EXIN EPI Certified Data Centre Professional

Preparation Guide

Edition 201706

EPI® DATA CENTRE MANAGEMENT

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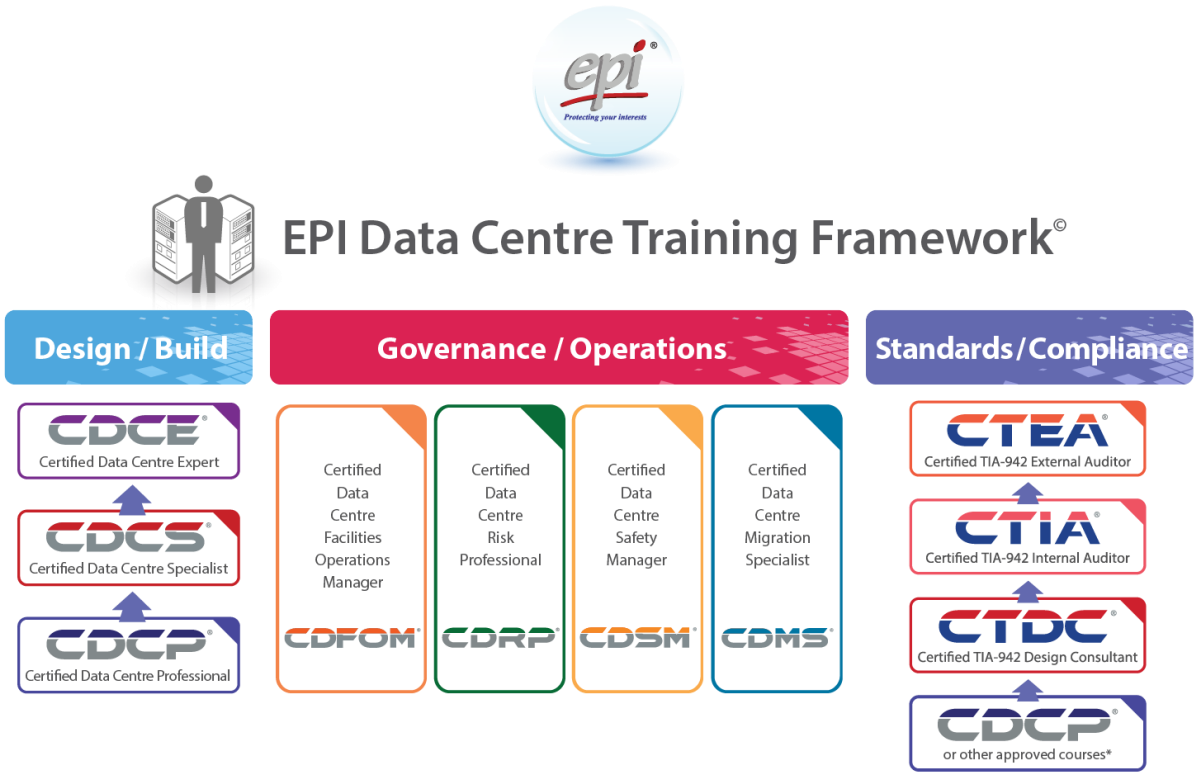
1. Overview

EXIN EPI Certified Data Centre Professional (CDCP.EN)

Scope

Certified Data Centre Professional (CDCP®) is a certification within the EPI Data Centre Training Framework (see Figure below) that validates a professional's knowledge of and competences in key components of data centres. CDCP is part of a larger structure of certifications for professionals working in data centres.



Summary

Many enterprises rely on IT for the delivery of business-critical services. It is vital that the mission critical data centre is designed, maintained and operated with high availability and efficiency in mind.

The Certified Data Centre Professional knows the requirements for setting up and improving key aspects of the data centre such as power infrastructure, cooling, security, cabling and safety to ensure a data centre with a high level of availability. The certification also covers some of the key operations and maintenance aspects of the data centre[1].

The job tasks within data centres are described in the EPI Data Centre Competency Framework. The required competences are derived from the job tasks and are related to the exam specifications (DCCF Competence Matrix and Chapter 2 Exam Requirements.) The competencies covered in the CDCP® certification are required for individuals who wish to go further to CDCS® certification, as can be seen from the Framework in the figure above.[2].

All EPI Data Centre Management certifications have a validity period of 3 years. Technologies change very fast in the industry and in 3 years, certain technologies become obsolete while new technologies have emerged.

Context

The certificate Certified Data Centre Professional (CDCP®) is part of the EXIN data centre qualification program and has been developed in cooperation with EPI (www.epi-ap.com) EPI is the owner of the intellectual property of the course content.

The CDCP® scheme is approved by the EPI Data Centre Management Scheme Committee on 15 June 2017.

The scheme committee represents entities from the data centre market, data centre training and data centre qualification.

Target group

The examination for Certified Data Centre Professional (CDCP®) is intended for a professional who is:

- working in IT, facilities or Data Centre Operations.
- working in and around the data centre.
- responsible for achieving and improving high availability and manageability of the data centre.

[1] These tasks and focus areas have been chosen by representatives from professional practice in working data centres. They represent the most critical knowledge and competences that enable an employee to design, maintain and operate a data centre.

[2] Experts from professional practice in working data centres have selected tasks from the DCCF Competence Matrix that represent the essential tasks for Data Centre Professionals.

Specific data centre roles related to the CDCP certification[3]:

9.01 Data Centre Manager
9.06 Risk Manager
9.07 Security Manager
9.08 Business Continuity Manager
9.09 Environmental Health and Safety Manager
9.10 Sustainability Manager
9.11 Data Centre Design Manager
9.12 Solution Architect
9.13 Product Manager
9.14 Service Level Manager
9.15 Account Manager
9.16 Project Manager
9.17 Site Manager
9.18 Civil engineer/Construction engineer
9.19 Architect
9.20 Structural engineer
9.21 Electrical Engineer/ Designer
9.22 Mechanical Engineer/Designer
9.23 Fire/Safety Systems Engineer/Designer
9.24 Security Systems Engineer/Designer
9.25 Monitoring and Automation Systems Engineer/Designer
9.26 ICT Technology and Network Engineer/ Designer
9.27 Commissioning/Testing manager
9.28 Building Manager
9.29 Facilities Manager
9.30 Operation Manager
9.31 Floor manager
9.32 Data Centre Engineer
9.33 Service Desk Staff
9.34 NOC Manager

Requirements

The exam is most suitable for participants with at least two years of work experience in a data centre/facilities environment.
Due to its practice oriented nature training is mandatory.

Requirements for certification:

- Evidence of training of CDCP® by an EXIN accredited training provider, or evidence of a comparable training.
- Successful completion of the CDCP® multiple-choice exam.

Resits: If the candidate fails the exam three times, it is mandatory to do the training again.

Certification is valid for a period of three years, after which the candidate needs to recertify.

Requirements for recertification:

- A valid certificate of CDCP®. The expiry date can be found on the certificate.
- Evidence of training of CDCP® by an EXIN accredited training provider. (Contact your Training Provider for a discount on recertification training)
- Successful completion of the CDCP® exam.

Recertification is required for the highest level certificate the candidate possesses.

Practical assignment(s)

Candidates must complete practical assignments and role-playing exercises during the mandatory training by a certified trainer to show their competences as Data Centre Professionals. Factual knowledge is tested in the exam.

[3] See EPI Data Centre Competency Framework for the mission, deliverables, main tasks and required competencies in the roles and other possible requirements for the roles. These roles were chosen by representatives from professional practice.

Examination details

Examination type:	Computer-based or paper-based multiple-choice questions
Number of questions:	40
Pass mark:	68% (27 of 40)
Open book/notes:	no
Electronic equipment/aides permitted:	an (electronic) dictionary is permitted
Time allotted for examination:	60 minutes

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

Training

Any training leading to the CDCP certification must be given by certified trainers[4]. It is expected that the trainer uses a combination of lectures, question-and-answer sessions and exercises, based on the practical assignments. In addition, the trainer must ensure that the candidate fulfills all competence requirements in the practical assignments and the exam specifications in chapter 3 before giving proof of training to a candidate.

Group size

The maximum number of participants is 25.

Contact hours

The minimum number of contact hours for this training course is 14. This includes group assignments, exam preparation and short breaks. This number of hours does not include homework, logistics for exam preparation and lunch breaks.

Indication of study effort

14-20 hours, depending on existing knowledge. This does not include the hours of the mandatory training.

Training provider

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

[4] Certified trainers agree to be audited by EXIN on their methods and the value of the proof of training.

2. Exam requirements

The exam requirements are specified in the exam specifications. The following table lists the topics of the module (exam requirements), the subtopics (exam specifications), the number of questions of each subtopic in the exam and the weight given to the module.

Exam requirement	Exam specification	Number of questions	Weight
1 Facilities of the Data Centre		**34**	**85%**
	1.1 The Mission Critical Site	1	
	1.2 Data Centre Standards	1	
	1.3 Data Centre Location, Building and Construction	1	
	1.4 Raised Access Flooring and Suspended Ceiling	3	
	1.5 Light	1	
	1.6 Power Infrastructure	6	
	1.7 Electro Magnetic Fields (EMF)	2	
	1.8 Equipment Racks	1	
	1.9 Cooling Infrastructure	4	
	1.10 Water Supply	1	
	1.11 Designing a Scalable Network Infrastructure	2	
	1.12 Fire Protection	6	
	1.13 Physical Security and Safety	3	
	1.14 Auxiliary Systems	2	
2 Operations of the Data Centre		**6**	**15%**
	2.1 Operational Considerations	6	
	Total	**40**	**100%**

Exam specifications

1. Facilities of the Data Centre

1.1 The Mission Critical Site

The candidate is able to

1.1.1 provide information on the various layers in the business
1.1.2 describe the various elements of a mission critical site
1.1.3 outline the various causes and categories for downtime
1.1.4 describe a simple method of calculating the cost of downtime

1.2 Data Centre Standards

The candidate is able to

1.2.1 list the semi-standards and guidelines
1.2.2 describe at a high level the requirements of the rating levels
1.2.3 describe the relation between international and national standards

1.3 Data Centre Location, Building and Construction

The candidate is able to

1.3.1 list various site selection criteria
1.3.2 name two main hazard categories
1.3.3 describe proximity best practices
1.3.4 Name the criteria for selecting a data centre building and describe the impact of code requirements
1.3.5 list areas which are part of the data centre and their requirements and best practices
1.3.6 list classic mistakes in data centre designs

1.4 Raised Access Flooring and Suspended Ceiling

The candidate is able to

1.4.1 mention the two main types of raised floors
1.4.2 describe the main standards and general rules for raised flooring
1.4.3 mention the reasons for using suspended ceilings
1.4.4 describe the different loading factors for a raised floor
1.4.5 describe the purpose of a SRG (Signal Reference Grid) and its requirements
1.4.6 describe the sizing/dimensioning of the raised floor, computer room and suspended ceiling

1.5 Light

The candidate is able to

1.5.1 describe the definition of light
1.5.2 name the units of measure and recommended unit to use
1.5.3 list the minimum and recommended light intensity levels
1.5.4 list the requirements for the light fixtures, its connection and placement
1.5.5 list the purpose and requirements for emergency light
1.5.6 list the various types of emergency lights

1.6 Power Infrastructure

The candidate is able to

1.6.1 name the various components in a power distribution chain
1.6.2 describe various redundancy levels and techniques
1.6.3 indicate how to achieve proper power distribution within the data centre
1.6.4 explain the difference between bonding and grounding
1.6.5 describe how to apply bonding and grounding in mission critical sites
1.6.6 outline PDU standards and form factors
1.6.7 name the IP Protection grades
1.6.8 name the main electrical power and power quality units of measure, tolerances and their impact, causes and sources of power quality disturbances
1.6.9 outline the differences between the UPS technologies
1.6.10 describe various battery and battery monitoring technologies, their application/usage and pro's/con's
1.6.11 describe the thermo-graphics and their purpose

1.7 Electro Magnetic Fields (EMFs)

The candidate is able to

1.7.1 explain what an EMF is
1.7.2 mention the two main different types of EMFs and units of measurements
1.7.3 list the potential sources for an EMF
1.7.4 name the norms and best practices for EMF and their recommended values
1.7.5 explain how to reduce an EMF

1.8 Equipment Racks

The candidate is able to:

1.8.1 outline the difference between 2-post and 4-post racks
1.8.2 name the different 4-post rack types with their limitations
1.8.3 recognize the various widths and depths of racks and their usage and impact
1.8.4 name the various security measures available for racks
1.8.5 clarify the various power rail/power strip, color, casters, security and other considerations and their application

1.9 Cooling Infrastructure

The candidate is able to

1.9.1 describe the trends in heat loads and the problems they pose to mission critical sites and their equipment
1.9.2 describe the various air-conditioning types with their pro's and con's
1.9.3 explain how to cool a data centre and its equipment and the requirements for air volume displacement
1.9.4 name the various units in which cooling capacity is measured and the applicable standards and recommended values
1.9.5 explain how to convert cooling units
1.9.6 describe various techniques for high density cooling
1.9.7 mention common cooling problems
1.9.8 explain how to avoid cooling problems

1.10 Water Supply

The candidate is able to

1.10.1 explain the function of water for data centre operations
1.10.2 list the options for creating a backup water supply system and its pro's and con's

1.11 Designing a Scalable Network Infrastructure

The candidate is able to

1.11.1 explain the function of the network and planning for implementation
1.11.2 mention the various copper and fiber network technologies with their pro's and con's
1.11.3 outline the complexity of SAN networks
1.11.4 describe a method for connectivity planning
1.11.5 explain how to achieve network diversity and redundancy
1.11.6 list the various network connections
1.11.7 explain how to achieve building-to-building connectivity
1.11.8 name the installation best practices
1.11.9 mention test and verification methods
1.11.10 list the network monitoring requirements

1.12 Fire Protection

The candidate is able to

1.12.1 name the most common causes of fire
1.12.2 describe requirements for fire suppression systems
1.12.3 list standards for fire suppression and describe their content
1.12.4 mention the fire detection systems and their operating principles
1.12.5 describe the gas and non-gas based fire suppression systems available, their operating principles, and their pro's and con's
1.12.6 name the various classes of fire and correctly identify which handheld fire extinguishers to use
1.12.7 describe requirements for signage and safety and regulatory requirements

1.13 Physical Security and Safety

The candidate is able to

1.13.1 Name options for physical security
1.13.2 Describe requirements for Closed Circuit Television (CCTV) cameras
1.13.3 List the various entry control options
1.13.4 Name options for physical safety

1.14 Auxiliary Systems

The candidate is able to

1.14.1 outline the challenges and requirements for monitoring data centres
1.14.2 describe the different monitoring systems
1.14.3 describe notification options
1.14.4 describe which factors to monitor

2. Operations of the Data Centre

2.1 Operational Considerations

The candidate is able to

2.1.1 describe the function of the service catalog
2.1.2 outline the properties of Service Level Management
2.1.3 explain the data centre organizational structure
2.1.4 explain the requirements of a training program
2.1.5 identify the roles involved in data centre safety
2.1.6 describe the function of a security matrix
2.1.7 outline the minimal content for maintenance agreements
2.1.8 explain floor management activities
2.1.9 explain monitoring activities
2.1.10 list the steps of document management
2.1.11 explain vendor management activities

3. List of Basic Concepts

This chapter contains the terms 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.

- data centre
- standards
- best practices
- downtime
- data centre location
- data centre building
- data centre construction
- pitfalls
- facilities setup
- raised floor
- suspended ceiling
- applicable standards
- uniform, concentrated and rolling load definitions
- signal reference grid
- grounding of racks
- disability act and regulations
- suspended ceiling usage and requirements
- light standards
- light fixtures types and placement
- emergency light, Emergency Power Systems (EPS)
- power infrastructure
- power infrastructure layout, from generation to rack level
- Automatic Transfer Switch (ATS)
- Static Transfer Switch (STS)
- redundancy levels and techniques
- three phase usage
- single phase usage
- power distribution option
- power cabling
- bus bar trunking
- bonding
- grounding
- isolation transformers
- common mode noise
- form factors
- IP protection grades
- power quality guidelines
- real power
- apparent power
- how to size and calculate load in the data center
- generators
- static and dynamic UPS systems and criteria to use
- the correct one for application
- battery types
- thermo-graphics
- Electro Magnetic Fields (EMF's)
- sources of EMF
- electrical fields definitions
- magnetic fields definitions
- TEMPEST Standards
- (H)EMP Standards
- EMF shielding solutions
- cooling infrastructure
- cooling trends
- cooling requirements
- cooling units
- conversion rates
- sensible heat definitions
- latent heat definitions
- comfort cooling
- precision cooling
- energy efficiency
- air conditioner techniques
- high density cooling techniques
- water supply
- application areas
- backup water supply techniques
- scalable network infrastructure
- cabling hierarchy
- cable characteristics
- connectivity requirements
- network redundancy
- building-to-building connectivity
- recommended installation practices
- testing structured cabling

- verifying structured cabling infrastructure
- network monitoring system requirements
- fire suppression
- detection systems
- fire suppression techniques
- fire suppression systems,
- signage
- safety
- data center monitoring
- data center monitoring requirements
- data centre operations
- Environmental Monitoring System (EMS)
- Building Management System (BMS)
- Data Centre Infrastructure Management (DCIM)
- water leak detection systems
- notification options
- notification considerations
- operational security
- operational safety practices
- physical security controls
- physical safety controls
- documentation
- document management
- document policies
- document procedures
- facilities maintenance
- Service Level Agreement (SLA)
- Service Level Management
- Operational Level Agreement (OLA)

For further information on the concepts of CDCP® we refer to the CDCP® Course Syllabus of EPI, the course provider on www.epi-ap.com

4. Exam Literature

During the CDCP® course candidates receive a *Student Course Manual*.
For further information we refer to www.epi-ap.com.

Contact EXIN

www.exin.com

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