DASA

DEVOPS AGILE
SKILLS ASSOCIATION

DASA DEVOPS FUNDAMENTALS

Syllabus

Version 1.0.1

February 2017

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Previous	1.0.0	May 2016
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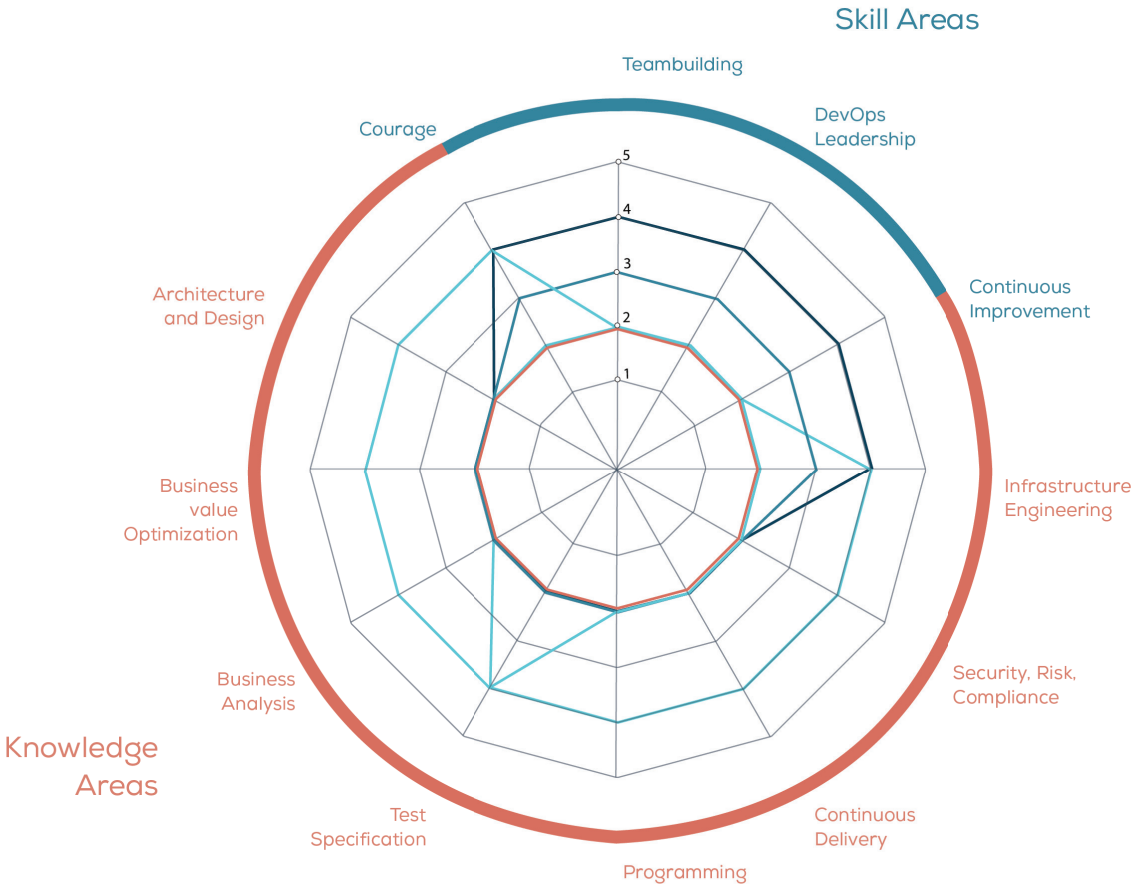
SCOPE AND PURPOSE OF THIS DOCUMENT

The purpose of this document is to inform all parties interested in the DevOps Fundamentals course of the areas covered in the course.

THE DASA DEVOPS COMPETENCE MODEL

The DevOps Agile Skills Association (DASA) competence framework identifies 8 knowledge areas (depicted in red-colored text) and 4 skills (depicted in blue-colored text) that are relevant in DevOps, as shown in the following figure.



1- novice / 2- competent / 3- proficient / 4 - expert / 5 - master

Every individual operating in a DevOps team requires to be competent at all 8 knowledge areas and proficient at the 4 skill levels. In order for DevOps teams to be effective, they require all 12 areas to be at the Expert level. Individual team members can specialize in specific areas, in order for teams to achieve these capabilities.

DASA DEVOPS FUNDAMENTALS

Up to 200 times faster software deployment, 30 times increased deployment frequency, and 60 times higher change success rates, organizations such as Netflix, Spotify, and Facebook are revolutionizing the IT game by successfully implementing DevOps principles. The data does not lie. You do not have to be a hot Web company or a monster enterprise to be a DevOps leader. Companies, large or small and young or old, have magnificently made the transition and have the proof of success in their pockets.

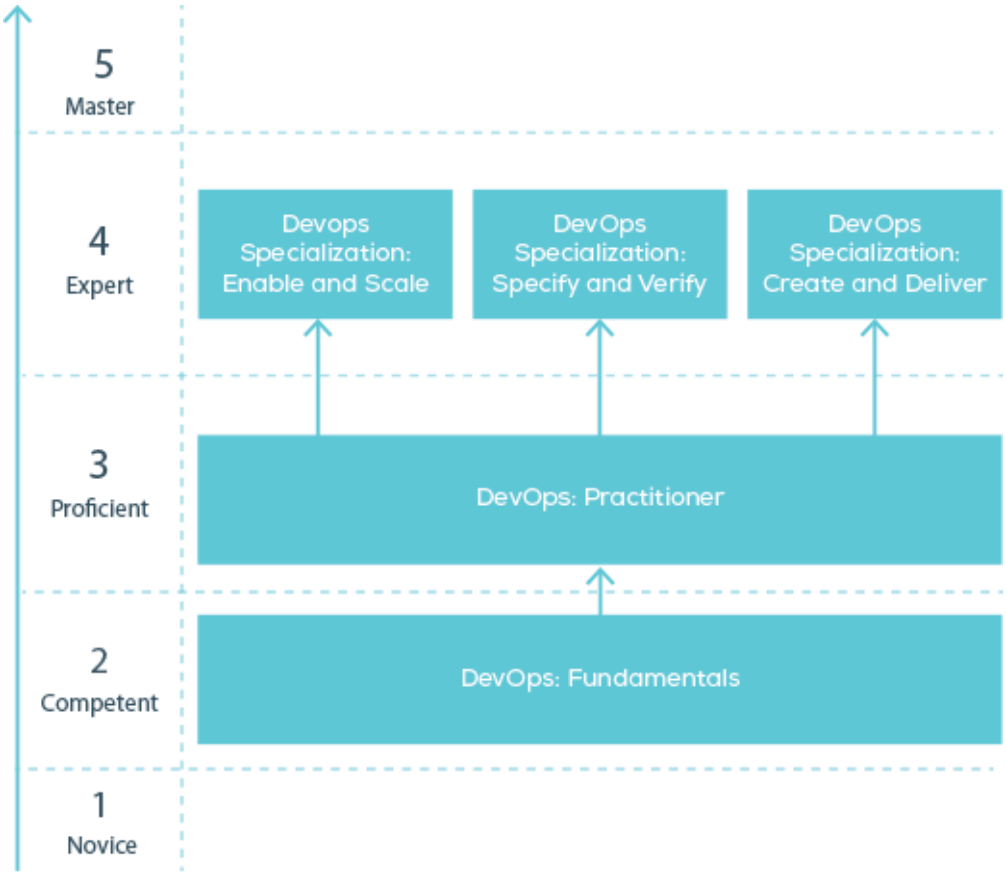
DevOps training is the starting point for an organization going on the DevOps journey. Improved workflows and faster deployment starts with a core understanding of DevOps fundamental concepts by anyone involved in an Agile and/or DevOps team.

DASA develops and evangelizes a vendor neutral DevOps qualification program for professionals, generates interest and awareness for the need for knowledge and skill development, promotes open source certification for DevOps knowledge and skills, and ensures quality of training for the market through a logical and threshold-driven qualification program.

Anyone can participate in defining role-based competences, learning paths, and qualification schemes. All existing learning content that maps against the DASA knowledge and skill areas has value. DASA will map content and demonstrate relevance and will maintain an open and

logical operating model for training delivery, as shown in the following figure.

DASA DevOps Fundamentals provides an extensive introduction to the core Agile DevOps principles covering the essential knowledge and skill competences that have been defined by DASA.



The DevOps Fundamentals qualification is designed to provide the core education necessary to build your DevOps vocabulary and to understand its principles and practices. With the help of key DevOps concepts and terminology, real-life case studies, examples and interactive group discussions and extensive exercises in each module you will acquire a fundamental understanding of DevOps.

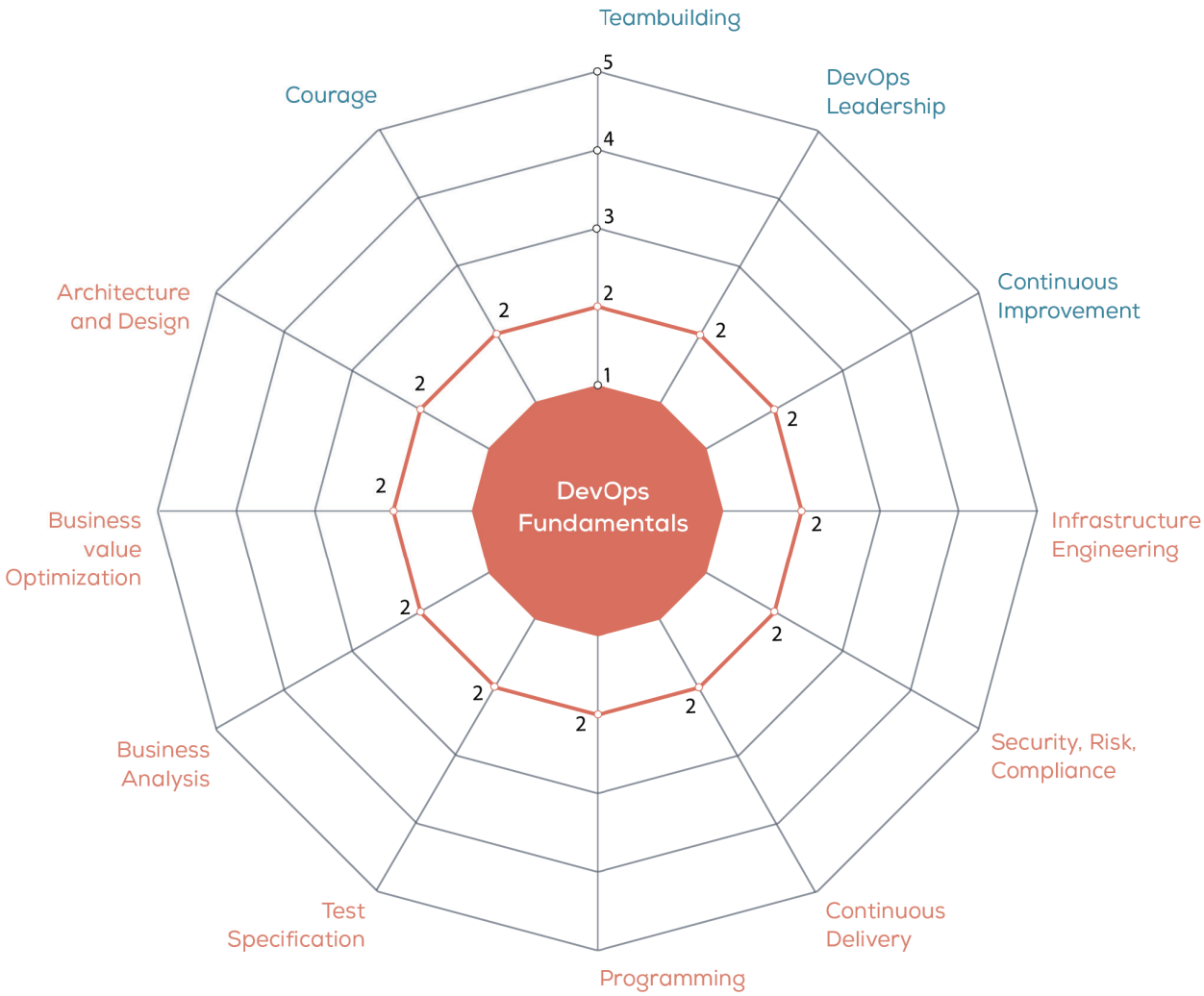
QUALIFICATION OBJECTIVES

When you have acquired the required knowledge from this course, you will be able to:

- Explain the drivers responsible for the emergence of DevOps.
- Define and discuss the key concepts and principles of DevOps.
- List and explain the business benefits of DevOps and continuous delivery.
- Describe the Service Delivery process.
- Explain the concepts of test automation, infrastructure automation, and build and deployment automation.
- Describe how DevOps relates to Lean and Agile methodologies.
- Summarize case studies of IT organizations that are making the transformation to Adaptive IT and DevOps models.
- List the most common and popular DevOps tools.
- Discuss the critical success factors for DevOps implementation.

HOW DOES DEVOPS FUNDAMENTALS FIT INTO THE DASA COMPETENCE FRAMEWORK?

After completing this course, you will cover the area marked as DevOps Fundamentals in the following figure of the DASA qualification scheme. As a result, you will reach the "Competent" level of the scheme.



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TARGET AUDIENCE

The DevOps Fundamentals qualification is primarily aimed at:

- Individuals involved in IT development, IT operations, or IT service management

- Individuals whose role are touched by DevOps and continuous delivery, such as the following IT roles:

  - DevOps engineers
  - Product owners
  - Integration specialists
  - Operations managers
  - Incident and change managers
  - System administrators
  - Network administrators
  - Business managers
  - Automation architects
  - Enterprise architects

COURSE REQUIREMENTS

Basic familiarity with Agile, Scrum, Lean, and ITSM principles is beneficial.

CERTIFICATION REQUIREMENTS

You will receive the required certification from DASA on successful completion of the DASA DevOps Fundamentals exam.

EXAM DETAILS

The characteristics of the DASA DevOps Fundamentals exam are:

Exam Format:

- Closed-book format
- Web-Based
- Participants may bring scratch paper

Questions:

- 40 multiple choice questions

Passing Score:

- 65%

Exam Duration:

- 60 minutes
- 15 minutes extra time for non-native English speakers.

SYLLABUS AREAS

DEVOPS INTRODUCTION

Emergence of DevOps:

- Digital Transformation and DevOps
- Why organizations should do DevOps?
- Business Case for DevOps
- DevOps History
- Benefits of DevOps

Core Concepts of DevOps:

- DevOps Definitions
- Culture of High Performance IT
- How DevOps is tightly intertwined with Agile and Lean IT?
- DevOps Principles and Aspects of IT

DevOps Agile Skills Association (DASA):

- DevOps Skills Areas, Knowledge Areas, and Competence Framework
- DASA Qualification Scheme, Mission, and Vision

CULTURE

Introduction to a DevOps Culture:

- Build Around Teams: Facilitated Lean Product 'Companies'
- The Boston Consultancy Group (BCG) Matrix
- The Three Horizons Model

- What is DevOps culture?
- Cultural Aspects of a DevOps Team
- DevOps Environment: Service Mindset and Quality at the Source
- What context to provide to facilitate growth areas for teams?

Key Elements of DevOps:

- What is a team?
- Intrinsically Motivated Teams
- Collaboration: A Success Factor of a Team
- Visual Management: A Key Tool of Teambuilding
- Importance of Quality at the Source
- Cost of Accumulating Technical Debt
- Role of Continuous Improvement in Solving Problems
- Structured Problem-Solving
- The Kaizen Mindset: Tackling the Root Cause of Problems
- Relationship Between Experimentation and Complications
- Courage to Act: A Key Behavior of a DevOps Team
- Courage and Experimentation
- Courageous Behavior Requires Safety
- Experimentation Meetups: A Key Tool of Courage
- Leadership in a DevOps Environment
- Mission Command Versus Central Command
- Importance of Leadership to Overcome Five Barriers of Effective Collaboration

- Leadership and Feedback
- Role of Leaders in Stimulating the Use of Tools to Develop Effective Habits
- Feedback: A Key Leadership Tool

Implementation of a DevOps Culture:

- How to build a DevOps culture?
- Impact of Treating Change as a Program
- Growing Culture: Experimenting, Measuring, and Probing
- Importance of Tracking the Movement Towards a DevOps Culture
- Cultural Change: A Collective Movement

ORGANIZATION

Organizational Models:

- Impact of DevOps on the Organization
- Alignment of Organizational Model with IT Services
- Traditional Structuring of Teams and Waste
- DevOps "Literally" is No Solution
- Importance of DevOps Hybrid Versions
- Activity-Focused Versus Product-Focused Approaches
- DevOps Organigram

Autonomous Teams:

- What is autonomy?
- Autonomy of Teams
- Criteria for Autonomous Teams

- Decoupling Point: A Key Consideration for Autonomous Teams
- Conway's Law and Organizations' Architecture
- A Real-life Example: Solving the Autonomy Problems

Architecting for DevOps:

- Aim of the IT Architecture
- Focus on Building Qualities
- Smaller Services
- Relation Between Complexity and Quality
- Micro Services Architecture (MSA) and its Characteristics
- MSA Supports Faster, Cheaper, Better Software Development
- Architecting for Systemic Resilience
- Moving from Legacy to Smaller Services

Governance:

- DevOps Governance
- Governance Within Teams and Between Multiple Teams
- Scrum of Scrums with Agile Teams to Coordinate and Collaborate

PROCESSES

Process Basics

- What is a process?

DevOps in Relation to ITSM:

- ITSM
- DevOps and ITSM

Agile and Scrum:

- Traditional Versus Agile
- Role of Multidisciplinary Feature Teams
- The Agile Manifesto
- The Scrum Flow
- Advantages of Working Agile

Optimizing Processes Using Lean:

- What is Lean?
- The Eight Types of Lean Wastes
- Optimization of Processes Using Value Stream Mapping

Business Value Optimization and Business Analysis Using Story Mapping:

- Role of Minimal Viable Product in an Agile Process
- How Story Mapping works?
- Role of Slices in Story Mapping

AUTOMATION

Automation for Delivery of Software:

- Automation of Routine Jobs
- Automation Changes the Focus Towards Engineering Tasks
- DevOps Teams and Focus on the Delivery of Value
- Everything as Code

Continuous Delivery Core Concepts:

- What is continuous delivery?
- Benefits of Automating Continuous Delivery

- Cycle Time Reduction: Continuous Delivery Primary Goal
- Primary Principles of Continuous Delivery
- Continuous Delivery Versus Integration and Deployment
- Continuous Delivery Focus Topics

Continuous Delivery Automation Concepts:

- Software has to Flow
- Impact of Continuous Delivery on a DevOps Team's Performance
- Types of Feedback
- Fail Fast: Immediate and Visible Failure!
- DevOps Versus Continuous Delivery

Continuous Delivery Automation Focus Topics:

- Automation Build and Software Package Delivery Flow
- Automated Test and Optimized Software Validation (Tests)
- Automated Test: DevOps Merges Specification and Verification
- Automated Deployment and its Benefits
- Deployment Strategies
- Automated Provisioning
- Containerization (Microservices)
- Continuous Delivery Backlog

Emergence of Cloud Technology and Principles:

- Emergence of Cloud Computing
- Cloud Services, Self Service Infrastructure, Platform, and Software
- National Institute of Standardization (NIST) Cloud Principles

Cloud Service Concepts in a DevOps Organization:

- Cloud Principles in DevOps Organizations
- Different Conversations Between Development and Operations in a Traditional Organization
- Different Conversations Between Development and Operations in a DevOps Organization
- DevOps Platform Teams as a "Cloud" Service Provider
- DevOps Business System Product and Platform Product Teams
- Different Types of Clouds to Operate

Automated Provisioning Concepts:

- Pets Versus Cattle
- Desired State Configuration to Automate Environments
- Automated Provisioning with Mutable Infrastructure and Immutable Infrastructure
- Continuous Delivery for Platform Products
- Automated Provisioning and Engineering Mindset

Platform Product Characteristics and Application Maturity:

- Services Required by DevOps Business System Teams
- Product Teams, Cloud Services, and Freedom

- Use of Platform Services and Maturity of Applications
- How to apply Cloud concepts in an organization?

MEASURE AND IMPROVEMENT:

Importance of Measurement:

- Need of Measurement and Feedback
- Importance of Feedback: Three Ways Model
- Measurements and CALMS
- Relation Between Measurement and Responsibility

Choosing the Right Metrics

- Survivorship Bias
- Actions Based on Measurements
- Performance Metrics Versus Performance Predictors
- Measuring Leading Indicators for Culture, Organizations, Process Efficiency, Software Development Automation, Data Center Automation, and Measurements
- Top Practices Correlated with Deployment Frequency, Lead Time for Changes, and Mean Time to Recover (MTTR)
- Top Five Predictors of IT Performance
- IT Performance: Throughput Versus Stability

Monitoring and Logging:

- Continuous Monitoring and its Scope
- Optimized Monitoring for DevOps
- Collecting Feedback from an Automated Software Delivery Pipeline

- Dashboards to Build the Feedback Culture (Release Dashboard, Test and Quality Dashboard, Build Dashboard, Performance Dashboard, and Product Usage Dashboard)
- Importance of Logging Stakeholders and Usage Examples

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