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EXIN DevOps Professional

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Preparation Guide

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Edition 201803



DevOps

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# 1. Overview

EXIN DevOps Professional (DEVOPSP.EN)

## Scope

DevOps is best known in the field of software services, but its principles are applicable in all contexts where fast delivery of reliable products and services is relevant. DevOps contributes to the success of the overall organization by facilitating the synergy of Agile development, Service Management and Lean improvement while assuring security and maintaining control in a continuous delivery pipeline.

The primary purpose of this module is to test whether the candidate is familiar with DevOps practices in the Three Ways: Flow, Feedback, Learning and Experimentation. The candidate will understand the impact of these organizational and technical changes on their daily work.

## Summary

The word DevOps is a contraction of 'Development' and 'Operations'. DevOps is a set of best practices that emphasize the collaboration and communication of IT-professionals (developers, operators, and support staff) in the lifecycle of applications and services, leading to:

- Continuous Integration: merging all developed working copies to a shared mainline several times a day
- Continuous Deployment: release continuously or as often as possible
- Continuous Feedback: seek feedback from stakeholders during all lifecycle stages

The DevOps practices covered in this certification are derived from the Three Ways:

The First Way is to enable the work to move fast from left to right, from Development to Operations to the customer.

The Second Way is to enable feedback to go fast from right to left, from all stakeholders back into the value stream.

The Third Way is to enable learning by creating a high-trust culture of experimentation and risk-taking.

Moreover, the crucial subjects of security in all stages, and maintaining compliance during change are covered.

The certification has been developed in cooperation with experts in the DevOps work field.

## Context

The EXIN DevOps program:



## Target Group

The EXIN DevOps Professional certification is meant for anyone working within a DevOps environment or in an organization that considers the transition to a DevOps way of working.

The target group includes, but is not limited to:

- Software and Website Developers
- System Engineers
- DevOps Engineers
- Product and Service Owners
- Project Managers
- Test Engineers
- IT Service Management operating and support staff
- Process Managers
- Lean IT Professionals
- Agile Scrum practitioners

## Requirements for certification

- Successful completion of the DevOps Professional exam.
- Pre-knowledge of Agile, Lean and/or IT Service Management, for instance through the EXIN Agile Scrum Foundation exam, LITA Lean IT Foundation exam or EXIN IT Service Management Foundation based on ISO/IEC 20000 exam, is recommended.

## Bloom level

The EXIN DevOps Professional certification tests candidates at the Bloom Levels 2 and 3 according to Bloom's Revised Taxonomy:

- Bloom Level 2: Understanding – a step beyond remembering (Level 1). Understanding shows that candidates can comprehend what is presented and can evaluate how the learning material may be applied in their own environment.  
This type of questions aims to demonstrate that the candidate is able to organize, compare, interpret and choose the correct description of facts and ideas.
- Bloom Level 3: Applying – shows that candidates have the ability to make use of information in a context different from the one in which it was learned.  
This type of questions aims to demonstrate that the candidate is able to solve problems in new situations by applying acquired knowledge, facts, techniques and rules in a different, or new way. The question usually contains a short scenario.

## Examination details

Examination type:	Computer-based or paper-based multiple-choice questions
Number of questions:	40
Pass mark:	65%
Open book/notes:	No
Electronic equipment/aides permitted:	No
Time allotted for examination:	90 minutes

The Rules and Regulations for EXIN's examinations apply to this exam.

## Training

### Contact hours

The recommended number of contact hours for this training course is 16. This includes group assignments, exam preparation and short breaks. This number of hours does not include homework, the exam session and lunch breaks.

### Indication study effort

60 hours, depending on existing knowledge.

### Training provider

You can find a list of our Accredited Training Organizations at [www.exin.com](http://www.exin.com).

## 2. Exam requirements

Exam Requirement	Exam Specification		Weight
<b>1. DevOps Adoption</b>			<b>12.5%</b>
	1.1	Basic Concepts of DevOps	
	1.2	Principles of the Three Ways	
	1.3	Organization	
<b>2. The First Way: Flow</b>			<b>25%</b>
	2.1	Deployment Pipeline	
	2.2	Automated Testing	
	2.3	Continuous Integration	
	2.4	Low-risk Releases	
<b>3. The Second Way: Feedback</b>			<b>30%</b>
	3.1	Telemetry	
	3.2	Feedback	
	3.3	Hypothesis driven development and A/B testing	
	3.4	Review and Coordination	
<b>4. The Third Way: Continual Learning and Experimentation</b>			<b>20%</b>
	4.1	Learning	
	4.2	Discoveries	
<b>5. Information Security and Change Management</b>			<b>12.5%</b>
	5.1	Information Security	
	5.2	Change Management	
<b>Total</b>			<b>100%</b>



## Exam specifications

<b>1. DevOps Adoption</b>	<b>12.5%</b>
1.1 Basic Concepts of DevOps	2.5%
The candidate can...	
1.1.1 <b>describe</b> basic DevOps concepts like continuous delivery, Agile infrastructure, Kata, WIP, technical debt and lead time.	
1.2 Principles of the Three Ways	3.75%
The candidate can...	
1.2.1 <b>distinguish</b> the principles of flow, feedback and continuous learning and experimentation.	
1.2.2 <b>explain</b> the difference between System of Records (SoR) and System of Engagement (SoE) in relationship to DevOps.	
1.3 Organization	6.25%
The candidate can...	
1.3.1 <b>explain</b> how the several DevOps roles work together in order to add value to the business.	
1.3.2 <b>explain</b> the differences between I-shape, T-shape and E-shape in relationship to DevOps.	
1.3.3 <b>explain</b> how to integrate Operations into the daily work of Development.	
<b>2. The First Way: Flow</b>	<b>25%</b>
2.1 Deployment Pipeline	12.5%
The candidate can...	
2.1.1 <b>choose</b> techniques, such as infrastructure as a code and containers, to solve a deployment pipeline problem.	
2.1.2 <b>choose</b> the best solution to optimize the value stream.	
2.1.3 <b>assess</b> a shared version control repository for completeness.	
2.1.4 <b>adapt</b> the Definition of Done (DoD) in order to reflect the DevOps principles.	
2.1.5 <b>explain</b> how tooling can be used to automate the building and configuration of the environment.	
2.2 Automated Testing	5%
The candidate can...	
2.2.1 <b>explain</b> the difference between a non-ideal testing pyramid and an ideal testing pyramid.	
2.2.2 <b>select</b> the intended use of test-driven development in a flow.	
2.3 Continuous Integration	5%
The candidate can...	
2.3.1 <b>choose</b> the optimal branching strategy.	
2.3.2 <b>explain</b> the influence of technical debt on the flow.	
2.3.3 <b>explain</b> how to eliminate technical debt.	
2.4 Low-risk Releases	2.5%
The candidate can...	
2.4.1 <b>discriminate</b> the several release and deployment patterns in order to enable low-risk releases.	
2.4.2 <b>select</b> the right architectural archetype to use.	

<b>3. The Second Way: Feedback</b>	<b>30%</b>
3.1 Telemetry	7.5%
The candidate can...	
3.1.1 <b>describe</b> how telemetry can contribute to optimizing the value stream.	
3.1.2 <b>describe</b> the monitoring framework components.	
3.1.3 <b>explain</b> the added value of self-service access to telemetry.	
3.2 Feedback	10%
The candidate can...	
3.2.1 <b>solve</b> deployment problems using fix forward and roll back techniques.	
3.2.2 <b>change</b> launching guidance requirements checklists to fit into a DevOps guidance.	
3.2.3 <b>apply</b> safety checks using the Launch Readiness Review (LRR) and the Hand-Off Readiness Review (HRR).	
3.2.4 <b>explain</b> how user experience (UX) design can be used as feedback mechanism.	
3.3 Hypothesis-Driven Development and A/B testing	5%
The candidate can...	
3.3.1 <b>explain</b> how A/B testing can be integrated into a release and into feature testing.	
3.3.2 <b>explain</b> how hypothesis driven development can aid the delivery of expected outcome.	
3.4 Review and Coordination	7.5%
The candidate can...	
3.4.1 <b>examine</b> the effectiveness of a pull request process.	
3.4.2 <b>explain</b> the review techniques: pair programming, over-the-shoulder, e-mail pass-around and tool-assisted code review.	
3.4.3 <b>choose</b> the best review technique for a given situation.	
<b>4. The Third Way: Continual Learning and Experimentation</b>	<b>20%</b>
4.1 Learning	10%
The candidate can...	
4.1.1 <b>differentiate</b> between the several Simian Army Monkey types to improve learning.	
4.1.2 <b>conduct</b> a blameless post mortem meeting.	
4.1.3 <b>explain</b> how injection of production failure creates resilience.	
4.1.4 <b>explain</b> when to use game days.	
4.2 Discoveries	10%
The candidate can...	
4.2.1 <b>describe</b> how to use (codified) non-functional requirements (NFR) to design for Operations.	
4.2.2 <b>explain</b> how to build reusable operations user stories into development.	
4.2.3 <b>explain</b> which objects should be stored in the single shared source code repository.	
4.2.4 <b>explain</b> how to convert local discoveries into global improvements.	

<b>5. Information Security and Change Management</b>	<b>12.5%</b>
5.1 Information Security	7.5%
The candidate can...	
5.1.1 <b>explain</b> how to integrate preventative security controls.	
5.1.2 <b>explain</b> how to integrate security in the deployment pipeline.	
5.1.3 <b>explain</b> how to use telemetry for enhancing security.	
5.2 Change Management	5%
The candidate can...	
5.2.1 <b>explain</b> how to maintain security during change.	
5.2.2 <b>explain</b> how to maintain compliance during change.	

### 3. List of Basic Concepts

This chapter contains the terms and abbreviations with which candidates should be familiar.

*Please note that knowledge of these terms alone does not suffice for the exam; the candidate must understand the concepts and be able to provide examples.*

A/B testing	Microservices
Acceptance tests	Monitoring Framework
Agile infrastructure	Monolithic
Andon cord	MTTR
Anomaly detection techniques	Non-functional requirement (NFR)
Antifragility	Non-functional requirement (NFR) testing
Automated tests	Operations
Bad apple theory	OPS liaison
Bad paths	Organisational typology model
Blameless post mortem	Organization archetypes
Blue-green deployment pattern	Over-the-shoulder
Branching strategy	Packages
Brownfield	Pair programming
Business value	Peer review
Canary release pattern	Post mortems
Change categories	Product Owner
Change schedules	Pull request process
Cloud configuration files	QA
Cluster immune system release pattern	Reduce batch size
Code branch	Reduce number of handoffs
Code review forms	Release branch
Codified NFR	Release managers
Commit code	Release patterns
Compliance checking	Sad path
Compliance officer	Safety conditions

Containers	Security testing
Continuous Delivery	Self service capability
Conways law	Shared goals
Defect tracking	Shared operations team (SOT)
Definition of Done (DoD)	Shared version control
Dev rituals	Single repository
Development	Smoke testing
Downwards spiral	Standard deviation
E-mail pass-around	Standard operations
Fast feedback	Static analysis
Feature toggles	Swarming
Feedback	System of Engagement (SoE)
Feedforward	System of Records (SoR)
Gaussian distribution	Technical debt
Greenfield	Technology adaption curve
Hand-off readiness review	Technology executives
Happy paths	Test-Driven Development
(non) Ideal testing pyramid	The Agile Manifesto
Information radiators	The Lean movement
Infosec	The Simian Army: Chaos Gorilla, Chaos Kong, Conformity Monkey, Doctor Monkey, Janitor Monkey, Latency Monkey, Security Monkey
Infrastructure as code	The Three Ways
Integration tests	Theory of constraints
I-shaped, T-shaped, E-shaped	Tool-assisted review
Kaizen Blitz (or Improvement Blitz)	Toyota Kata
Kanban	Transformation team
Kata	Trunk
Latent defects	Value stream
Lauching guidance	Virtualized environment
Launch readiness review	Visualisation
Lead time	Waste

Learning culture	Waste reduction
Logging levels	WIP (Work in Progress / Process)
Loosely coupled architecture	WIP Limit

## 4. Literature

### Exam Literature

- A      The DevOps Handbook: How to Create World-Class Agility, Reliability, and Security in Technology Organizations**  
Gene Kim, Jez Humble, Patrick Debois, John Willis  
ISBN-10: 1942788002  
ISBN-13: 978-1942788003  
IT Revolution Press; 1 edition (2016)

### Additional literature

- B      DevOps Best Practices**  
Bart de Best  
ISBN-13: 978-94-92618-07-8  
Leonon Media (2017)
- C      The Phoenix Project**  
Gene Kim, Kevin Behr, George Spafford  
ISBN-10: 0988262576  
ISBN-13: 978-0988262577  
IT Revolution Press (January 10, 2013)
- D      Other sources:**  
<http://newrelic.com/devops>  
<http://devops.com/>

### Comment

Additional literature is for reference and depth of knowledge only.

## Literature reference

Exam requirement	Exam specification	Literature	Literature reference
1	1.1	A	Preface, Introduction of Part 1, and Chapters 1 and 21
	1.2	A	Chapters 2, 3, 4 and 5
	1.3	A	Chapters 6, 7 and 8
2	2.1	A	Chapters 5, 6, 7, 8, 9 and 11
	2.2	A	Chapter 10
	2.3	A	Chapters 11, 21 and 22
	2.4	A	Chapters 12 and 13
3	3.1	A	Chapters 14 and 15
	3.2	A	Chapter 16
	3.3	A	Chapter 17
	3.4	A	Chapter 18
4	4.1	A	Chapter 19 and Appendix 9
	4.2	A	Chapter 20
5	5.1	A	Chapter 22
	5.2	A	Chapter 23





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