

# Introduction to Docker, Kubernetes and Microservices

A 2-day hands-on workshop on Docker, Kubernetes and micro Services for Developers. Examples are provided based on NodeJS, MongoDB and Kubernetes platforms. The course includes lots of hands on labs.

Students participating in the workshop will be introduced and experienced the best practices of using Docker and microservices as part of the development effort. Full hands on labs on Docker and Docker Compose are included. Many samples and examples are demoed. During the course the students will be presented with an introduction to Microservices design and Kubernetes

## AUDIENCE

Developers

## KNOWLEDGE REQUIREMENTS

Linux administration and basic commands (Ubuntu)  
Node.JS/Mongo DB (Optional)

## LENGTH

2 Days

## BONUS

Hands-on lab sessions

## SYLLABUS

Course Introduction  
Introduction to Docker  
Docker Containers and Images  
Build Images  
Stateful Containers  
Multi Container Applications – Docker Compose  
Monitoring Containers  
Microservices Revisited  
Docker and Microservices Summary  
Kubernetes Intro  
Summary

## HARDWARE AND SOFTWARE REQUIREMENTS

### Computer Requirements

- RAM: minimum 8 GB of RAM required for exercises and platform to operate, 16 GB and up recommended.
- Disk Space: At least 40 GB of free disk space
- Internet connection
- All machines connected to same Network

### Supported Operating Systems

- Linux Ubuntu VM is provided.
- Machine should be able to run VMware Player and host the Ubuntu VM

### Additional Software Requirements

- PDF Reader
- Zip software

### Class HW required (If delivered on customer site)

- Projector 1024\*768 minimum resolution (HD preferred)
- White Board
- Erasable Markers
- Desktops or Laptops (see HW Requirements)
- 12-24 ports Switch
- Internet connectivity
- Electricity outlets for all computers/monitors and other equipment.
- At least 3 electricity outlets next to instructor location.

DAY 1 - AGENDA	
<b>Day 1: Lesson 1: Course Introduction</b>	<b>Duration: 1 hour Including Lab</b>
<ul style="list-style-type: none"> <li>• Course Introduction</li> <li>• Courseware walkthrough</li> <li>• Course environment</li> <li>• Documentation</li> <li>• Lab</li> </ul>	
<b>Day 1: Lesson 2: Microservices Introduction</b>	<b>Duration: 1 hour</b>
<ul style="list-style-type: none"> <li>• Monolithic Design</li> <li>• Basic microservices design</li> </ul>	
<b>Day 1: Lesson 3: Docker Introduction</b>	<b>Duration: 1 hour</b>
<ul style="list-style-type: none"> <li>• Docker Introduction</li> <li>• Docker Installation</li> <li>• Docker CLI Introduction</li> <li>• Lab</li> </ul>	
<b>Day 1: Lesson 4: Containers and Images</b>	<b>Duration: 2 hours Including Lab</b>
<ul style="list-style-type: none"> <li>• Manage Images and Containers basics</li> <li>• Expose container ports</li> <li>• Container logs</li> <li>• Lab</li> </ul>	
<b>Day 1: Lesson 5: Build Images</b>	<b>Duration: 2 hours Including Lab</b>
<ul style="list-style-type: none"> <li>• Build and run your first Image</li> <li>• Build and run your first Node.JS Image</li> <li>• Image Tags</li> <li>• Additional Dockerfile Commands</li> <li>• Lab</li> </ul>	
<b>Day 1: Lesson 6: Multi Container Applications</b>	<b>Duration: 2 hours Including Lab</b>
<ul style="list-style-type: none"> <li>• Multi Container Applications</li> <li>• docker-compose</li> <li>• Multi Container Application Example</li> <li>• Running the Example</li> <li>• Container Dependency</li> <li>• Additional Options (if time permits)</li> <li>• Lab</li> </ul>	

DAY 2 - AGENDA	
<b>Day 2: Lesson 7: Stateful Docker Container</b>	<b>Duration: 1 hour Including Lab</b>
<ul style="list-style-type: none"> <li>• Stateful Containers</li> <li>• Lab</li> </ul>	
<b>Day 2: Lesson 8: Monitoring Containers</b>	<b>Duration: 1 hour Including Lab</b>
<ul style="list-style-type: none"> <li>• Monitored Application</li> <li>• Container logs</li> <li>• Docker container stats CLI</li> <li>• Docker remote API</li> <li>• Docker system events CLI</li> <li>• Additional Monitoring Tools</li> <li>• Lab</li> </ul>	
<b>Day 2: Lesson 9: Microservices Revisited</b>	<b>Duration: 2 Hours</b>
<ul style="list-style-type: none"> <li>• Characteristics of Microservices</li> <li>• Monolithic vs Microservices Architectures</li> <li>• Under the Hood</li> <li>• Customers Using Microservices</li> <li>• Design Practice</li> </ul>	
<b>Day 2: Lesson 10: Microservices and Docker Summary</b>	<b>Duration: 1.5 hours</b>
<ul style="list-style-type: none"> <li>• Microservices and Docker Summary</li> </ul>	
<b>Day 2: Lesson 11: Kubernetes Intro</b>	<b>Duration: 1.5 hours</b>
<ul style="list-style-type: none"> <li>• The need for containers and containers orchestrators</li> <li>• What is Kubernetes?</li> <li>• Kubernetes Core Components</li> </ul>	
<b>Day 2: Lesson 12: Summary</b>	<b>Duration: 0.5 hours</b>
<ul style="list-style-type: none"> <li>• Defining the real Micro Services</li> <li>• Understanding the Mentored Development process</li> <li>• Summary</li> </ul>	