Workshop

Container

In The MS Universe

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time cockpit
Saves the day.

Your Host

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Questions for this Session

Options, options, options
When to use what?

Demos, demos, demos
See things in action

Overview, not a deep-dive

Overview

Available Options and Tools

Microsoft ❤ Containers

Docker client on Windows

In Windows shell

In Bash shell (Bash on Ubuntu on Windows)

Demo

Docker Client

Docker Client in Windows Shell

Ubuntu subsystem for Windows

- Not Docker, not Hyper-V
- Pico processes

Bash on Ubuntu on Windows

- Advantage: Completion

Microsoft ❤ Containers

Docker client on Windows

In Windows shell
In Bash shell (Bash on Ubuntu on Windows)

Linux containers on Windows

Docker for Windows

Windows containers on Windows

Windows Server containers
Hyper-V containers
Docker support on Windows Server 2016 and Windows 10

Microsoft ❤ Containers

Ready-made containers

For Linux and Windows
See Docker Hub (e.g. Azure CLI, .NET Core, PowerShell, IIS)

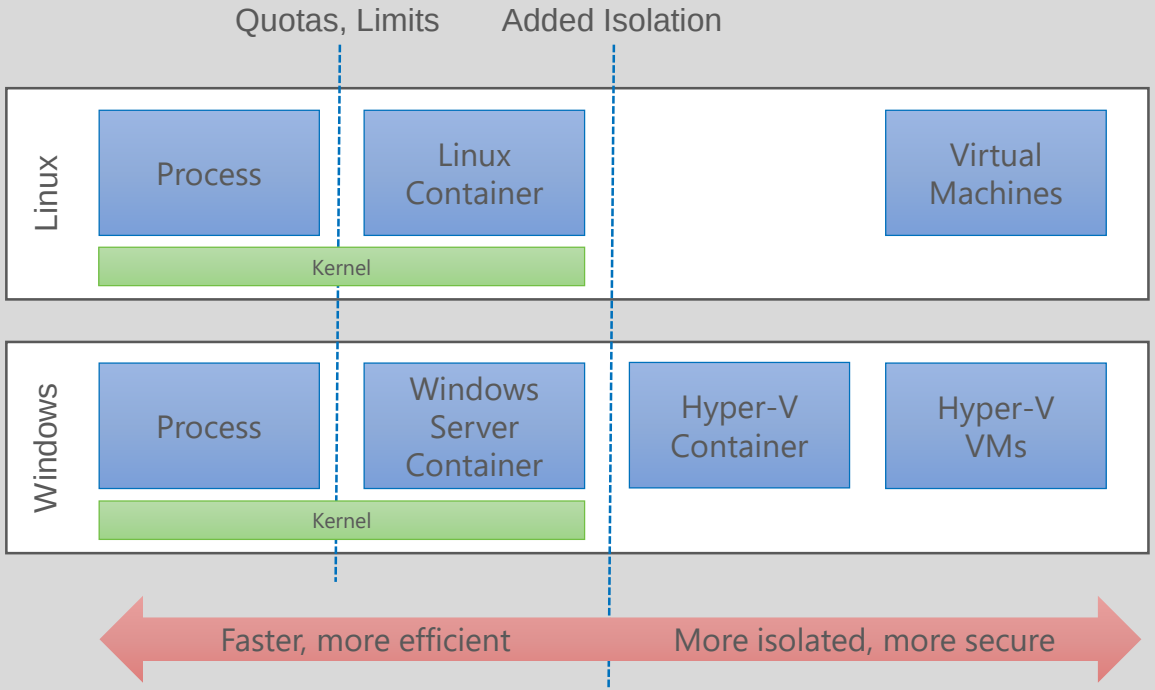
Containers on Azure

Templates (e.g. Docker on Unbuntu) and drivers from Microsoft (details later)
Docker Machine with Azure driver
Run clusters (DC/OS, Docker Swarm, Kubernetes) with Azure Container Service

Visual Studio Support

Visual Studio Tools for Docker
VSTS Docker Extension

Strengths and Limits



Windows Server vs. Hyper-V Containers

- Managed almost identically (Docker and PowerShell)
- Difference: Isolation level
- More details in MSDN

Source: Mark Fussel (Microsoft), Azure Service Fabric - Build always-on, hyper-scalable, microservice-based cloud applications

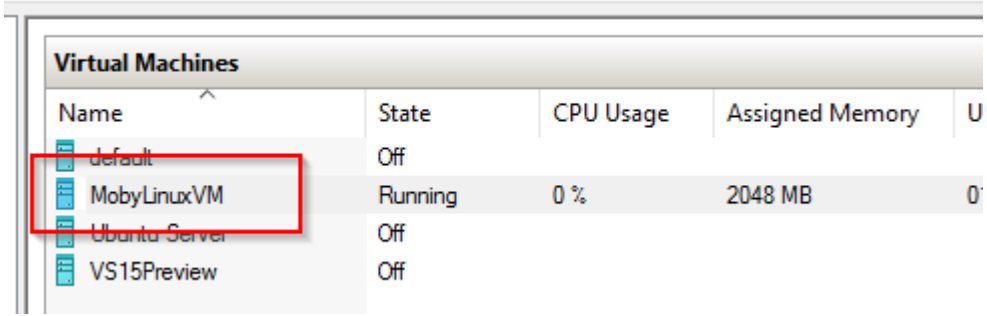
Linux on Windows

Running Linux containers on Windows

Linux on Windows

Use Docker for Windows

Uses Hyper-V to run Linux with Docker



Run Docker client on Windows or Linux

Demo

Docker for Windows

Docker for Windows UI

- Settings
- VM in Hyper-V

Container scenarios

- Interactive container
- Volume mapping
- Port mapping

Microsoft-provide image

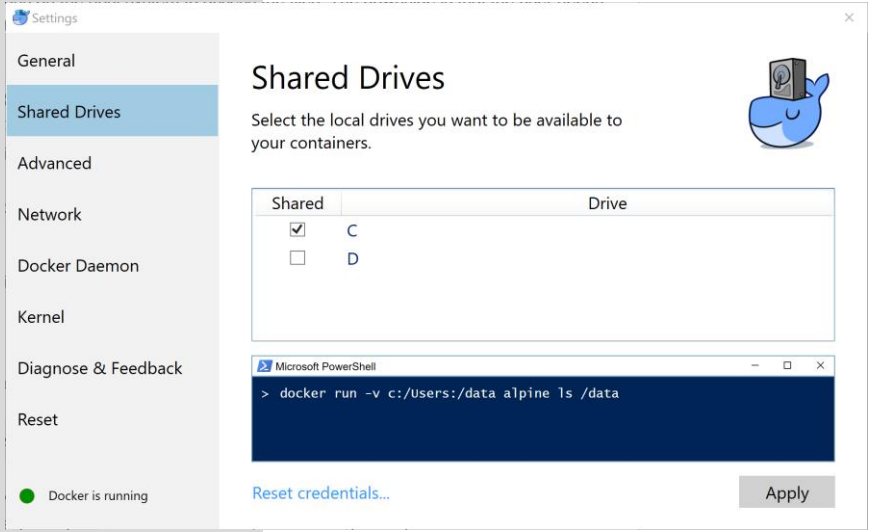
- .NET on Linux

```
# Run interactive ubuntu container
docker run -it --rm ubuntu /bin/bash

# Run postgres with volume mapping
docker run –d --name postgres -v c:\temp\data:/dbdata -e
POSTGRES_PASSWORD=P@ssw0rd! -e PGDATA=/dbdata postgres
# Show content of mapped volume on Windows

# Run mongo with port mapping
docker run -d --name mongo -p 27017:27017 mongo
# Use mongo client under Windows to access mongo in container

# Run .NET Core on Linux
docker run -it --rm microsoft/dotnet /bin/bash
mkdir /demo
cd /demo
dotnet new
ls –la
dotnet restore
dotnet run

# Option: Show .NET Core with VSCode and
#         Volume mapping
```

Demo

Prerequisites

- Docker for Windows installed and configured
- Don't forget to share drive in Docker for Windows settings!



Windows on Windows

Running Windows containers on Windows

Windows on Windows

OS Support

Windows Server 2016
Windows 10 (Hyper-V Container)

Windows Server Container

Hyper-V Container

Additional isolation layer
Runs inside of Windows Nano Server VM

```
docker run -it --rm --isolation=hyperv microsoft/nanoserver cmd
```

Demo

Windows Container

- Docker on Windows Server 2016
  - Full Server
  - Nano Server
- Connect Docker client
  - Docker client on Host
  - Remote Docker (Linux and Windows) client
- Container scenarios
  - Interactive container
  - Dockerfiles on Windows
  - Volume mapping

```
# Ping Docker host on Windows Server
docker -H tcp://1.2.3.4:2375 info
set DOCKER_HOST=tcp://1.2.3.4:2375
docker info
docker ps -a
docker images

# Run 'dir' inside a short-lived Nano Server container
docker run -it --rm microsoft/nanoserver cmd /C dir

# Run existing IIS image (source: Microsoft)
docker run -d -p 80:80 microsoft/iis cmd ping localhost -t

# Build Dockerfile, install IIS (details about IIS on Nano see
# https://technet.microsoft.com/en-us/library/mt627783.aspx)
docker build -t myiis .
docker images
docker run -it --rm myiis
  cd \install
  dism /online /apply-unattend:.\unattend.xml
  net start w3svc

# On Docker host (Enter-PSSession)
echo Hello > c:\temp\greeting.txt
c:\docker\docker.exe run --rm -v c:\temp:c:\somedir
microsoft/nanoserver cmd /C type \somedir\greeting.txt
```

Demo

Prerequisites

Windows Server with Container support

See also sample Dockerfile
https://github.com/rstropek/DockerVS2015Intro/blob/master/dockerDemos/07-win-container-nano-server/Dockerfile

Docker on Azure

Running containers in Azure

Docker on Azure

Docker support in *Azure Resource Manager* (ARM)

Extension for Docker on Linux
Ready-made ARM-templates (e.g. Docker on Ubuntu)

Azure driver for *Docker Machine*

Azure Container Services (ACS)

Storage

Docker Volume Driver for Azure File Storage

Demo

Containers in Azure

Docker Machine
- Azure Driver

ARM with Docker
- Using Quickstart Template

Volume driver for Files

```
docker-machine create --driver azure --azure-subscription-id
00000000-0000-0000-0000-000000000000 doc16-demo
# Show result in Azure Portal

# Create volume on Azure files
docker volume ls
docker volume create -d azurefile --name myvol -o share=doc16
docker volume ls
docker run -it --rm -v myvol:/data ubuntu /bin/bash
  cd /data
  echo Hello > greeting.txt
  # Show result in Azure Portal
```

Demo

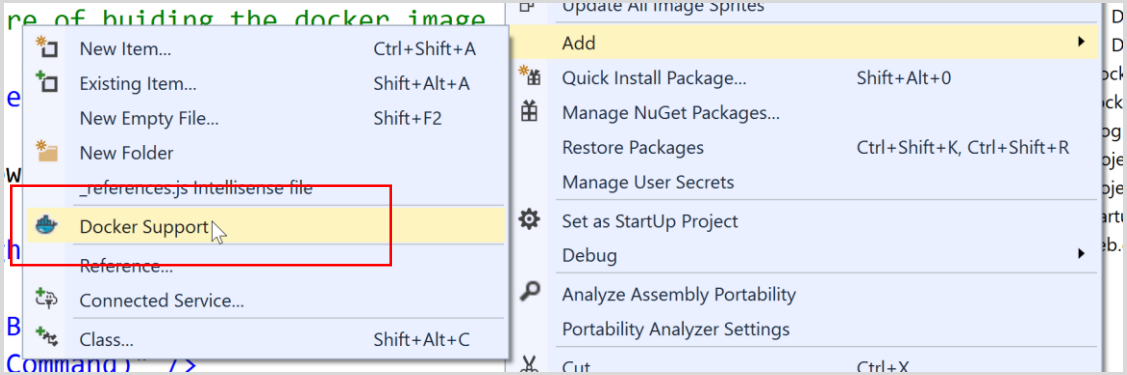
Prerequisites

- Docker Machine installed
- Docker Driver for Azure Files installed and configured

Developer Tools

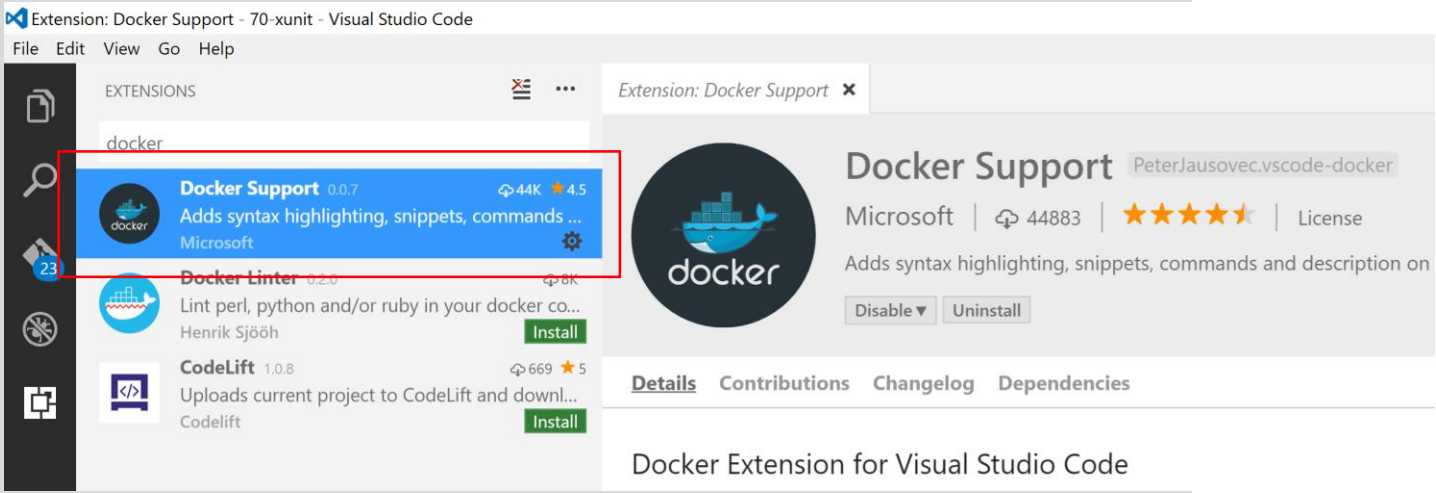
Visual Studio support

Visual Studio

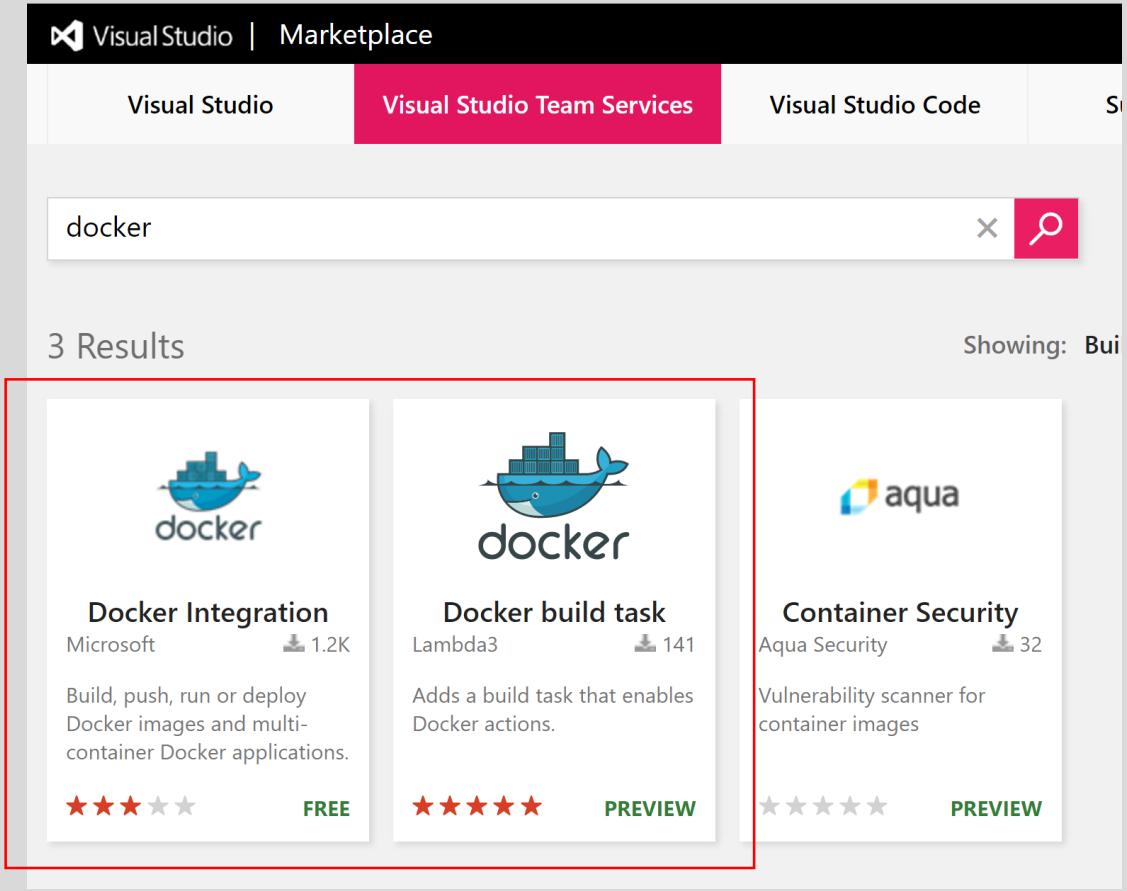


[Docker Tools for Visual Studio]

Docker support for Visual Studio Code



TFS/VSTS



[Docker extensions for TFS/VSTS]

Summary

Summary

Microsoft ♥ Linux and containers

Linux on Windows
Windows on Windows
All kinds of containers on Azure

For dev/test and prod

Containers on Windows 10 for devs
Azure Container Service for prod

Q&A

Thank you for attending!

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