Preparation Guide

Edition 201805

Content

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, and Continual 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.

Examination details

Examination type:	Multiple-choice questions
Number of questions:	40 questions
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.

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.

Training

Contact hours

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

Indication study effort

60 hours, depending on existing knowledge.

Training organization

You can find a list of our accredited training organizations at www.exin.com.

2. Exam requirements

The exam requirements are specified in the exam specifications. The following table lists the topics of the module (exam requirements) and the subtopics (exam specifications).

Exam requirement	Exam specification	Weight
1. DevOps Adoption		**12.5%**
	1.1 Basic Concepts of DevOps	2.5%
	1.2 Principles of the Three Ways	3.75%
	1.3 Organization	6.25%
2. The First Way: Flow		**25%**
	2.1 Deployment Pipeline	12.5%
	2.2 Automated Testing	5%
	2.3 Continuous Integration	5%
	2.4 Low-risk Releases	2.5%
3. The Second Way: Feedback		**30%**
	3.1 Telemetry	7.5%
	3.2 Feedback	10%
	3.3 Hypothesis driven development and A/B testing	5%
	3.4 Review and Coordination	7.5%
4. The Third Way: Continual Learning and Experimentation		**20%**
	4.1 Learning	10%
	4.2 Discoveries	10%
5. Information Security and Change Management		**12.5%**
	5.1 Information Security	7.5%
	5.2 Change Management	5%
	Total	100%

Exam specifications

1 DevOps Adoption

1.1 Basic Concepts of DevOps

The candidate can…

1.1.1 **describe** basic DevOps concepts like continuous delivery, Agile infrastructure, Kata, WIP, technical debt and lead time.

1.2 Principles of the Three Ways

The candidate can…

1.2.1 **distinguish** the principles of flow, feedback and continuous learning and experimentation.

1.2.2 **explain** the difference between System of Records (SoR) and System of Engagement (SoE) in relationship to DevOps.

1.3 Organization

The candidate can…

1.3.1 **explain** how the several DevOps roles work together in order to add value to the business.

1.3.2 **explain** the differences between I-shape, T-shape and E-shape in relationship to DevOps.

1.3.3 **explain** how to integrate Operations into the daily work of Development.

2 The First Way: Flow

2.1 Deployment Pipeline

The candidate can…

2.1.1 **choose** techniques, such as infrastructure as a code and containers, to solve a deployment pipeline problem.

2.1.2 **choose** the best solution to optimize the value stream.

2.1.3 **assess** a shared version control repository for completeness.

2.1.4 **adapt** the Definition of Done (DoD) in order to reflect the DevOps principles.

2.1.5 **explain** how tooling can be used to automate the building and configuration of the environment.

2.2 Automated Testing

The candidate can…

2.2.1 **explain** the difference between a non-ideal testing pyramid and an ideal testing pyramid.

2.2.2 **select** the intended use of test-driven development in a flow.

2.3 Continuous Integration

The candidate can…

2.3.1 **choose** the optimal branching strategy.

2.3.2 **explain** the influence of technical debt on the flow.

2.3.3 **explain** how to eliminate technical debt.

2.4 Low-risk Releases

The candidate can…

2.4.1 **discriminate** the several release and deployment patterns in order to enable low-risk releases.

2.4.2 **select** the right architectural archetype to use.

3 The Second Way: Feedback

3.1 Telemetry

The candidate can…

- 3.1.1 **describe** how telemetry can contribute to optimizing the value stream.
- 3.1.2 **describe** the monitoring framework components.
- 3.1.3 **explain** the added value of self-service access to telemetry.

3.2 Feedback

The candidate can…

- 3.2.1 **solve** deployment problems using fix forward and roll back techniques.
- 3.2.2 **change** launching guidance requirements checklists to fit into a DevOps guidance.
- 3.2.3 **apply** safety checks using the Launch Readiness Review (LRR) and the Hand-Off Readiness Review (HRR).
- 3.2.4 **explain** how user experience (UX) design can be used as feedback mechanism.

3.3 Hypothesis-Driven Development and A/B testing

The candidate can…

- 3.3.1 **explain** how A/B testing can be integrated into a release and into feature testing.
- 3.3.2 **explain** how hypothesis driven development can aid the delivery of expected outcome.

3.4 Review and Coordination

The candidate can…

- 3.4.1 **examine** the effectiveness of a pull request process.
- 3.4.2 **explain** the review techniques: pair programming, over-the-shoulder, e-mail pass-around and tool-assisted code review.
- 3.4.3 **choose** the best review technique for a given situation.

4 The Third Way: Continual Learning and Experimentation

4.1 Learning

The candidate can…

- 4.1.1 **differentiate** between the several Simian Army Monkey types to improve learning.
- 4.1.2 **conduct** a blameless post mortem meeting.
- 4.1.3 **explain** how injection of production failure creates resilience.
- 4.1.4 **explain** when to use game days.

4.2 Discoveries

The candidate can…

- 4.2.1 **describe** how to use (codified) non-functional requirements (NFR) to design for Operations.
- 4.2.2 **explain** how to build reusable operations user stories into development.
- 4.2.3 **explain** which objects should be stored in the single shared source code repository.
- 4.2.4 **explain** how to convert local discoveries into global improvements.

5 Information Security and Change Management

5.1 Information Security

The candidate can…

5.1.1 **explain** how to integrate preventative security controls.

5.1.2 **explain** how to integrate security in the deployment pipeline.

5.1.3 **explain** how to use telemetry for enhancing security.

5.2 Change Management

The candidate can…

5.2.1 **explain** how to maintain security during change.

5.2.2 **explain** 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
Acceptance tests
Agile infrastructure
Andon cord
Anomaly detection techniques
Antifragility
Automated tests
Bad apple theory
Bad paths
Blameless post mortem
Blue-green deployment pattern
Branching strategy
Brownfield
Business value
Canary release pattern
Change categories
Change schedules
Cloud configuration files
Cluster immune system release pattern
Code branch
Code review forms
Codified NFR
Commit code
Compliance checking
Compliancy officer
Containers
Continous Delivery
Conway's law
Defect tracking
Definition of Done (DoD)
Dev rituals
Development
Downward spiral
E-mail pass-around
Fast feedback
Feature toggles
Feedback
Feedforward
Gaussian distribution
Greenfield
Microservices
Monitoring Framework
Monolithic
MTTR
Non-functional requirement (NFR)
Non-functional requirement (NFR) testing
Operations
OPS liaison
Organizational typology model
Organization archetypes
Over-the-shoulder
Packages
Pair programming
Peer review
Post mortems
Product Owner
Pull request process
QA
Reduce batch size
Reduce number of handoffs
Release branch
Release managers
Release patterns
Sad path
Safety conditions
Security testing
Self service capability
Shared goals
Shared operations team (SOT)
Shared version control
Single repository
Smoke testing
Standard deviation
Standard operations
Static analysis
Swarming
System of Engagement (SoE)
System of Records (SoR)
Technical debt
Technology adoption curve

Hand-off readiness review (HRR)
Happy paths
(non) Ideal testing pyramid
Information radiators
Infosec

Infrastructure as code
Integration tests
I-shaped, T-shaped, E-shaped
Kaizen Blitz (or Improvement Blitz)
Kanban
Kata
Latent defects
Lauching guidance
Launch readiness review (LRR)
Lead time
Learning culture
Logging levels
Loosely coupled architecture

Technology executives
Test-Driven Development
The Agile Manifesto
The Lean movement
The Simian Army: Chaos Gorilla, Chaos Kong, Conformity Monkey, Doctor Monkey, Janitor Monkey, Latency Monkey, Security Monkey

The Three Ways
Theory of constraints
Tool-assisted review
Toyota Kata
Transformation team
Trunk
Value stream
Virtualized environment
Visualisation
Waste
Waste reduction
WIP (Work in Progress / Process)
WIP Limit

4. Literature

Exam literature

The knowledge required for the NAME exam is covered in the following literature:

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

Additional literature

B. Bart de Best
DevOps Best Practices
Leonon Media (2017)
ISBN-13: 978-94-92618-07-8

C. Gene Kim, Kevin Behr, George Spafford
The Phoenix Project
IT Revolution Press (January 10, 2013)
ISBN-10: 0988262576
ISBN-13: 978-0988262577

D. Other sources:
http://newrelic.com/devops
http://devops.com/

Comment

Additional literature is for reference and depth of knowledge only.

Literature matrix

Exam requirement	Exam specification	Literature
1. DevOps Adoption		
	1.1 Basic Concepts of DevOps	Preface, Introduction of Part 1, and Chapters 1 and 21
	1.2 Principles of the Three Ways	Chapters 2, 3, 4 and 5
	1.3 Organization	Chapters 6, 7 and 8
2. The First Way: Flow		
	2.1 Deployment Pipeline	Chapters 5, 6, 7, 8, 9 and 11
	2.2 Automated Testing	Chapter 10
	2.3 Continuous Integration	Chapters 11, 21 and 22
	2.4 Low-risk Releases	Chapters 12 and 13
3. The Second Way: Feedback		
	3.1 Telemetry	Chapters 14 and 15
	3.2 Feedback	Chapter 16
	3.3 Hypothesis driven development and A/B testing	Chapter 17
	3.4 Review and Coordination	Chapter 18
4. The Third Way: Continual Learning and Experimentation		
	4.1 Learning	Chapter 19 and Appendix 9
	4.2 Discoveries	Chapter 20
5. Information Security and Change Management		
	5.1 Information Security	Chapter 22
	5.2 Change Management	Chapter 23

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