COURSEWARE

DevOps Professional

Courseware

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EXIN DevOps PROFESSIONAL

DevOps Professional Courseware

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Course introduction

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 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 course/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.
Managing security in all stages and maintaining compliance during change are also covered.

This course, and certification, is meant for anyone working within a DevOps environment or in an organization considering moving 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

Table of content

Timetable

	Day 1
09h00 – 09h30	Introduction
09h30 – 11h00	Module 1 - DevOps Adoption
§1.1-§1.2	*Break*
11h30-13h00	Module 2 - The First Way
13h00-14h00	*Lunch*
14h00-15h00	Module 2 continued
	Break
15h00-17h30	Module 3 - The Second Way
§3.1-§3.2	*Break*
	Day 2
09h00-09h30	Recap day 1
09h30-11h30	Module 4: The Third Way
§4.1-§4.2	*Break*
12h00-13h00	Module 5: Information Security and Change Management
13h00-15h00	Break: lunch and Personal revision and exam preparation
15h15-15h30	*Room prep for exam. Clear desks, ensure spacing between candidates etc*
15h30-17h00	Live exam

Note: breaks are only indicative.

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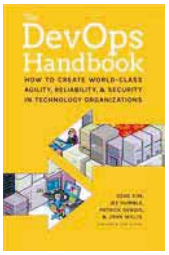
About this course

- Introduction
- Devops Adoption
- The First Way: Flow
- The Second Way: Feedback
- The Third Way: Continual Learning and Experimentation
- Information Security and Change Management (ISCM)

Introduction

- Let's meet & Goals
- Terms
- Program

Literature



- This courseware is based on The DevOps handbook.
  - Gene Kim, Jez Humble, Patrick Debois, John Willis (2016)
- This is also the source material for the exam

Additional literature

You may find it useful to read "The Phoenix Project"

Requirements for certification

- Successful completion of the DevOps Professional exam.
- Knowledge of Agile, Lean and/or IT Service Management is recommended.

Exam Format and training

Exam details

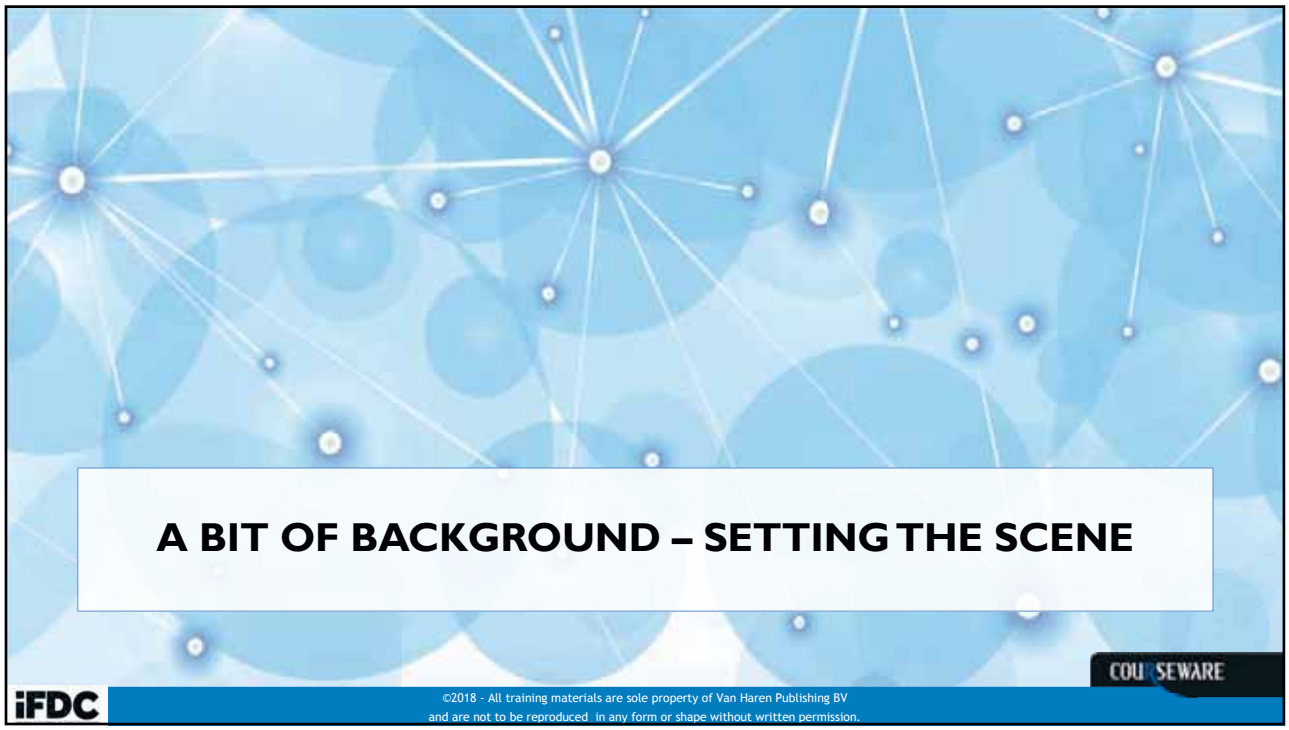
- 90 minutes
- Computer-based or paper-based multiple-choice questions
- Number of questions: 40
- Pass mark: 65% (26 out of 40)
- **Closed book**: no notes or electronic equipment/aides permitted

Training

- 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.

Exam Scope

Syllabus area	Weighting
DevOPs Adoption	12.5%
The First Way	25%
The Second Way	30%
The Third Way	20%
Information Security and Change Management	12.5%
Total	**100%**



Background

- DevOps merges many philosophical and management movements, ideas, frameworks
- Based on years of learning, and pain
- Brings together Bodies of Knowledge (BoK) from Lean, Theory of Constraints, Toyota, human behaviours, ITSM……..
- Often seen as logical progression of Agile movement from early 2000s

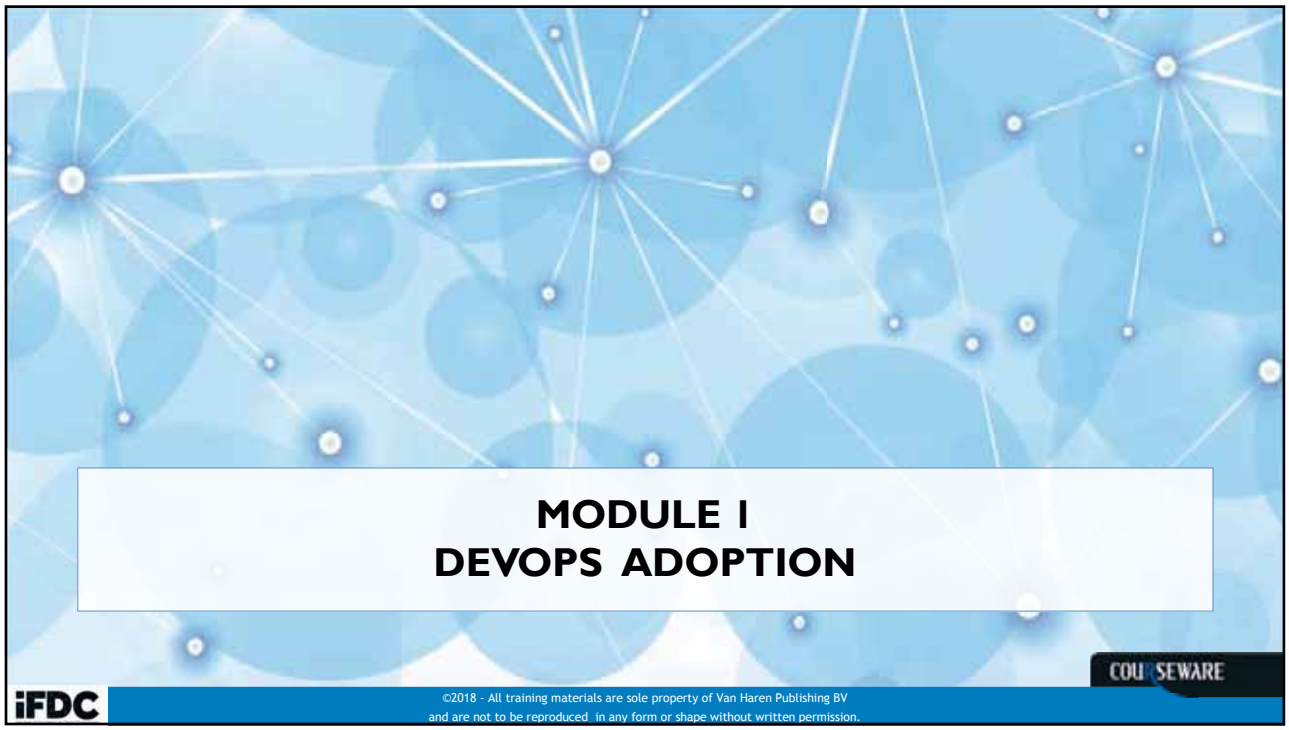
Background

- Lean Movement
  - how to create value for the customer through systems thinking
- Agile Manifesto
- Agile Infrastructure and Velocity
  - apply Agile principles to infrastructure as well as code
- Continuous Delivery Movement
  - Role of the Deployment Pipeline
- Toyota Kata
  - daily, habitual practice of improvement work

Agile Manifesto

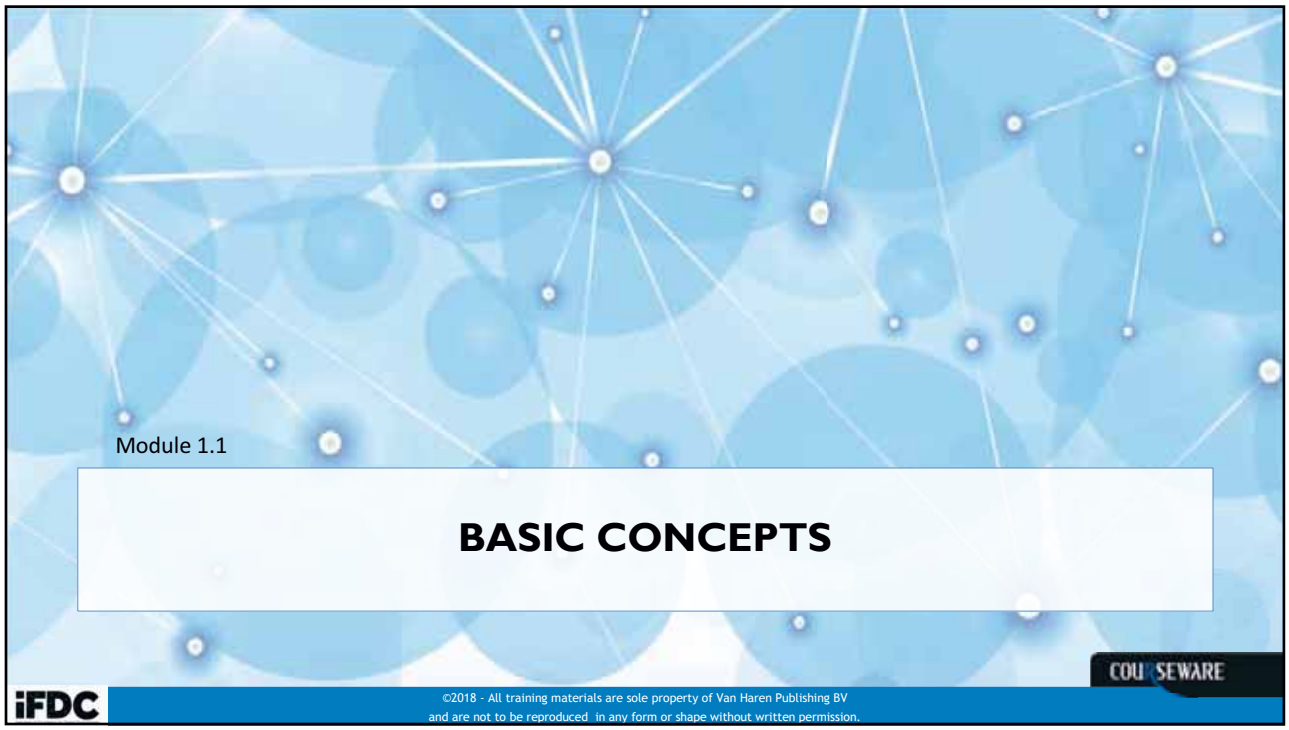
WE VALUE

Individuals and interactions		Processes and tools
Working software	OVER	Comprehensive documentation
Customer collaboration		Contract negotiations
Responding to change		Following a plan



1. DevOps Adoption

- Basic concepts (1.1) [2.5%]
- Principles of the Three Ways (1.2) [3.75%]
- DevOps Transformation (1.3)
- Organization (1.4) [6.25%]



1.1 Basic Concepts - overview

- Continuous Delivery
- Agile Infrastructure
- Kata
- Work in Progress (WIP)
- Technical Debt
- Lead Time

1.1 Basic concepts - 1

- Continuous Delivery: *a methodology that focuses on making sure software is always in a releasable state throughout its lifecycle.*
  - Includes Continuous Integration: “developers commit code at least daily”
  - Depends on Continuous Testing: “the process of executing automated tests as part of the deployment pipeline to obtain immediate feedback“
  - Supports Continuous Deployment/Deployment pipeline

1.1 Basic Concepts - 2

- Agile Infrastructure: *Treat your infrastructure as an application (e. g. code)*
  - It should match your production environment
    - Use virtualization techniques
    - Use the cloud
  - Work on API-driven abstractions

1.1 Basic Concepts - 3

- Improvement Kata: *a structured way of thinking and acting that you practise until the pattern becomes a habit*
  - A daily, habitual practice of improvement work.
  - A constant cycle of setting desired future states (long-term), setting weekly targets (short-term), improving work daily
  - Uses Plan Do Check Act cycle: PDCA (Deming)

1.1 Basic Concepts - 4

- Work-in-Progress (WIP): *Work that has entered the development process but is not yet finished and available to a customer or user.*
  - Refers to all assets or work products of a product or service that are currently being worked on or waiting in a queue to be worked on
  - Kanban is a method which allows you visualise flow and pull it through when people are ready.

1.1 Basic Concepts - 5

- Technical Debt: *the implied cost of additional rework caused by choosing an easy solution now instead of using a better approach that would take longer*

  Examples:

  Business pressures, where the business considers getting something released sooner before all of the necessary changes are complete, builds up technical debt comprising those uncompleted changes

  Insufficient up-front definition, where requirements are still being defined during development, development starts before any design takes place. This is done to save time but often has to be reworked later.

1.1 Basic Concepts - 6

- Lead time: *Time from initial request to final delivery*
  - Process time clock only starts when we start actual work (also known as Cycle time)

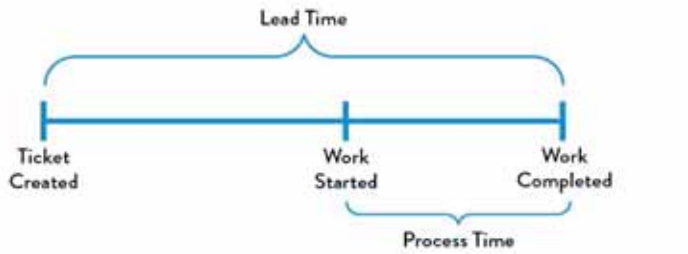
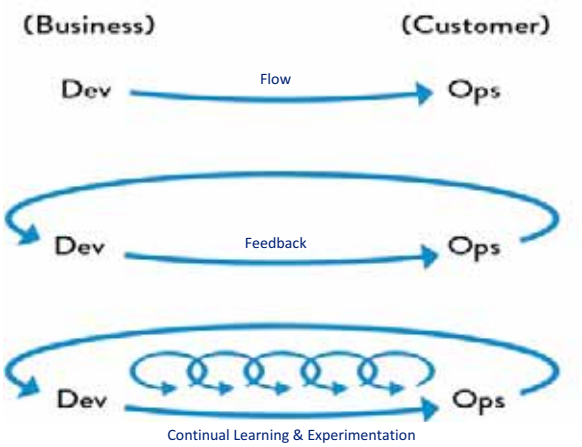


Figure 2. *Lead time vs. process time of a deployment operation*

Module 1.2

PRINCIPLES OF THE THREE WAYS

1.2 Principles of the Three Ways -1



1.2 Principles of the Three Ways - 2

- First Way: enables fast left-to-right flow of work from Development to Operations to the customer. Also called “shift-right.
- Second Way: enables the fast and constant flow of feedback from right to left at all stages of your value stream. Also called “shift-left”
- Third Way: enables the creation of a generative, high-trust culture which supports
  - a dynamic, disciplined, and scientific approach to experimentation
  - risk-taking, facilitating the creation of organizational learning

1.2 The First Way - 3

- Understand the entire system, not just parts
- In order to maximize flow, you need to understand it: make work visible, reduce your batch sizes and intervals of work
- Limit WIP (work-in-progress)
- Reduce the number of handoffs
- Increase flow by understanding and removing constraints
- Build in quality by preventing defects from being passed to downstream work centers, and constantly optimize for the global goals.
- Never allow local demands to cause global degradation

1.2 Theory of Constraints - 4

- ***A methodology for identifying the most important limiting factor (i.e., constraint) that stands in the way of achieving a goal and then systematically improving that constraint until it is no longer the limiting factor.***
- 1. Identify the constraint
- 2. Exploit the constraint (quick wins)
- 3. Subordinate the constraint (process review)
- 4. Elevate the constraint
- 5. Avoid inertia