

# Study Guide

## **MarkLogic Professional Certification**

Taking a Written Exam

General Preparation

Developer Written Exam Guide

Administrator Written Exam Guide

Example Written Exam Questions

Hands-On Exam Overview

## Taking a Written Exam

In this section we will cover important general information about what to expect during your testing appointment, including what will happen before the exam begins, during the exam, and after the exam is completed.

- Before the Exam
  1. The exam proctor will direct you to a site where you will review the instructions for taking the exam.
  2. The exam Proctor will then validate your contact information, identity, and testing environment through the use of your web cam and government issued photo ID.
  3. Once your identity has been confirmed, the exam Proctor will provide you with an exam key which you must enter in order to begin. Exam keys are only valid for your specific testing event and will not be provided in advance. Without a valid exam key, the system will not enable you to take the exam.
  4. The final step before starting the exam is to review and accept the Terms and Conditions of the Certification Program.
- During the Exam
  1. Each exam will consist of 50 questions. Certification upgrade exams between versions of MarkLogic software may be less than 50 questions.
  2. Every exam will be different; however, the distribution of questions across categories and the weight of questions within categories will be the same for each exam attempt.
  3. You will have 60 minutes to complete the exam, starting from the time you are presented the first question.
  4. Each question may be skipped once. Skipped questions will then be presented back to you after all other questions have been answered.
  5. Do not close the browser window until your exam is complete. If you accidentally close it, please contact the exam proctor and they can help you resume the exam, as long as there is time remaining.
  6. The back button on your browser will not function during the exam. Instead you may skip questions once and answer them at the end.
  7. The exam will automatically finish when you have either submitted answers for all the questions or time expires.
- After the Exam
  1. Upon completion of the exam, your results will be saved in the system, displayed on your screen, and sent to the email address provided when you entered your contact information.

2. To pass the exam you must answer at least 37 out of 50 questions correctly.
3. You will be provided a breakdown of your score overall and by category. You will not be shown the exact questions that you answered correctly or incorrectly.
4. If successful in passing the exam, the next step is to enroll in a hands-on testing event.
5. If unsuccessful in passing the exam, you may retry by enrolling in another written exam testing event.

## General Preparation:

To prepare for the MarkLogic Professional Certification program it is recommended that you have attended formal MarkLogic University training, performed your own research and self-study, and obtained real world professional experience using MarkLogic.

Resources that are available to you include:

- Free MarkLogic University Instructor led, self-paced and On Demand training:
  - <https://www.marklogic.com/learn/university/>
  
- Learning Assessment tests:
  - <https://mlu.marklogic.com/assessments/>
  
- Developer Community resources, blogs and tutorials:
  - <http://developer.marklogic.com>
  
- Inside MarkLogic Server whitepaper:
  - <http://developer.marklogic.com/inside-marklogic>
  
- Performance: Understanding System Resources:
  - <http://developer.marklogic.com/learn/understanding-system-resources>
  
- Documentation:
  - <http://docs.marklogic.com>

## Developer Written Exam Details

In this section you will learn more about the MarkLogic Certified Developer written exam. You will learn about the category breakdown and some example topics within each category to help focus your studies.

Category	Key Topics
Architecture	<ul style="list-style-type: none"> <li>• General understanding of key MarkLogic architecture components including:               <ul style="list-style-type: none"> <li>○ Databases</li> <li>○ Forests</li> <li>○ Application servers</li> <li>○ Hosts (E node / D node concepts)</li> <li>○ Groups</li> <li>○ Caches</li> <li>○ Clusters</li> </ul> </li> <li>• Merges</li> <li>• Rebalancing</li> <li>• Scalability</li> </ul>
XPath & FLWOR <i>(XQuery exam only)</i>	<ul style="list-style-type: none"> <li>• XPath expressions, predicates, and axes</li> <li>• FLWOR expression logic</li> <li>• XQuery programming structure and syntax</li> </ul>
Using the Node.js API <i>(Node.js exam only)</i>	<ul style="list-style-type: none"> <li>• Database clients</li> <li>• Document Descriptors</li> <li>• Callbacks, promises and streams</li> <li>• Performing CRUD operations</li> </ul>
Using the Java API <i>(Java exam only)</i>	<ul style="list-style-type: none"> <li>• Database clients</li> <li>• Document Managers</li> <li>• Handles</li> </ul>

	<ul style="list-style-type: none"> <li>• Performing CRUD operations</li> </ul>
Indexing	<ul style="list-style-type: none"> <li>• Element and attribute range indexes</li> <li>• String range indexes and collation</li> <li>• Term List indexes</li> <li>• Reverse index</li> <li>• Tokenization and stemming concepts</li> <li>• Working with data across multiple languages and its impact on indexes</li> <li>• Reindexing</li> </ul>
Search	<ul style="list-style-type: none"> <li>• Search relevancy, query weighting, document weighting</li> <li>• Filtered versus Unfiltered search</li> <li>• Using query constructors</li> <li>• Query tuning functions such as <b>plan()</b></li> <li>• Search across multiple languages</li> </ul>
Template Driven Extraction	<ul style="list-style-type: none"> <li>• Creating and using templates</li> </ul>
Optic API	<ul style="list-style-type: none"> <li>• Creating Optic plans</li> <li>• Selects</li> <li>• Joins</li> </ul>
SQL	<ul style="list-style-type: none"> <li>• SQL configuration</li> <li>• SQL queries in MarkLogic</li> </ul>
Data Modeling	<ul style="list-style-type: none"> <li>• Using mlcp to ingest and transform documents</li> <li>• Loading and managing data using the Client REST API</li> <li>• Managing binary documents</li> <li>• Using fields</li> <li>• Data modeling choices and the impact on indexes and query resolution</li> </ul>

	<ul style="list-style-type: none"> <li>• Denormalization</li> <li>• The envelope pattern</li> </ul>
Transactions	<ul style="list-style-type: none"> <li>• MVCC</li> <li>• Single statement transactions</li> <li>• Multi statement transactions</li> <li>• Distributed transactions</li> <li>• Point in time queries versus queries that require locks</li> <li>• Using server side functions like <code>invoke()</code>, <code>eval()</code>, and <code>spawn()</code></li> </ul>
Security	<ul style="list-style-type: none"> <li>• Roles and users</li> <li>• Application server security</li> <li>• Permissions</li> <li>• Privileges</li> <li>• Managing security on code in a modules database</li> <li>• Amps</li> <li>• Redaction</li> <li>• Element-level security</li> </ul>
Semantics	<ul style="list-style-type: none"> <li>• Loading and managing RDF data with <code>mlcp</code></li> <li>• Data modeling of triples in MarkLogic</li> <li>• SPARQL query language</li> <li>• Named graphs and collections</li> <li>• Using the <b>sem</b> functions</li> <li>• Using the <b>cts</b> semantics functions</li> </ul>

## Administrator Written Exam Details

In this section you will learn more about the MarkLogic Certified Administrator written exam. You will learn about the category breakdown and some example topics within each category to help focus your studies.

Category	Key Topics
Installation and Configuration	<ul style="list-style-type: none"> <li>• System requirements</li> <li>• Installation steps</li> <li>• Licensing</li> <li>• Cluster deployment</li> <li>• Ports</li> <li>• Groups</li> <li>• Admin Interface</li> <li>• REST API</li> <li>• ml-gradle</li> <li>• Documentation</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>• Log Files</li> <li>• Dashboards</li> <li>• Management API</li> <li>• Meters</li> </ul>
Databases	<ul style="list-style-type: none"> <li>• Creation techniques</li> <li>• Forests</li> <li>• Sizing</li> <li>• Storage</li> <li>• Ports</li> </ul>
Roles and Users	<ul style="list-style-type: none"> <li>• Creating roles</li> <li>• Role inheritance</li> </ul>



	<ul style="list-style-type: none"> <li>• Privileges</li> <li>• Creating users</li> </ul>
Data Loading	<ul style="list-style-type: none"> <li>• Data modeling</li> <li>• APIs for loading</li> <li>• URIs, directories, and collections</li> <li>• Document permissions</li> <li>• MIME types</li> <li>• CPF</li> </ul>
Updates, Merges, and Transactions	<ul style="list-style-type: none"> <li>• Modifying documents</li> <li>• Batch updates</li> <li>• CoRB</li> <li>• Data Movement SDK</li> <li>• Stands and merging</li> <li>• Transactions</li> <li>• Locking</li> </ul>
Search	<ul style="list-style-type: none"> <li>• APIs</li> <li>• Stemming</li> <li>• Triples</li> <li>• SQL</li> <li>• Optic API</li> </ul>
Serving Data	<ul style="list-style-type: none"> <li>• App servers</li> <li>• Modules</li> <li>• REST</li> <li>• Data service</li> <li>• Automating deployment</li> </ul>

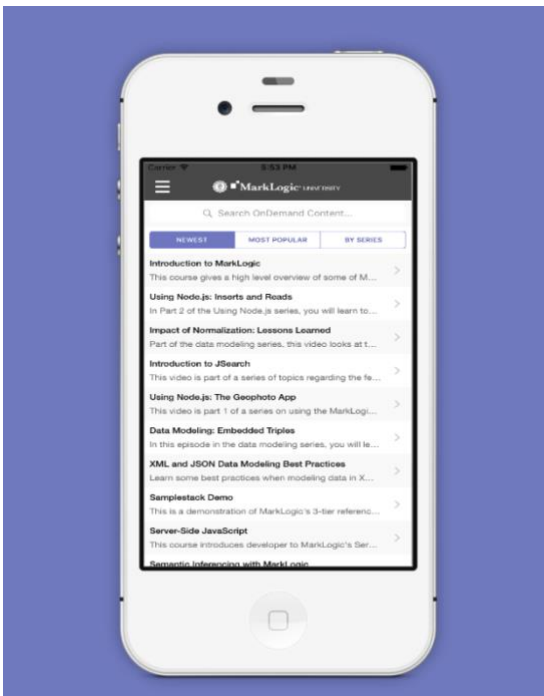
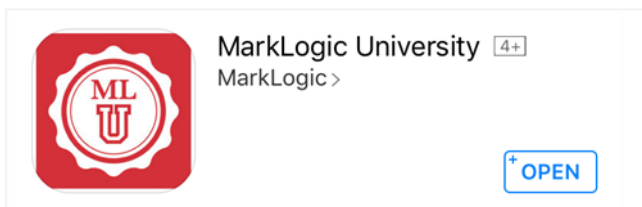
Indexes	<ul style="list-style-type: none"> <li>• Understanding uses</li> <li>• Types of indexes</li> <li>• Optional indexes</li> <li>• Range indexes</li> <li>• Sizing</li> </ul>
Security	<ul style="list-style-type: none"> <li>• Roles, users, and privileges</li> <li>• Security database</li> <li>• Encryption at Rest</li> <li>• SSL for hosts</li> <li>• Element-level security</li> <li>• Redaction</li> <li>• Granular privileges</li> <li>• Auditing</li> </ul>
Resizing	<ul style="list-style-type: none"> <li>• Forest sizing</li> <li>• Adding forests</li> <li>• Rebalancing</li> <li>• Retiring forests</li> <li>• Removing a host</li> </ul>
Backups	<ul style="list-style-type: none"> <li>• Location</li> <li>• Doing a backup</li> <li>• Scheduling backups</li> <li>• Incremental backups</li> <li>• Restoring</li> <li>• Point-in-time restore</li> </ul>
High Availability	<ul style="list-style-type: none"> <li>• Forest replication</li> </ul>

	<ul style="list-style-type: none"> <li>• Failover hosts</li> <li>• Database replication</li> <li>• Flexible replication</li> </ul>
Tiered Storage	<ul style="list-style-type: none"> <li>• Purpose</li> <li>• Assignment policy</li> <li>• Range partitions</li> <li>• Query partitions</li> </ul>
Performance	<ul style="list-style-type: none"> <li>• Common factors</li> <li>• Unfiltered vs. filtered search</li> <li>• Cache hits and misses</li> <li>• Sorting</li> <li>• MLCP -fastload</li> </ul>
Upgrading	<ul style="list-style-type: none"> <li>• Single host</li> <li>• Rolling upgrade</li> <li>• Best practices</li> </ul>
Support	<ul style="list-style-type: none"> <li>• Contact</li> <li>• Handbook</li> <li>• Telemetry</li> <li>• Dump file</li> </ul>

## Accessing Example Questions:

To better understand the format and structure of questions on the written certification exam you should begin preparing by:

1. Taking and passing the Learning Assessments for the courses in your learning track:
  - a. <https://mlu.marklogic.com/assessments/>
2. Downloading the MarkLogic University mobile app for iOS or Android to watch video tutorials and take a certification prep quiz:



## Hands-On Exam Overview

After successful completion of the written exam you will be eligible to take the hands-on exam.

The hands-on exam is deliverable-based. You will access a hosted virtual machine which will have all the necessary software, data, and instructions required to complete the hands-on exam. You will have up to 4 hours to complete the deliverables according to the requirements defined in the instructions.

The exam proctor will provide you details on how to access the virtual machine and the instructions during your hands-on testing session. All your deliverables will be saved to the virtual machine. MarkLogic representatives will evaluate your submissions and provide your results within two (2) weeks of completing the hands-on exam.

Deliverables for the developer exams include writing optimized, scalable code to:

- Perform data loads.
- Perform database transactions.
- Perform searches.
- Perform SPARQL queries.
- Perform Optic API queries.
- Perform query analysis and tuning.
- Implementing redaction rules.

Deliverables for the administrator exam includes:

- Creating a cluster
- Defining a database, forests, and REST API instance
- Creating roles and users
- Loading documents
- Defining indexes
- Deploying a data service
- Backing up a database
- Retiring and un-attaching forests
- Creating forest replicas
- Enabling telemetry
- Creating granular privileges