

COURSEWARE

DEVOPS

FOUNDATION COURSEWARE -
ENGLISH

Oleg Skrynnik

DevOps Foundation Courseware

Colophon

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Publisher about the Courseware

The Courseware was created by experts from the industry who served as the author(s) for this publication. The input for the material is based on existing publications and the experience and expertise of the author(s). The material has been revised by trainers who also have experience working with the material. Close attention was also paid to the key learning points to ensure what needs to be mastered.

The objective of the courseware is to provide maximum support to the trainer and to the student, during his or her training. The material has a modular structure and according to the author(s) has the highest success rate should the student opt for examination. The Courseware is also accredited for this reason, wherever applicable.

In order to satisfy the requirements for accreditation the material must meet certain quality standards. The structure, the use of certain terms, diagrams and references are all part of this accreditation. Additionally, the material must be made available to each student in order to obtain full accreditation. To optimally support the trainer and the participant of the training assignments, practice exams and results are provided with the material.

Direct reference to advised literature is also regularly covered in the sheets so that students can find additional information concerning a particular topic. The decision to leave out notes pages from the Courseware was to encourage students to take notes throughout the material.

Although the courseware is complete, the possibility that the trainer deviates from the structure of the sheets or chooses to not refer to all the sheets or commands does exist. The student always has the possibility to cover these topics and go through them on their own time. It is recommended to follow the structure of the courseware and publications for maximum exam preparation.

The courseware and the recommended literature are the perfect combination to learn and understand the theory.

-- Van Haren Publishing

Other publications by Van Haren Publishing

Van Haren Publishing (VHP) specializes in titles on Best Practices, methods and standards within four domains:

- IT and IT Management
- Architecture (Enterprise and IT)
- Business Management and
- Project Management

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Topics are (per domain):

IT and IT Management

ABC of ICT
ASL®
CATS CM®
CMMI®
COBIT®
e-CF
ISO/IEC 20000
ISO/IEC 27001/27002
ISPL
IT4IT®
IT-CMF™
IT Service CMM
ITIL®
MOF
MSF
SABSA
SAF
SIAM™
TRIM
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Enterprise Architecture

ArchiMate®
GEA®
Novius Architectuur
Methode
TOGAF®

Business Management

BABOK® Guide
BiSL® and BiSL® Next
BRMBOK™
BTF
EFQM
eSCM
IACCM
ISA-95
ISO 9000/9001
OPBOK
SixSigma
SOX
SqEME®

Project Management

A4-Projectmanagement
DSDM/Atern
ICB / NCB
ISO 21500
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MSP®
P3O®
PMBOK® Guide
Praxis®
PRINCE2®

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Author about this Courseware

Being a trainer myself since 2003, I never liked endless PowerPoint slides with long lists and tons of bullets, copied straight from the book. I believe that it is useless to read the source book aloud, quite the opposite – I think it is very important to stimulate the thinking activity of the students, to motivate them to find more about this particular topic they are studying, to tell a story and to create a vivid picture.

The courseware for “DevOps Foundation” was made with this idea in my mind. I tested and tried the first version for several months, then added more content and changed some slides. Overall, the creation of this courseware was done in an agile way – with the first minimal viable product (MVP) and then with improvement iterations for one year or so.

Now you have the latest version, which helped me to train hundreds of people already. I am really excited about DevOps, as I see huge potential for DevOps implementations in the Enterprise, as well as small and medium businesses. With DevOps, companies around the world can achieve speed to market like was never seen before, with more stability and antifragility. That is exactly what we need in a fast paced and ever changing IT domain.

I am wishing you all the best with this courseware. Welcome to the new world, and have fun building your new knowledge!

-- Oleg Skrynnik

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Self-Reflection of understanding Diagram

‘What you do not measure, you cannot control.’ – Tom Peters

Fill in this diagram to self-evaluate your understanding of the material. This is an evaluation of how well you know the material and how well you understand it. In order to pass the exam successfully you should be aiming to reach the higher end of Level 3. If you really want to become a pro, then you should be aiming for Level 4. Your overall level of understanding will naturally follow the learning curve. So, it’s important to keep track of where you are at each point of the training and address any areas of difficulty.

Based on where you are within the Self-Reflection of Understanding diagram you can evaluate the progress of your own training.

<i>Level of Understanding</i>	<i>Before Training (Pre-knowledge)</i>	<i>Training Part 1 (1st Half)</i>	<i>Training Part 2 (2nd Half)</i>	<i>After studying / reading the book</i>	<i>After exercises and the Practice exam</i>
<i>Level 4 I can explain the content and apply it .</i>					
<i>Level 3 I get it! I am right where I am supposed to be.</i>					Ready for the exam!
<i>Level 2 I almost have it but could use more practice.</i>					
<i>Level 1 I am learning but don't quite get it yet.</i>					

(Self-Reflection of Understanding Diagram)

Write down the problem areas that you are still having difficulty with so that you can consolidate them yourself, or with your trainer. After you have had a look at these, then you should evaluate to see if you now have a better understanding of where you actually are on the learning curve.

Troubleshooting

Problem areas:

Topic:

Part 1

Part 2

You have gone through the book and studied.

You have answered the questions and done the practice exam.

Timetable

Day 1

09:00 - 9:30	Introduction, About this course
09:30 - 11:00	DevOps Basics: DevOps Origins
11:00 - 12:00	DevOps Basics: Definition of DevOps
12:00 - 12:30	Lunch
12:30 - 15:00	DevOps Basics: Reasons for Using DevOps
15:00 - 17:00	DevOps Basics: Misconceptions about DevOps


Day 2

09:00 - 10:30	DevOps Foundation: Lean
10:30 - 12:00	DevOps Foundation: Agile
12:00 - 12:30	Lunch
12:30 - 14:00	DevOps Principles
14:00 - 17:00	DevOps Key Practices: Difference with Traditional Practices


Day 3

09:00 - 11:00	DevOps Key Practices
11:00 - 12:00	Practical Application of DevOps
12:00 - 12:30	Lunch
12:30 - 14:00	Final Notes and Further Steps
14:00 - 16:00	Sample Exam
16:00 - 17:00	DevOps Foundation Exam



DevOps Foundation




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Introduction



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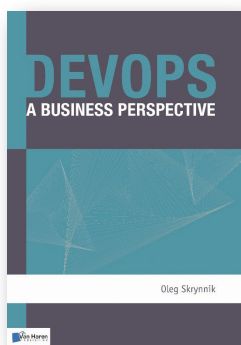


Scope

DevOps Foundation is a certification that validates a professional's knowledge about:

- DevOps Basics;
- DevOps Principles;
- DevOps Key Practices;
- Practical Application of DevOps

Literature



DevOps – a Business Perspective

Author: Oleg Skrynnik

Van Haren Publishing, 2018 (first edition)

ISBN: 9789401803724 (hardcopy)

ISBN: 9789401803731 (eBook)

ISBN: 9789401803748 (ePub)



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|--|--|

Exam requirements and literature matrix

Exam requirement	Exam specification	Literature	Weight %
1. DevOps Basics			25%
	1.1 DevOps Origins	Ch. 1.1, 1.4	
	1.2 Definition of DevOps	Ch. 1.2, 2.1, 3.1	
	1.3 Reasons for using DevOps	Ch. 1.3	
	1.4 Misconceptions about DevOps	Ch. 1.5	
2. DevOps Principles			27.5%
	2.1 Value Stream	Ch. 2.1, 3.1, 3.6, 4.10, 5.7	
	2.2 Deployment Pipeline	Ch. 3.2	
	2.3 Version Control	Ch. 3.3	
	2.4 Configuration Management	Ch. 3.4	
	2.5 Definition of Done	Ch. 3.5	
3. DevOps Key Practices			27.5%
	3.1 Difference with Traditional Practice	Ch. 4.1	
	3.2 DevOps Practices	Ch. 4.2, 4.3, 4.4, 4.5, 4.6, 4.8, 4.9, 4.11	
4. Practical Applications of DevOps			20%
	4.1 Applicability	Ch. 5.1	
	4.2 Limitations	Ch. 5.1	
	4.3 Using Commercial Off-the-shelf Software	Ch. 5.2	
	4.4 Evolving Architecture and Organizational Models	Ch. 4.1, 5.3, 5.4	
	4.5 Iterative Progression	Ch. 5.6	
Total			100%

Exam format and certification

Requirements for certification

- Successful completion of the DevOps Foundation exam.

Exam details

- 60 minutes
- Multiple-choice questions
- Number of questions: 40
- Pass mark: 65% (26 out of 40)
- Open book, notes, or electronic equipment/aides permitted: No

Indication study load

- 60 hours, depending on existing knowledge.



Overview DevOps certification scheme



Before the learning begin...

- Take some time before diving in and think about what you already know in related areas
- Assess your current knowledge in the following topics, make notes of what you know better and what you need to learn more:
 - Agile (Scrum, SAFe, LESS...)
 - Lean (Value Stream, Kanban Method, Toyota Production System...)
 - CI/CD (Continuous Integration, Continuous Delivery...)
 - ITSM (IT Service Management, ITIL, COBIT, ISO 20000...)

Key Terms and Basic Concepts Checklist

- You can use the following checklist as an aid to your study
- During your study, cross the terms and concepts that you have learnt

- | | | |
|------------------------|-----------------------------|--------------------------------|
| • affinity (in DevOps) | • cloud computing | • feedback |
| • agile infrastructure | • collaboration (in DevOps) | • Feedforward |
| • automated testing | • commit code | • Flow |
| • automation | • communication styles | • iteration |
| • blamelessness | • compact | • ITSM (IT Service Management) |
| • build (management) | • Definition of Done | • Ji-Kotei-Kanketsu (JKK) |
| • business value | • deployment pipeline | • Just-in-Time (JiT) |
| • change management | • Development Team | |

Key Terms and Basic Concepts Checklist (cont'd)

- lead time
- lean
- loosely coupled architecture
- microservices
- minimum viable product
- monolithic
- negotiation styles
- non-functional requirement (NFR)
- one-piece-flow
- Operations Team
- organizational learning
- (product) backlog
- pull system
- the agile manifesto
- the lean movement
- tools
- Toyota Production System (TPS)
- value (stream)
- value stream mapping (VSM)
- waste (in lean)
- Waterfall
- WiP Limit
- Work-in-Progress (WiP)

DevOps Basics

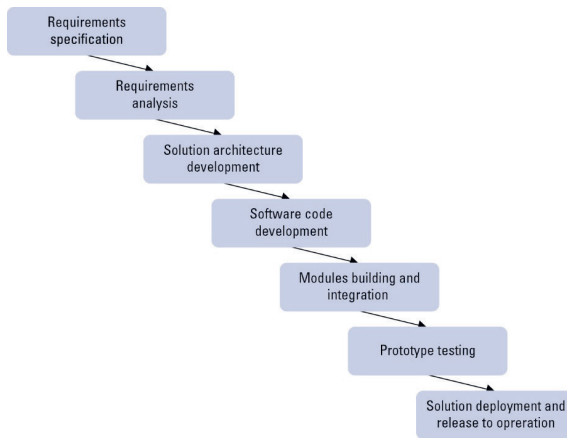


DEVOPS ORIGINS

Key Learning Objectives

- By completing this chapter you will be able to:
 - describe the historical developments from Waterfall to Scrum to Agile
 - describe the developments in virtualization and cloud computing that enable DevOps
 - explain how DevOps developed from a historical perspective

Waterfall Software Development Model



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This model can deliver expected results:

- when the requirements are known and defined from the start
- when there are little changes during the project
- when those changes are not significant
- when there is no stress on fast delivery

Fig. 1.3 An example of a waterfall software development model
Source: DevOps – A Business Perspective

Not For Every Project...



At the end of the 1990s, with the rapid growth of Internet technologies and web programming, downsides of the waterfall model started to affect interaction and understanding between information systems customers (internal or external business) and providers (internal or external software developers).

Agile Manifesto

Individuals and interactions over Processes and tools

Working software over Comprehensive documentation

Customer collaboration over Contract negotiation

Responding to change over Following a plan

That is, while there is value in the items on the right, we value the items on the left more

Is there Agile Heaven?

- Software development is just one of the steps in a value stream for customer
 - IT Infrastructure is rigid
 - IT Infrastructure is fragile



Virtualization

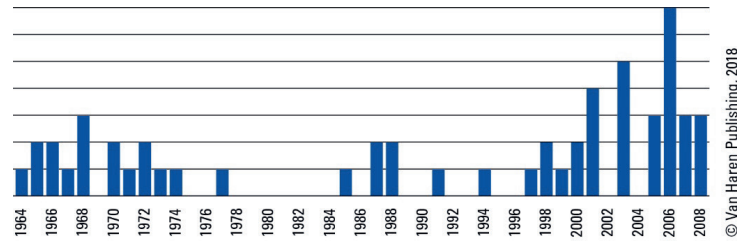


Fig. 1.5 Key virtualization events distributed in time
Source: *DevOps – A Business Perspective*

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Virtualization made it possible not only to use expensive and powerful hardware more efficiently, but also to introduce an additional level of abstraction between the executable code that provides something useful to the customer and the underlying system software.

Cloud computing

Resources offered by commercial providers have become affordable and reliable; they also assured the necessary level of security.



The customers' attitude to the clouds and their use has changed from "someone else is controlling my hardware somewhere" to "I have an infrastructure that I manage remotely".