

# From zero to hero with Docker

Running your ASP.NET Core 1 application in a  
Docker container

**DOTNEXT**

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# Who am I?



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# Overview

- What are containers
- What is Docker
- Creating and running Docker images
- Running an ASP.NET Core 1.0 App
  - In a Linux container
  - In a Windows container
- But we need more

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# What is a container?



*Glyn Lowe Photography*





Once upon a ship





Loading cargo the old way





A container ship these days



Loading is a bit faster



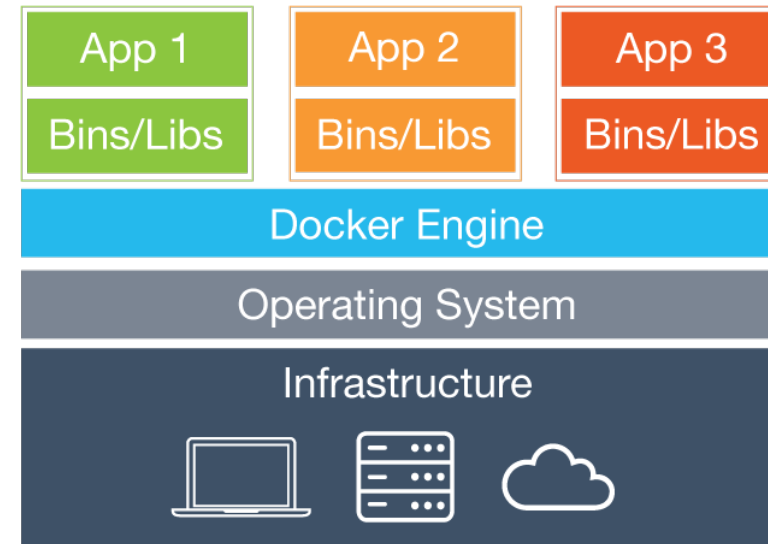
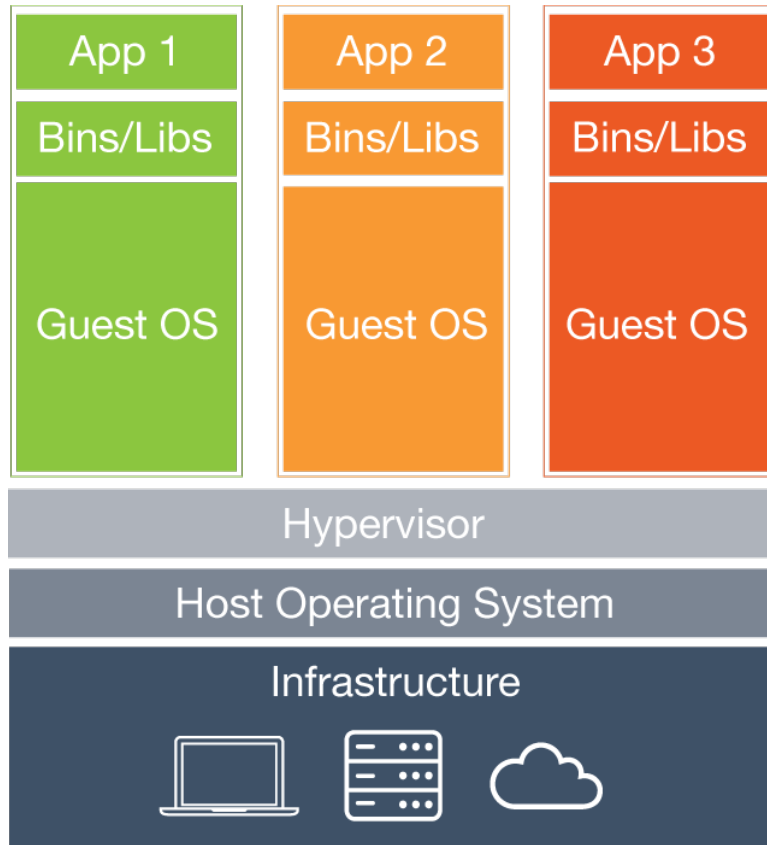


# Running virtual machines





# Virtual Machines vs Containers





# Namespaces & cgroups





**WATCH IT OR LOSE IT**

**THIEVES AT WORK**

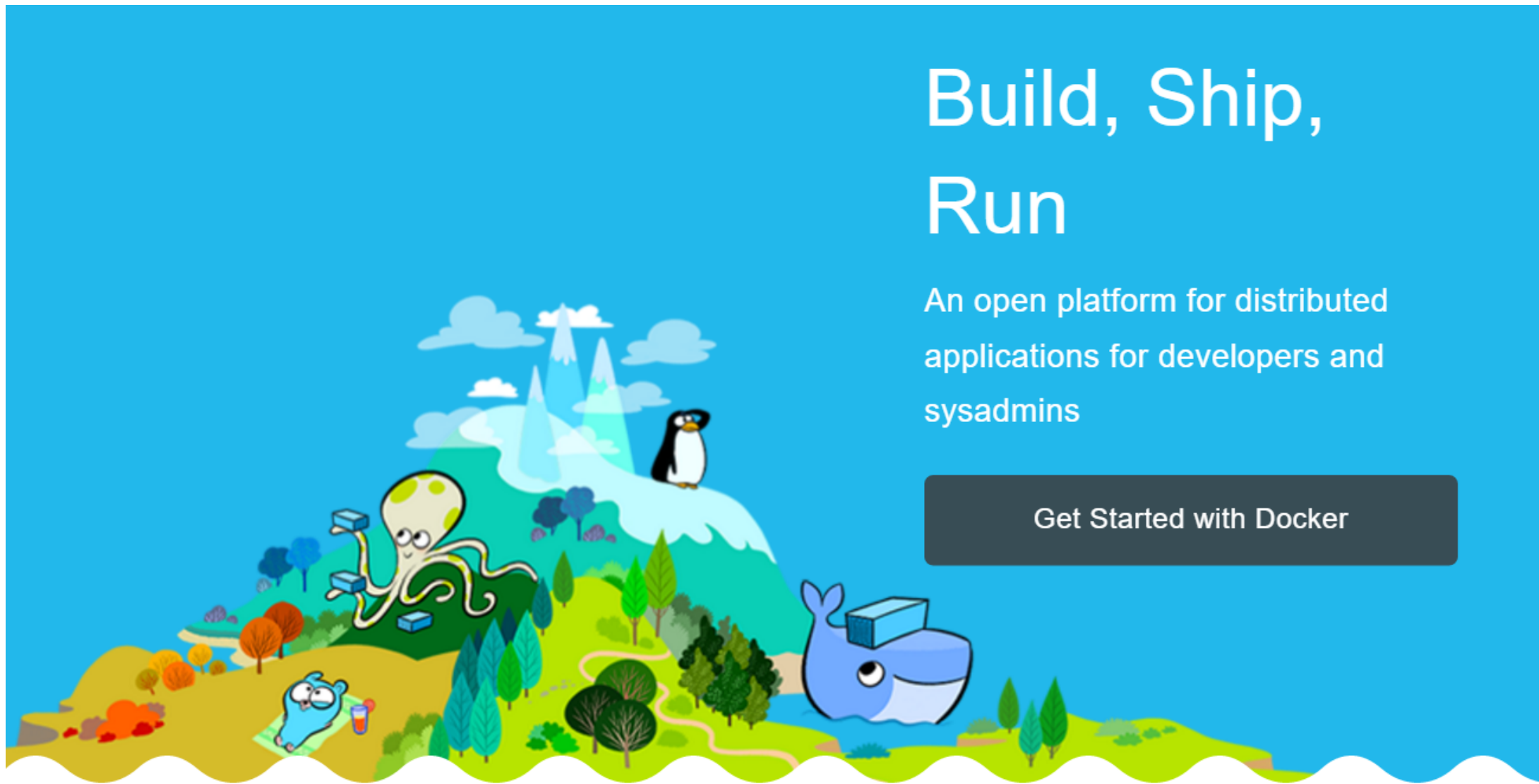


# What is Docker?

## Build, Ship, Run


An open platform for distributed  
applications for developers and  
sysadmins

Get Started with Docker





# Docker Hub

 [Explore](#) [Help](#)

[Log In](#)

## Build, Ship, & Run Any App, Anywhere

Dev-test pipeline automation, 100,000+ free apps, public and private registries

### New to Docker?

Create your free Docker ID to get started.



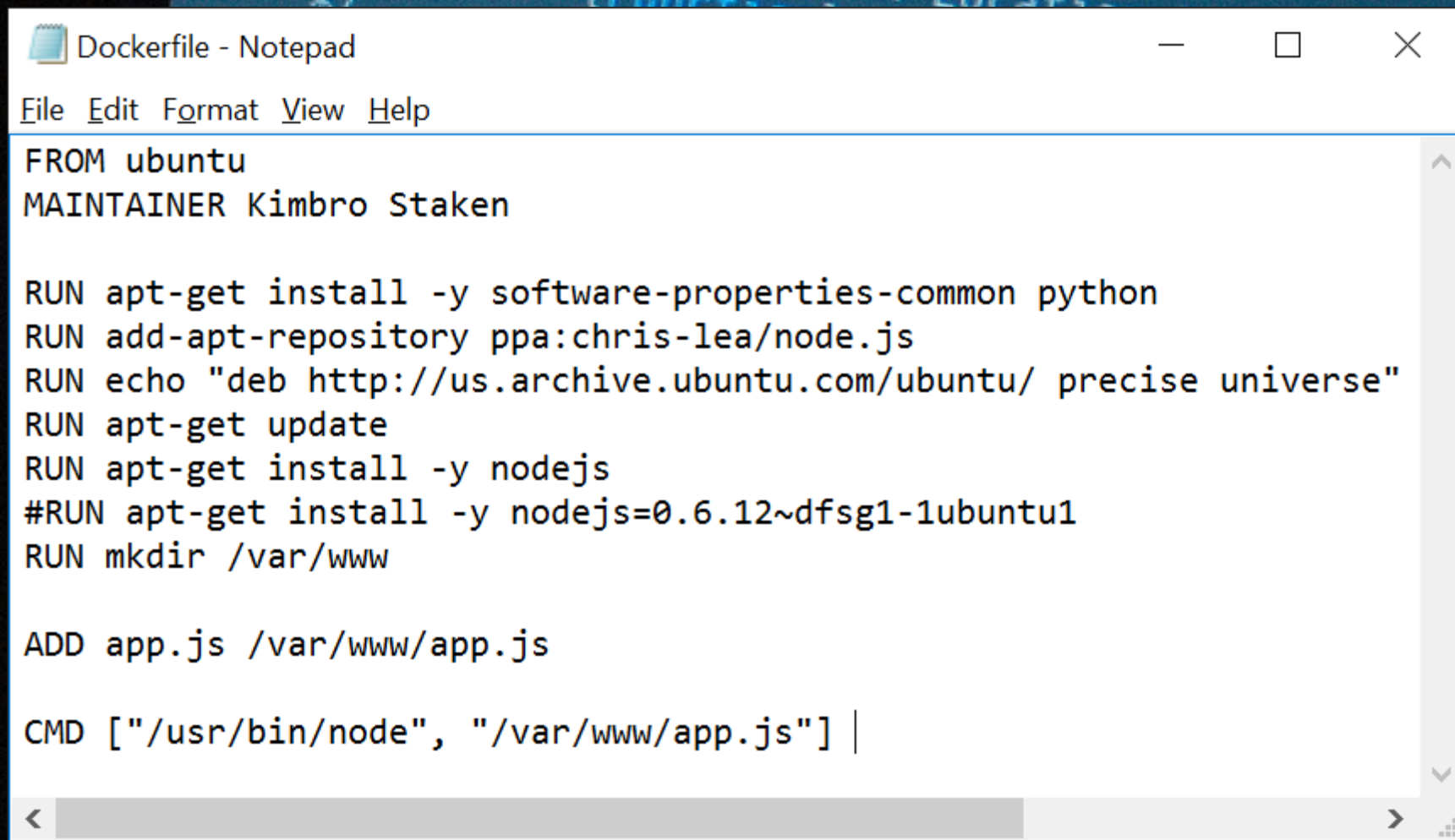




[Sign Up](#)



# Building containers



```
Dockerfile - Notepad
File Edit Format View Help
FROM ubuntu
MAINTAINER Kimbro Staken

RUN apt-get install -y software-properties-common python
RUN add-apt-repository ppa:chris-lea/node.js
RUN echo "deb http://us.archive.ubuntu.com/ubuntu/ precise universe"
RUN apt-get update
RUN apt-get install -y nodejs
#RUN apt-get install -y nodejs=0.6.12~dfsg1-1ubuntu1
RUN mkdir /var/www

ADD app.js /var/www/app.js

CMD ["/usr/bin/node", "/var/www/app.js"] |
```



# Container anti pattern

The screenshot shows a web browser window displaying a Docker Hub repository page. The browser's address bar shows the URL `https://hub.docker.com/r/oblank/docker-centos-nginx-php-mongo-redis-memcached`. The page header includes navigation links for Dashboard, Explore, and Organizations, along with a search bar containing 'mauricedb' and a user profile for 'mauricedb'. The repository details show it is 'PUBLIC | AUTOMATED BUILD' and was 'Last pushed: 6 hours ago'. The 'Repo Info' tab is selected, showing a 'Short Description' box with the text 'Docker-Centos-Nginx-PHP-Mongo-Redis-Memcached AND Node NPM'. The background of the slide features faint, stylized code snippets such as 'set route by hash.', '@param {String}', '+ rule.route', and 'can be chained.'

https://hub.docker.com/r/oblank/docker-centos-nginx-php-mongo-redis-memcached

PUBLIC | AUTOMATED BUILD

oblank/docker-centos-nginx-php-mongo-redis-memcached ☆

Last pushed: 6 hours ago

Repo Info Tags Dockerfile Build Details

Short Description

Docker-Centos-Nginx-PHP-Mongo-Redis-Memcached AND Node NPM

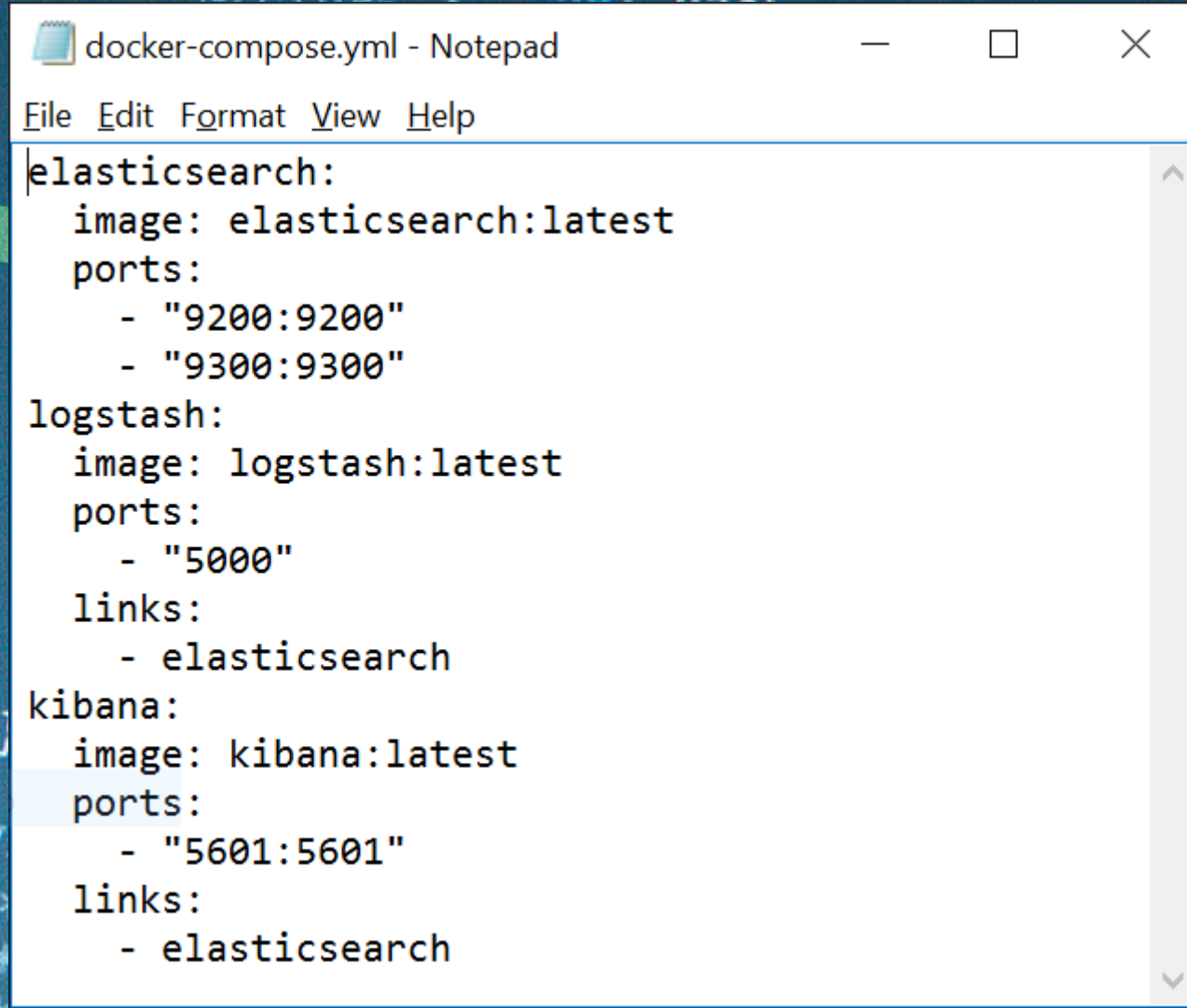


# Orchestration





# Docker Compose



```
docker-compose.yml - Notepad
File Edit Format View Help
elasticsearch:
  image: elasticsearch:latest
  ports:
    - "9200:9200"
    - "9300:9300"
logstash:
  image: logstash:latest
  ports:
    - "5000"
  links:
    - elasticsearch
kibana:
  image: kibana:latest
  ports:
    - "5601:5601"
  links:
    - elasticsearch
```



# ASP.NET Core 1.0 App on Linux

Dockerfile

```
FROM microsoft/dotnet:1.0.0-preview1

# Usage:
#   docker build -t dotnext .
#   docker run -p 5000:5000 -d dotnext

MAINTAINER Maurice de Beijer <maurice.de.beijer@gmail.com>

RUN mkdir -p /app
WORKDIR /app

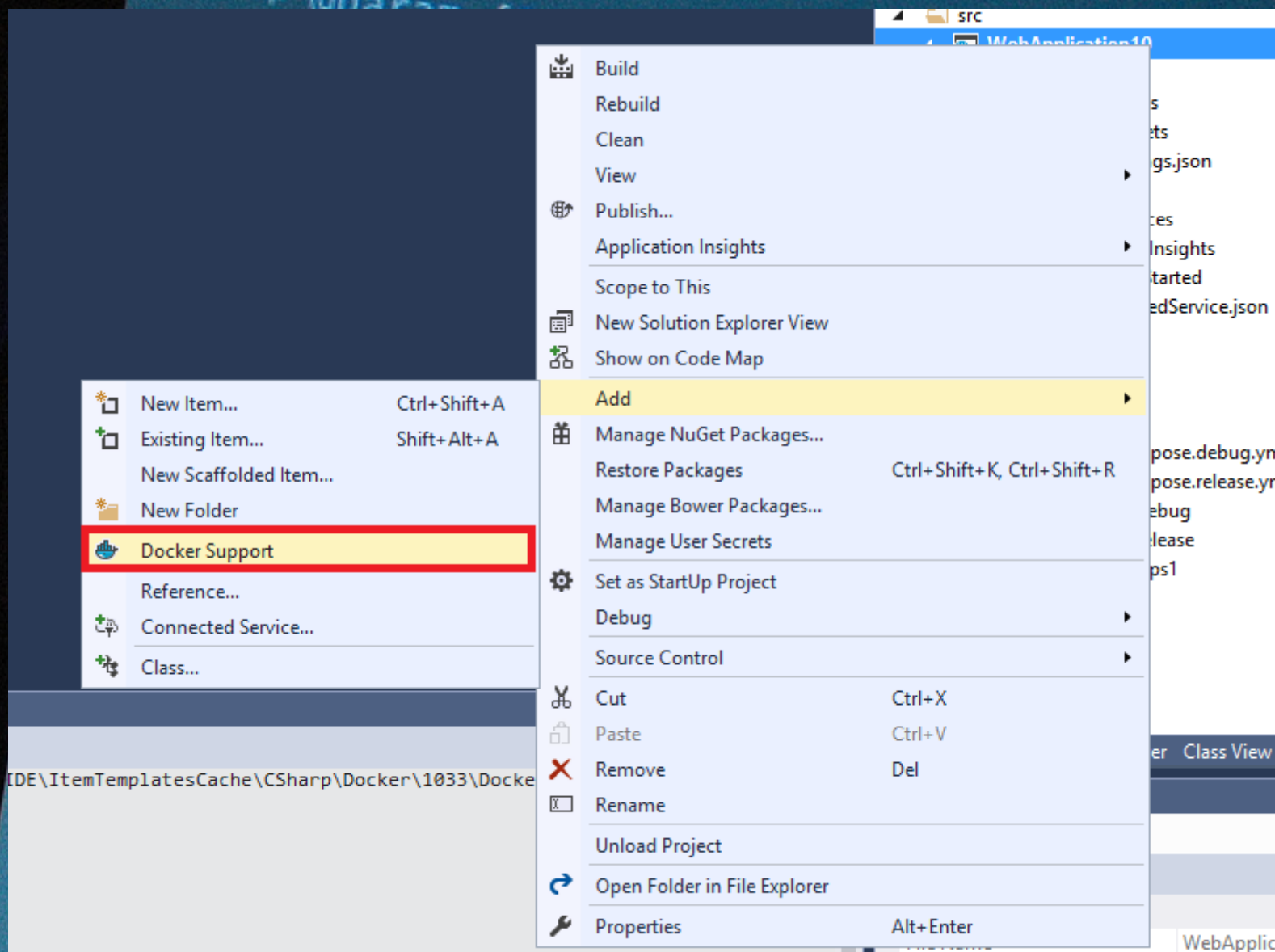
COPY . /app
RUN dotnet restore

ENV ASPNETCORE_SERVER.URLS http://*:5000
EXPOSE 5000

CMD ["dotnet", "run"]
```

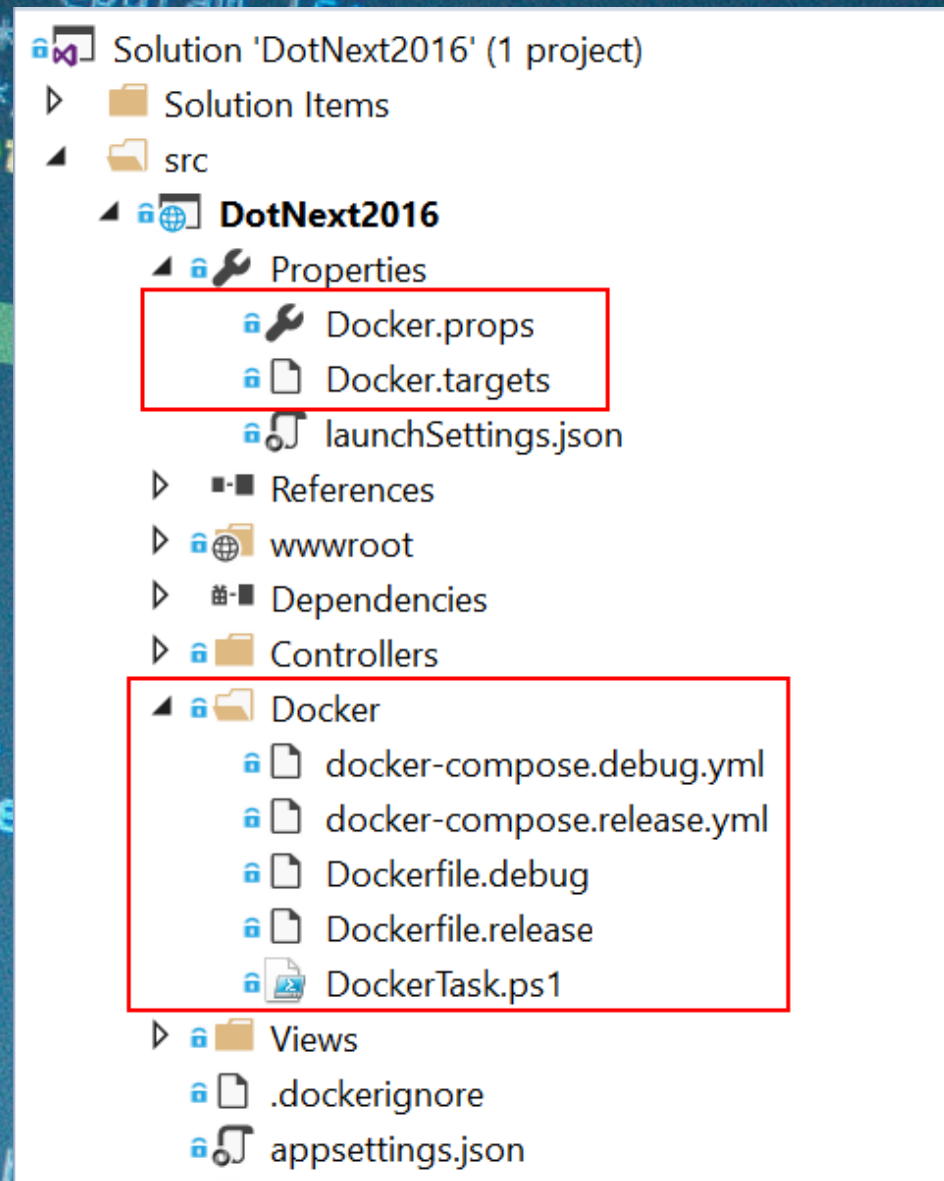


# Docker Tools for Visual Studio 2015





# Docker Tools for Visual Studio 2015





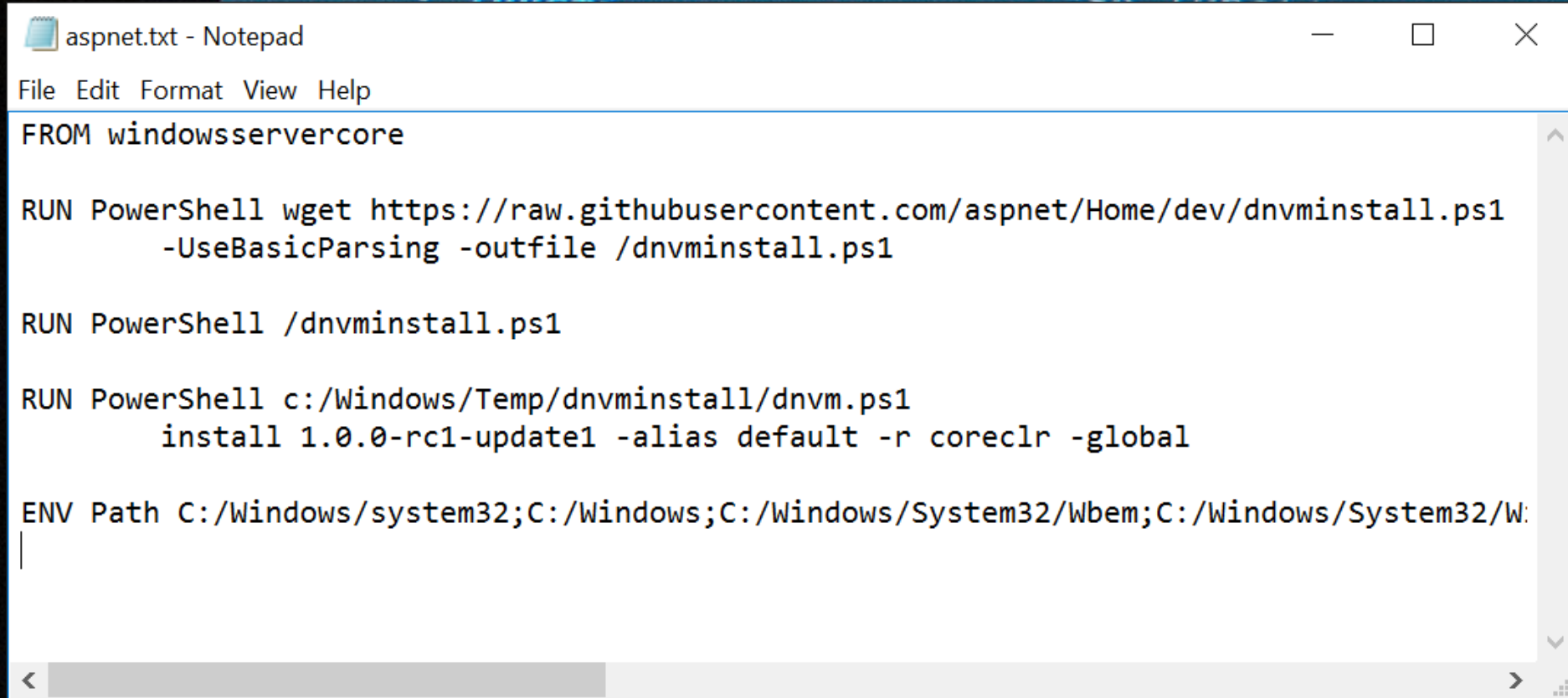
# Docker on Windows





| Docker command                                  | PowerShell Cmdlet  |
|---|--|
| <code>docker ps -a</code>                       | <code>Get-Container</code>                                   |
| <code>docker images</code>                      | <code>Get-ContainerImage</code>                              |
| <code>docker rm</code>                          | <code>Remove-Container</code>                                |
| <code>docker rmi</code>                         | <code>Remove-ContainerImage</code>                           |
| <code>docker create</code>                      | <code>New-Container</code>                                   |
| <code>docker commit &lt;container ID&gt;</code> | <code>New-ContainerImage -Container &lt;container&gt;</code> |
| <code>docker load &lt;tarball&gt;</code>        | <code>Import-ContainerImage &lt;AppX package&gt;</code>      |
| <code>docker save</code>                        | <code>Export-ContainerImage</code>                           |
| <code>docker start</code>                       | <code>Start-Container</code>                                 |
| <code>docker stop</code>                        | <code>Stop-Container</code>                                  |





```
aspnet.txt - Notepad
File Edit Format View Help
FROM windowsservercore

RUN PowerShell wget https://raw.githubusercontent.com/aspnet/Home/dev/dnvminstall.ps1
    -UseBasicParsing -outfile /dnvminstall.ps1

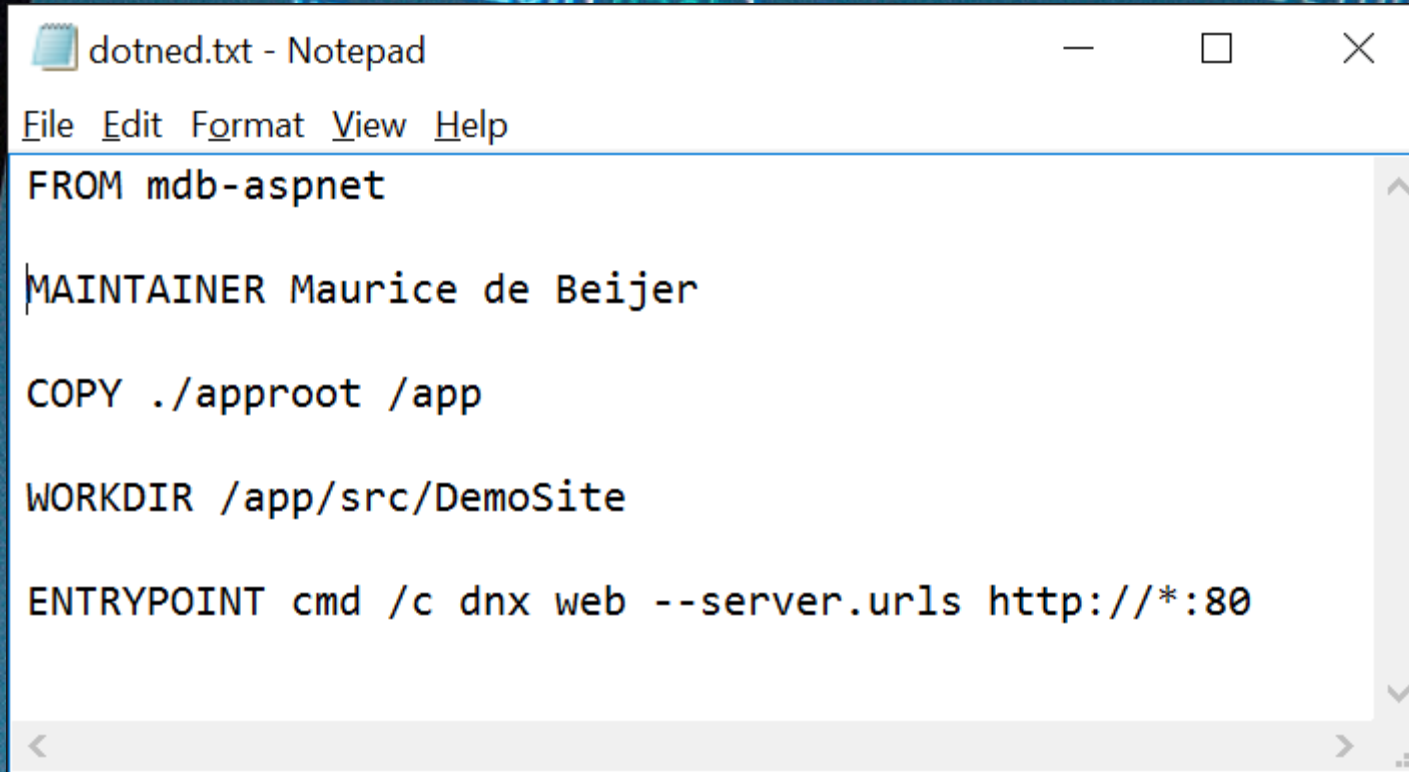
RUN PowerShell /dnvminstall.ps1

RUN PowerShell c:/Windows/Temp/dnvminstall/dnvm.ps1
    install 1.0.0-rc1-update1 -alias default -r coreclr -global

ENV Path C:/Windows/system32;C:/Windows;C:/Windows/System32/Wbem;C:/Windows/System32/W
```



# ASP.NET Core 1.0 App on Windows



```
dotned.txt - Notepad
File Edit Format View Help
FROM mdb-aspnet

MAINTAINER Maurice de Beijer

COPY ./approot /app

WORKDIR /app/src/DemoSite

ENTRYPOINT cmd /c dnx web --server.urls http://*:80
```



Containers can be great...









...with the right tools!





635 PL NE







## CONTAINER ENGINE

Run Docker containers on Google Cloud Platform, powered by Kubernetes.

[TRY IT FREE](#)

## Automated Container Management

Google Container Engine is a **powerful cluster manager and orchestration system** for running your Docker containers. Container Engine **schedules your containers** into the cluster and manages them automatically based on requirements you define (such as CPU and memory). It's **built on the open source Kubernetes** system, giving you the flexibility to take advantage of **on-premises, hybrid, or public cloud infrastructure**.





PRODUCTS & SERVICES

- Amazon EC2 Container Service >
- Product Details >
- Getting Started >
- Pricing >
- FAQs >
- Container Day >

RELATED LINKS

- Partners
- Documentation
- Blog
- Discussion Forum
- Amazon EC2 Container Registry

## Amazon EC2 Container Service

Amazon EC2 Container Service (ECS) is a highly scalable, high performance container management service that supports [Docker](#) containers and allows you to easily run applications on a managed cluster of [Amazon EC2](#) instances. Amazon ECS eliminates the need for you to install, operate, and scale your own cluster management infrastructure. With simple API calls, you can launch and stop Docker-enabled applications, query the complete state of your cluster, and access many familiar features like security groups, [Elastic Load Balancing](#), [EBS](#) volumes, and [IAM](#) roles. You can use Amazon ECS to schedule the placement of containers across your cluster based on your resource needs and availability requirements. You can also integrate your own scheduler or third-party schedulers to meet business or application specific requirements.

There is no additional charge for Amazon EC2 Container Service. You pay for AWS resources (e.g. EC2 instances or EBS volumes) you create to store and run your application.

### Amazon EC2 Container Service

Get Started

Receive twelve months of access to the [AWS Free Usage Tier](#) and enjoy AWS Basic Support features including, 24x7x365 customer service, support forums, and more.



# Announcing Azure Container Service

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Standard Docker tooling and API support

Streamlined provisioning of Apache Mesos Clusters

Integrated app management and scaling

Linux and Windows Server containers

Azure and Azure Stack







[Getting Started](#)

[Documentation](#)

[Downloads](#)

[Community](#)

## Program against your datacenter like it's a single pool of resources

Apache Mesos abstracts CPU, memory, storage, and other compute resources away from machines (physical or virtual), enabling fault-tolerant and elastic distributed systems to easily be built and run effectively.

[Download Mesos 0.27.0](#) or learn how to [get started](#)

### What is Mesos?

A distributed systems kernel

Mesos is built using the same principles as the Linux kernel, only at a different level of abstraction. The Mesos kernel runs on every machine and provides applications (e.g., Hadoop, Spark, Kafka, Elastic Search) with API's for resource management and scheduling across entire datacenter and cloud environments.





# kubernetes

Manage a cluster of Linux containers as a  
single system to accelerate Dev and  
simplify Ops.

[View on GitHub](#)

[Try Kubernetes](#)



# Announcing Rancher 1.0

A Complete Platform for Running Containers



[Learn More](#)

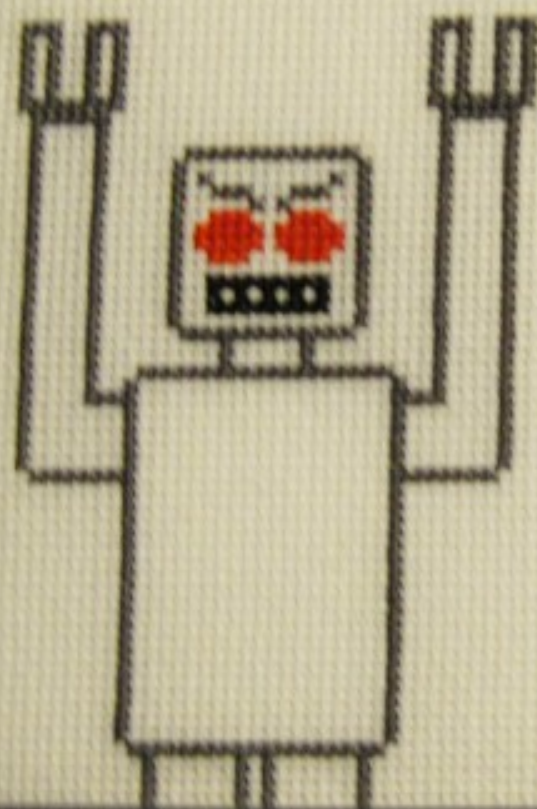


[Download Rancher](#)

"By migrating from a physical box to a Rancher controlled Docker infrastructure, we have been able to lower the amount of time our teams spend working with builds, and it allows us to quickly scale up or down seamlessly. Rancher has becoming a powerful tool in our DevOps arsenal and I would highly recommend it to anyone."







IT'S GONNA  
BE THE  
FUTURE  
SOON



THANK YOU FOR  
VISITING

PLEASE COME AGAIN

Maurice de Beijer - @mauricedb