing lots of Software on it.



You are finished with the Exercise

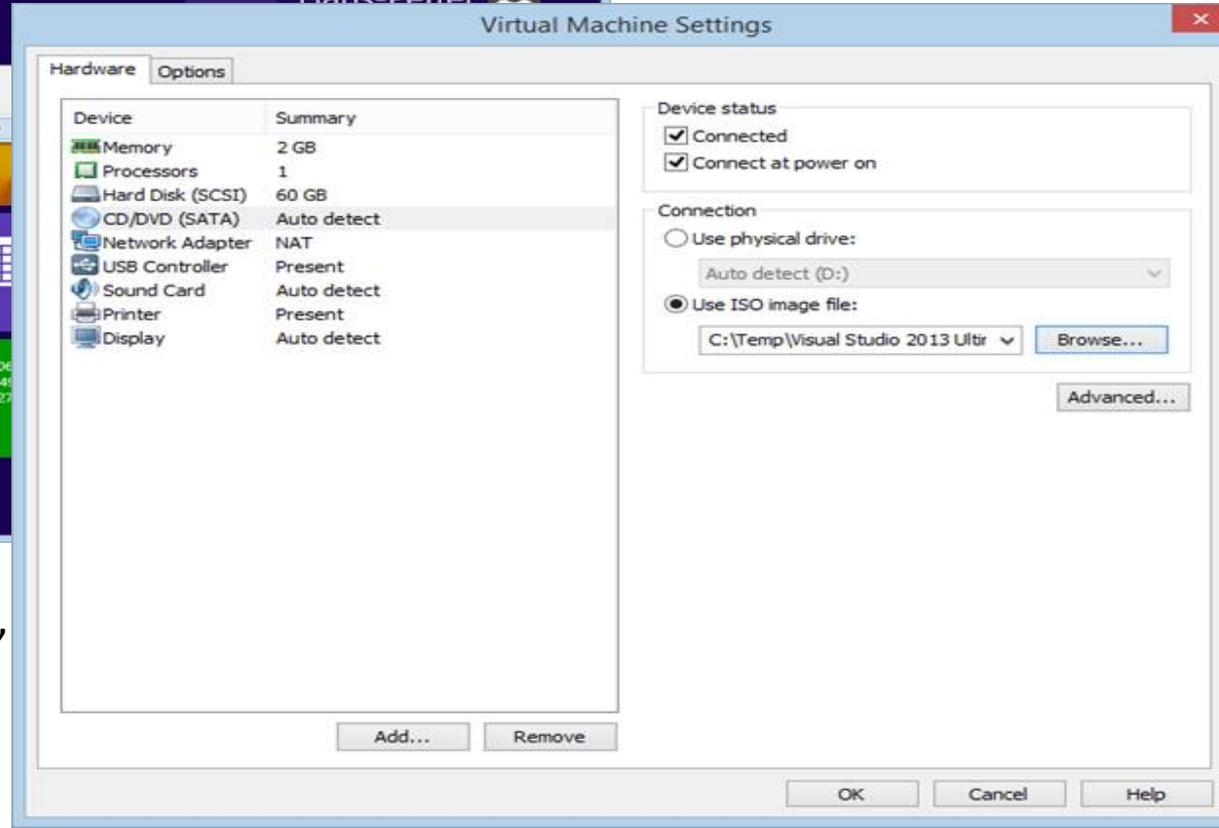


VMWare Player

Installation of Software
in a Virtual Machine

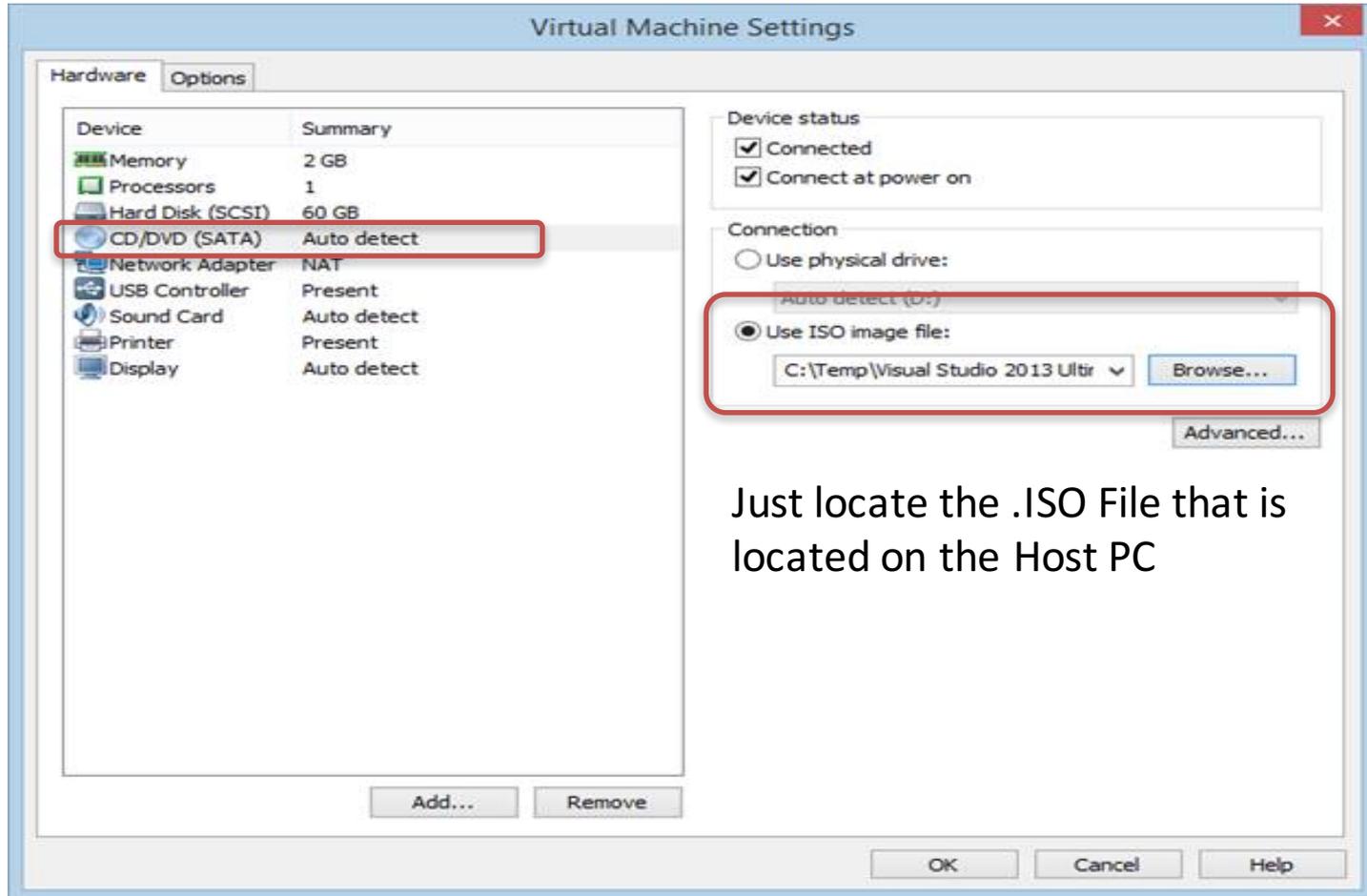
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Virtual Machine Settings



Note! You have access to Network, Printers, USB Ports, Sound Card, Camera, etc. on your Host PC

Installing Software using .iso Files



Just locate the .ISO File that is located on the Host PC

Installing/Copying from a **USB Memory Stick**

Click to Connect to a USB Memory stick that is connected to the Host PC



Copying Files into the VM

Just use “Ctrl + C” and “Ctrl + V” in order to copy files between your Host PC and the VM





You are finished with the Exercise



Database



Step by Step

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Database



- You should create one SQL Script that installs all the necessary stuff (Tables, Stored Procedures, Views, Scripts, etc...)
- Run the Script using the SQL Server Management Studio (or similar)

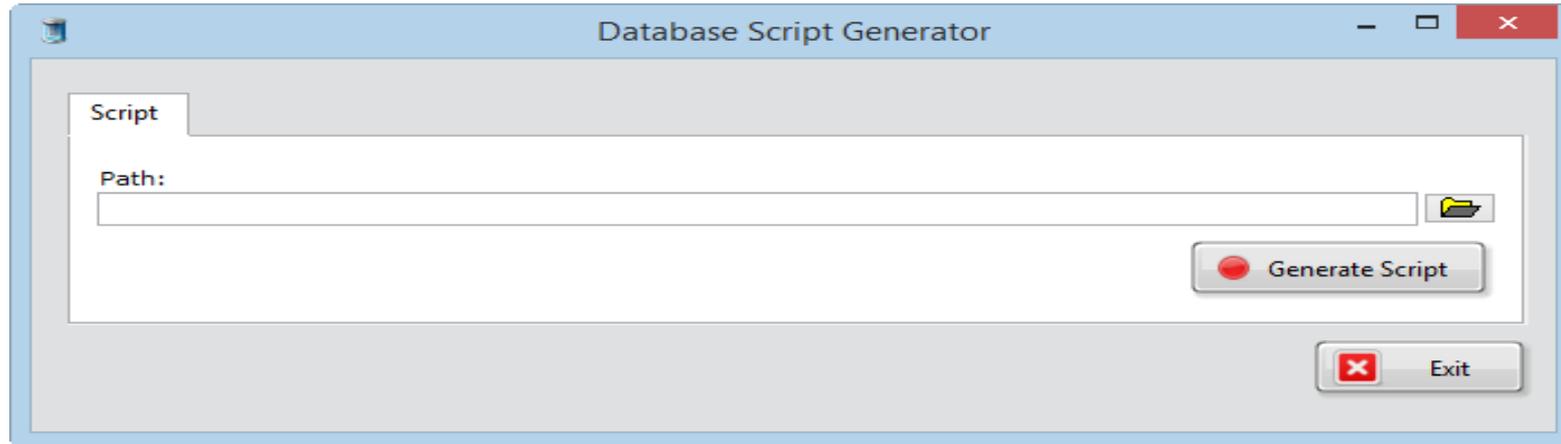
Database Script Generator



Folder structure:

- Functions
- Scripts
- Stored Procedures
- Tables
- Triggers
- Views

- This Tool generates one SQL Script that contains all SQL files in the Folder structure including subfolders (recursive).
- Useful when installing the Database – you need only to execute one single SQL file.



Download from http://home.hit.no/~hansha/?page=software_development

Microsoft SQL Server – Management Studio

1 Your SQL Server

2 Your Database

3

4 Write your Query here

5 The result from your Query

Your Tables

SchoolId	SchoolName	Description	Address	Phone	PostCode	PostAddress
1	TUC	The best school	Telemark	NULL	NULL	NULL
2	MIT	OK School	USA	NULL	NULL	NULL
3	NTNU	The second best school	Trondheim	NULL	NULL	NULL
4	University of Oslo	The third best school	Oslo	NULL	NULL	NULL

Query executed successfully. | PC88235\DEVELOPMENT (10.50 ... | sa (52) | SCHOOL | 00:00:00 | 4 rows

Ln 1 Col 21 Ch 21 INS



You are finished with the Exercise



Web Server

 Step by Step

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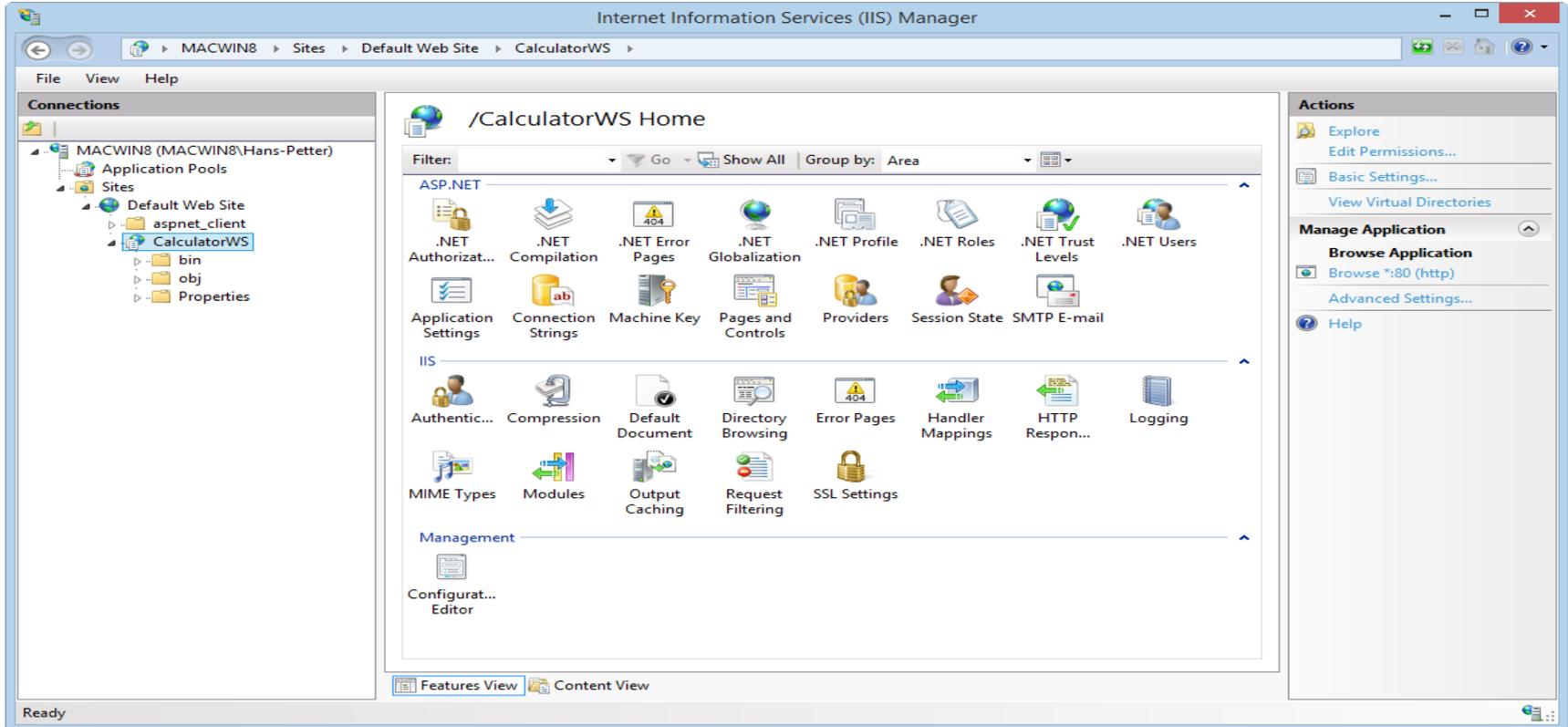
Web Server



- Configure/setup/install the Web Server
 - IIS (Internet Information Services), Apache, ...
- Install Web Services (if any)
- Install your Web App

Deploy/Publish Web Service to IIS

Copy Web Service Files (Project) to default IIS Directory: `C:\inetpub\wwwroot`



MACWIN8 > Sites > Default Web Site

File View Help

Connections

- MACWIN8 (MACWIN8\Hans-Petter)
- Application Pools
- Sites
 - Default Web Site
 - Context Menu
 - Explore
 - Edit Permissions...
 - Add Application...**
 - Add Virtual Directory...
 - Edit Bindings...
 - Manage Website
 - Refresh
 - Remove
 - Rename
 - Switch to Content View

Default Web Site Home

Filter: Go Show All Group by: Area

ASP.NET



Actions

- Explore
- Edit Permissions...
- Edit Site**
- Bindings...
- Basic Settings...
- View Applications
- View Virtual Directories
- Manage Website**
- Restart
- Start

Add Application

Site name: Default Web Site

Path: /

Alias:

SchoolWS

Application pool:

DefaultAppPool

Select...

Example: sales

Physical path:

C:\inetpub\wwwroot\SchoolWS

Pass-through authentication

Connect as...

Test Settings...

 Enable Preload

OK

Cancel



You are finished with the Exercise



Desktop App

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Install your Desktop App (if any)

- Manually Copy your App Files to the VM and make sure you can start it (Create a shortcut on the Desktop)
- It is recommended to create an .exe App

Note!

We will learn to create Setup Packages in the next Topic: “Deployment and Maintenance”



You are finished with the Exercise

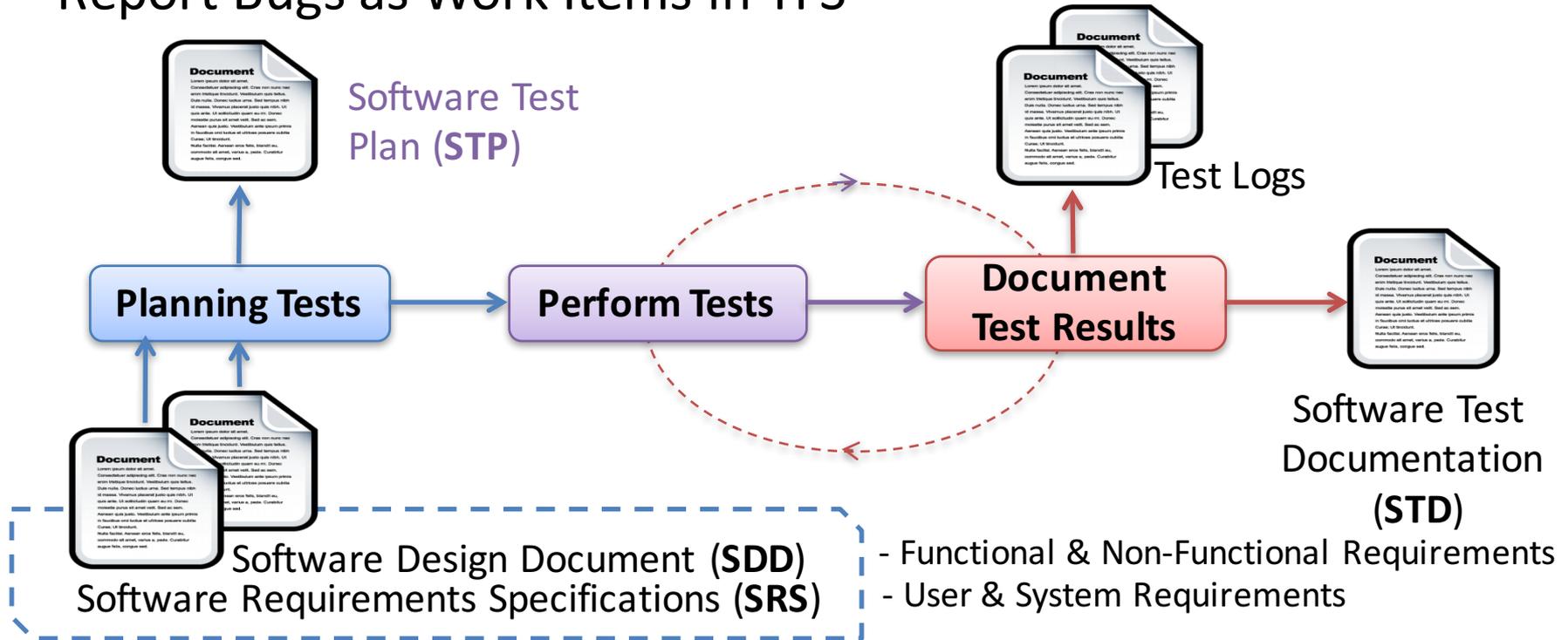


Start Testing

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Testing

- Test your software according to the **Requirements and Design Documents** and the **Software Test Plan**
- Report Bugs as Work Items in TFS



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