MarkLogic Server

Release Notes

MarkLogic 7
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1.0 Introduction

MarkLogic 7 is a major release of MarkLogic Server that includes many new features. The new features are described in “New Features in MarkLogic 7” on page 11. The following lists some of the major features with links to where they are described:

- Database Rebalancing and Elasticity
- Tiered Storage
- SPARQL and Semantics Support
- Expanded Amazon EC2 Cloud Integration

For a list of all of the new features, see “New Features in MarkLogic 7” on page 11.

If you are upgrading from 6.0, some applications will require minor changes to run correctly on MarkLogic 7. For details, see “Known Incompatibilities with Previous Releases” on page 23.

For a list of bugs fixed in the latest maintenance release and a list of known bugs, see the MarkLogic Technical Support website at http://support.marklogic.com (supported customers only).

2.0 Installation and Upgrade

This chapter describes the supported platforms and upgrade paths for MarkLogic Server, and has the following sections:

- Supported Platforms
- Certified Filesystems
- Upgrade Support

2.1 Supported Platforms

MarkLogic Server is supported on the following platforms:

- Microsoft Windows Server 2008 (x64), Windows 7 and 8 64-bit (x64)*
- Sun Solaris 10 (x64)
- Red Hat Enterprise Linux 5 (x64)** *** ****
- Red Hat Enterprise Linux 6 (x64)** *** ****
- SUSE Linux Enterprise Server 11 (x64)** ***
- CentOS 5 (x64)** ***
- CentOS 6 (x64)** ***
- Amazon Linux 2013.03 (x64)** ***
- Mac OS X 10.6 or 10.7 or 10.8*****

* Microsoft Windows 7 and Windows 8 are supported for development only.
If MarkLogic Server fails to start up on Windows with the error "the application failed to initialize properly (0xc0150002)", then a dependency is missing from your environment and you need to download and install the following DLL for 64-bit versions of Windows: http://www.microsoft.com/downloads/details.aspx?FamilyID=eb4ebe2d-33c0-4a47-9dd4-b9a6d7bd44da&DisplayLang=en. Additionally, if you get an error on startup saying you need MSVCR100.dll, the install the Microsoft Visual C++ 2010 SP1 Redistributable Package (x64) http://www.microsoft.com/en-us/download/details.aspx?id=13523.

** The deadline I/O scheduler is required on Red Hat Linux platforms. The deadline scheduler is optimized to ensure efficient disk I/O for multi-threaded processes, and MarkLogic Server can have many simultaneous threads. For information on the deadline scheduler, see the Red Hat documentation (for example, http://www.redhat.com/magazine/008jun05/features/schedulers/).

***The `redhat-lsb`, `glibc`, and `gdb` packages are required on Red Hat Linux. Additionally, on 64-bit Red Hat Linux, both the 32-bit and the 64-bit `glibc` packages are required.

****Red Hat Linux 5 and 6 (x64) are also supported in a VMWare ESXi 5.0 (installed on bare metal) environment.

*****Mac OS X is supported for development only. Conversion (Office and PDF) and entity enrichment are not available on Mac OS X. Mac OS X 10.6, 10.7, or 10.8 (Snow Leopard, Lion, or Mountain Lion) on a 64-bit capable processor is required (http://support.apple.com/kb/HT3696).

2.2 Certified Filesystems

MarkLogic relies on the operating system for filesystem operations. While any filesystem that works properly (including under heavy load) should work, the following table lists the operating systems along with the filesystems under which they are certified. Other filesystems may work but have not been thoroughly tested by MarkLogic.

Operating System	Certified Filesystems
Linux (all varieties)	EXT3, EXT4, as well as the clustered filesystems for shared-disk failover mentioned in Requirements for Shared-Disk Failover in the *Scalability, Availability, and Failover Guide*. **Warning** Do not use `data=writeback` with EXT3 and EXT4 filesystems. NAS is certified on Red Hat 6 and NetAPP.
Sun Solaris	UFS, as well as the clustered filesystems for shared-disk failover mentioned in Requirements for Shared-Disk Failover in the *Scalability, Availability, and Failover Guide*.
Windows	NTFS
Mac OS	HFS+
All	Hadoop HDFS, Amazon S3 (no journaling with S3)

2.3 Upgrade Support

This section describes upgrade support to MarkLogic 7. For details on installing MarkLogic Server and for the upgrade procedure, see the *Installation Guide*.

Upgrading is supported from 4.2-1 or later. If you are running a release prior to 4.2, you must first upgrade to 4.2, 5.0, or MarLogic 6 before upgrading to MarkLogic 7. If you are upgrading a cluster, you must first upgrade the node in which the Security database forest is located before you upgrade other nodes in the cluster. MarkLogic Corporation strongly recommends performing a backup of your databases before upgrading to MarkLogic 7. Additionally, MarkLogic Corporation recommends that you first upgrade to the latest maintenance release of 4.2, 5.0, or MarkLogic 6 before upgrading to MarkLogic 7.

An upgrade from 4.2 or 5.0 to MarkLogic 7 will reindex any databases that have `reindex enable` set to `true`. Upgrading from MarkLogic 6 does not require a reindex. If you choose not to reindex your databases, they will run in either 4.2 or 5.0 compatibility mode, depending on the version of MarkLogic Server in which they were last loaded or reindexed. Running in compatibility mode will disable certain MarkLogic 7 features and may treat all content in the database as English language content. For details on database compatibility, see the *Installation Guide*.

MarkLogic 7 includes a new rebalancing feature with a more efficient document placement algorithm. Upon upgrade, databases from previous MarkLogic releases are set to use the `legacy` document assignment policy, which is the same as used in previous MarkLogic releases. If you do plan on reindexing an upgraded database, MarkLogic recommends that you consider setting your databases to use the new `bucket` document assignment policy. The `bucket` policy is more efficient for rebalancing your database across forests if you add or remove forests from your configuration. For more details, see Database Rebalancing in the *Administrator's Guide*.

There are some known incompatibilities between MarkLogic 7 and MarkLogic 6. You might need to make some minor code changes to your MarkLogic 6 applications before they can run correctly in MarkLogic 7. For details on the incompatibilities, see "Known Incompatibilities with Previous Releases" on page 23. For instructions on upgrading to MarkLogic 7, including information about database compatibility between MarkLogic 7 and MarkLogic 6, see the *Installation Guide*.

3.0 New Features in MarkLogic 7

This chapter describes the new features in MarkLogic 7.

- New Features in MarkLogic 7.0-1
- New Features in MarkLogic 7.0-2
- New Features in MarkLogic 7.0-3
- New Features in MarkLogic 7.0-4

3.1 New Features in MarkLogic 7.0-1

MarkLogic 7.0-1 introduced the following new features:

- Database Rebalancing and Elasticity
- Tiered Storage
- SPARQL and Semantics Support
- Expanded Amazon EC2 Cloud Integration
- Forest Storage on HDFS and S3
- Decreased Storage Requirements
- Cluster Status and History Dashboard, Meters Database, and APIs
- Configuration Manager Enhancements
- Deployment Enhancements and Greatly Expanded REST API
- MLCP Enhancements
- Search In SQL With SQL MATCH Operator
- XCC Load Balancing
- External Authentication with LDAP and Kerberos
- Search Features and Enhancements
- Client REST API Enhancements
- Java API Enhancements
- Query Console Enhancements

3.1.1 Database Rebalancing and Elasticity

MarkLogic 7 includes features that make it very easy to grow and shrink a cluster and keep the data balanced between the different hosts. This allows you to easily grow your system quickly for increased capacity. It also makes it easy to shrink the system, moving data from one host onto another. For details, see Database Rebalancing in the *Administrator's Guide*.

3.1.2 Tiered Storage

MarkLogic 7 adds support for Tiered Storage, which allows you to partition your data by a key (typically a date) and store different sets of data in different tiers of storage. For example, you can have operational data (say the last year of data) stored on fast local disk, older data on less expensive (and usually slower) disk, and archive data on much less expensive disk (such as HDFS or S3). Additionally, you can set up super-databases to query across databases that comprise different tiers of data. For details, see Tiered Storage in the *Administrator's Guide*.

3.1.3 SPARQL and Semantics Support

MarkLogic 7 introduces support for semantic queries, including support for all of the capabilities in SPARQL 1.0 and many of the capabilities in SPARQL 1.1. MarkLogic includes rich support for triples, and integrates querying triples with MarkLogic search in ways that allow you to not only create interesting semantic applications, but to integrate them with search in a rich way. For details, see the *Semantics Developer's Guide*.

3.1.4 Expanded Amazon EC2 Cloud Integration

MarkLogic 7 includes a rich integration with Amazon EC2. EC2 provides a convenient and high-performance environment for creating MarkLogic clusters, making it easy to add capacity to a cluster by adding more resources, without the need to manage the hardware. MarkLogic has developed CloudFormation templates to make the whole process easier. For details, see the *MarkLogic Server on Amazon EC2 Guide*.

3.1.5 Forest Storage on HDFS and S3

MarkLogic 7 allows you to store forest data on HDFS (Hadoop Distributed Filesystem) and Amazon S3 (Simple Storage Service). Both HDFS and S3 are distributed filesystems and are often a good source of low-priced storage. HDFS and S3 can also make sense as part of a Tiered Storage strategy. For details, see HDFS and S3 Storage on Forests in the *Query Performance and Tuning Guide*.

3.1.6 Decreased Storage Requirements

MarkLogic 7 has decreased the amount of storage needed by lowering the amount of disk space required to 1.5 times the forest size when you use the new (and recommended) default `max-merge-size` of 32 GB. Additionally, the 32 GB setting will eliminate very large merges. For details, see Memory, Disk Space, and Swap Space Requirements in the *Installation Guide*.

3.1.7 Cluster Status and History Dashboard, Meters Database, and APIs

To complement the Monitoring Dashboard that runs on port 8002, MarkLogic 7 includes a Monitoring History dashboard. MarkLogic stores cluster history information in a database and the Monitoring History dashboard allows you to look through that historical data and see graphs of disk usage over time, CPU usage over time, App Server traffic over time, and so on. The Monitoring History dashboard can help you to easily get a detailed look at your cluster activity over time. For details, see MarkLogic Server Monitoring History in the *Monitoring MarkLogic Guide*.

3.1.8 Configuration Manager Enhancements

MarkLogic 7 includes significant enhancements to the Configuration Manager. The Configuration Manager makes it easy to view your configuration, as well as package up a configuration to reuse in another environment. For details on the configuration manager, see Using the Configuration Manager in the *Administrator's Guide*.

3.1.9 Deployment Enhancements and Greatly Expanded REST API

MarkLogic 7 includes REST Management APIs that allow you to script installation, configuration, and deployment for virtually all aspects of a MarkLogic cluster. These REST APIs give detailed information and allow many changes to the configuration for a cluster. For details on scripting, see the *Scripting Administrative Tasks Guide*. For details on the management REST API, see the online REST API documentation and *Monitoring MarkLogic Guide*.

3.1.10 MLCP Enhancements

MarkLogic 7 includes the following enhancements for mlcp, a tool for loading documents into MarkLogic. For details on mlcp, see Using MarkLogic Content Pump in the *Loading Content Into MarkLogic Server Guide*.

- Enhanced support for loading delimited text files. For details, see the options `-delimited_root_name`, `-generate_uri`, and Creating Documents from Delimited Text Files in *Loading Content Into MarkLogic Server Guide*.
- Support for loading RDF triples using `-input_file_type rdf`. For details, see *Semantics Developer's Guide* and Loading Triples in *Loading Content Into MarkLogic Server Guide*.
- Choose to export documents from the database using a consistent point-in-time snapshot during export and copy operations. For details, see the `-snapshot` option and Extracting a Consistent Database Snapshot in *Loading Content Into MarkLogic Server Guide*.
- Apply server-side XQuery content transformations during import and copy operations. For details, see the `-transform_*` options and Transforming Content During Ingestion in *Loading Content Into MarkLogic Server Guide*.
- Support for tiered storage during import and copy operations. For details, see the `-output_partition option`.
- Added more options for tuning performance. For details, see the `-thread_count_per_split` and `-split_input options` and Performance Considerations for Loading Documents in *Loading Content Into MarkLogic Server Guide*.
- Support for specifying content encoding during export. For details, see the `-content_encoding` option.
- Filter which files are exported or copied based on an XPath expression. For details, see the `-document_selector` option and Controlling What is Exported, Copied, or Extracted in *Loading Content Into MarkLogic Server Guide*.

3.1.11 Search In SQL With SQL MATCH Operator

The `SQL MATCH` operator in the MarkLogic SQL implementation now allows you to specify complex searches in your SQL queries, with search operators similar to the Search API. For details, see MATCH Operator in the *SQL Data Modeling Guide*.

3.1.12 XCC Load Balancing

In MarkLogic 7, you can now run XCC applications against a Layer 3 HTTP load balancer. In previous releases, XCC did not support being run against a load balancer. To use XCC applications with an HTTP load balancer, set `xcc.httpcompliant` to true in your XCC application and use the `SessionId` cookie to preserve session affinity.

For details, see Using a Load Balancer or Proxy Server with an XCC Application in *XCC Developer's Guide*.

3.1.13 External Authentication with LDAP and Kerberos

You can now set up an external server for authentication to use with MarkLogic Server. You can optionally, in the case of LDAP, use the external server for authorization as well. For details, see External Authentication (LDAP and Kerberos) in the *Understanding and Using Security Guide*.

3.1.14 Search Features and Enhancements

MarkLogic 7 includes many new and improved search features, including the following:

- Path Fields
- Range Index Search Scoring
- Custom Search Tokenization
- Search Super-Weighting
- Expanded xdmp:plan Output
- Expanded Mild NOT Support
- Standalone Structured Queries
- Boost Relevance Scores with a Secondary Query
- More Search API Features
- REST API Search Enhancements
- Wildcard Enhancements

3.1.14.1 Path Fields

You can now create fields based on path expressions, and you can create range indexes on those fields. A path field gives you more control over what data can go into a field. For example, you can have a path field defined for `/a/b//c`, and that will include all c elements that have a root of `/a/b` in their documents. Additionally, the Admin Interface page to create fields has been changed to make it easier to configure fields. For details on path fields, see Fields Database Settings in the *Administrator's Guide*.

3.1.14.2 Range Index Search Scoring

In previous versions of MarkLogic, range queries (for example, `cts:element-range-query`) did not contribute to the relevance score of a search. In MarkLogic 7, all range queries do contribute t score. This allows you to do things like have searches that include dates (for example, in an element) rank newer dates higher than older dates (or if you prefer, have older dates rank higher than newer dates). For details, see Relevance Scores: Understanding and Customizing in the *Search Developer's Guide*.

3.1.14.3 Custom Search Tokenization

MarkLogic 7 includes the ability to define custom tokenization rules for a given field. Custom tokenization rules allow you to change, for the given field, how some characters are tokenized. This can allow more accurate searches and wildcard searches for things like social security numbers or other sets of text that mix word, spaces, and punctuation. For details, see Custom Tokenization in the *Search Developer's Guide*.

3.1.14.4 Search Super-Weighting

MarkLogic 7 allows you to specify positive search query weights beyond 16 for query weights (for example, the `$weight` parameter on `cts:query` constructors such as `cts:word-query`). The weights can now go up to 64, and scores greater than 16 will get greater weight than in previous releases.

3.1.14.5 Expanded xdmp:plan Output

The `xdmp:plan` output includes much more information than in previous releases, allowing you to better understand how a search evaluates.

3.1.14.6 Expanded Mild NOT Support

The string query grammar now includes a `NOT_IN` operator that corresponds to `cts:not-in-query`. For details, see Searching Using String Queries in *Search Developer's Guide*.

3.1.14.7 Standalone Structured Queries

The structured query schema now supports creation of "standalone" range, word, value, geospatial, and container queries that encapsulate constraints within the query rather than requiring you to pre-define constraints in query options. For details, see range-query, value-query, word-query, geo-elem-query, geo-elem-pair-query, geo-attr-pair-query, geo-path-query, and container-query in *Search Developer's Guide*.

3.1.14.8 Boost Relevance Scores with a Secondary Query

You can use `cts:boost-query` to construct a query that boosts the relevance score of results that also match a secondary query. For details, see `cts:boost-query` and Boost Relevance Scores with a Secondary Query in *Search Developer's Guide*.

This feature is also supported in structured queries. For details, see boost-query in *Search Developer's Guide*.

3.1.14.9 More Search API Features

The Search API has been updated to take advantage of the new search features.

3.1.14.10REST API Search Enhancements

Search related enhancements to the MarkLogic REST API include the following. For the complete list of enhancements, see “Client REST API Enhancements” on page 17.

- Query By Example (QBE), a new query language that models your document structure.
- Rule-Based Matching.
- Enhancement of search results with href and mimetype data useful for constructing links to matching documents.
- Support for search term completion suggestion generation.

3.1.14.11Wildcard Enhancements

MarkLogic 7 allows you greater control over wildcard queries that use lexicon expansion. The word query constructors (for example, `cts:word-query`) now take a `lexicon-expand` option that allows you to control when a query uses the lexicon for wildcard expansion. For details, see the API documentation for `cts:word-query` and the other `cts:query` constructors.

3.1.15 Client REST API Enhancements

The MarkLogic Server Welcome page on port 8000 now includes a new interface for interactively creating a REST API instance.

MarkLogic 7 includes the following enhancements to the REST Client API:

Feature	Description
Partial Updates	Update portions of metadata and content, in addition to entire documents. For details, see Partially Updating Document Content or Metadata in *REST Application Developer’s Guide* and the API reference for `POST /v1/documents`.
Automatic Document URI Generation	Insert documents into the database with server-generated URIs. For details, see Automatically Generating Document URIs in *REST Application Developer’s Guide* and the API reference for `POST /v1/documents`.
Query By Example	Perform queries using a syntax that close models the structure of your documents. For details, see Using Query By Example to Prototype a Query in *REST Application Developer’s Guide* and the API reference for the `/v1/qbe` service.
N-Way Co-occurrences	The `/v1/values` service now supports N-way co-occurrences instead of only 2-way co-occurrences. For details, see the API reference for the `/v1/values` service.

Feature	Description
Query Result Transformation	Apply customquery result transformations to results from `/search`, `/qbe`, and `/values`. For details, see Transforming the Search Response in *REST Application Developer's Guide*.
Document Links in Search Results	Search results now include an `href` attribute (or JSON key) with which you can retrieve matching documents using the REST API. The reference is of the form `/version/documents?uri=matching-document-uri`.
Search Suggestions	Fetch search term completion suggestions as users enter query text. For details, see Generating Search Term Completion Suggestions in *REST Application Developer's Guide* and the API reference for the `/v1/suggest` service.
Semantic Search	Load and query semantic data. For details, see *Semantics Developer's Guide* and the API reference for the `/v1/graphs` services.
Modules Database Interface	Add, update, and remove assets stored in the modules database associated with a REST instance, such as REST resource extension dependencies and custom search snippeting XQuery modules. For details, see Managing Dependent Libraries and Other Assets and the API reference for the `/v1/ext` services.
Client-side Alerting	Detect the existence of documents matching preferences that are saved as rules. For details, see Alerting in *REST Application Developer's Guide* and the API reference for the `/v1/alert` services.
Load Balancer Session Affinity Support	Load Balancer Session Affinity Support: The HostId cookie can be used to provide session affinity for REST applications that use multi-statement transactions and communicate with MarkLogic Server through a load balancer. For details, see Managing Transactions When Using a Load Balancer in *REST Application Developer's Guide*.

3.1.16 Java API Enhancements

The MarkLogic Server Welcome page on port 8000 now includes a new interface for interactively creating a REST API instance.

MarkLogic 7 includes the following enhancements to the REST Client API:

Feature	Description
Partial Updates	Update portions of metadata and content, in addition to entire documents. For details, see Partially Updating Document Content and Metadata in *Java Application Developer's Guide*.
Automatic Document URI Generation	Insert documents into the database with server-generated URIs. For details, see Automatically Generating Document URIs in *Java Application Developer's Guide*.
Query By Example	Perform queries using a syntax that close models the structure of your documents. For details, see Prototype a Query Using Query By Example in *Java Application Developer's Guide*.
N-Way Co-occurrences	The Java API now supports N-way co-occurrences instead of only 2-way co-occurrences.
Query Result Transformation	Apply customquery result transformations to query results. For details, Transforming Search Results in *Java Application Developer's Guide*.
Search Suggestions	Fetch search term completion suggestions as users enter query text. For details, see Generating Search Term Completion Suggestions in *Java Application Developer's Guide*.
Modules Database Interface	Add, update, and remove assets stored in the modules database associated with a REST instance, such as REST resource extension dependencies and custom search snippeting XQuery modules. For details, see Managing Dependent Libraries and Other Assets in *Java Application Developer's Guide*.
Client-side Alerting	Detect the existence of documents matching preferences that are saved as rules. For details, see Alerting in *Java Application Developer's Guide*.
Load Balancer Session Affinity Support	Load Balancer Session Affinity Support: The `HostId` cookie can be used to provide session affinity for applications that use multi-statement transactions and communicate with MarkLogic Server through a load balancer. For details, see Transaction Management When Using a Load Balancer in *Java Application Developer's Guide*.

3.1.17 Query Console Enhancements

The following enhancements are added to Query Console:

- Support for native SQL and SPARQL queries

- Automatic formatting of query results based on result type, with the ability to select alternative formats on a per-item basis.
- You can drag the Run bar to arbitrarily resize the editor and results panels.
- You can cancel a running query.

3.2 New Features in MarkLogic 7.0-2

MarkLogic 7.0-2 introduced the following new features:

- Direct Access to Forest Contents with mlcp and the Hadoop Connector for MarkLogic
- Filter Search Suggestions Using Combined Query
- Advanced Language Support for Norwegian (Nynorsk and Bokmål)

3.2.1 Direct Access to Forest Contents with mlcp and the Hadoop Connector for MarkLogic

Direct Access enables you to bypass MarkLogic Server to access documents by reading them directly from the on-disk representation of a forest. Direct Access is primarily intended for accessing archived data that is part of a tiered storage deployment. Direct Access is available through the following interfaces:

- Use the `mlcp extract` command to extract documents from a forest as files on the native filesystem or HDFS using the new `extract` command.
- Use `mlcp import -input_file_type forest` to copy documents from a forest to another database.
- Use `ForestInputFormat` from the Hadoop Connector for MarkLogic to use a forest as an input source for a MapReduce job.

For details, see Using Direct Access to Extract or Copy Documents in the *Loading Content Into MarkLogic Server Guide* and Direct Access Using ForestInputFormat in the *MarkLogic Connector for Hadoop Developer's Guide*.

3.2.2 Filter Search Suggestions Using Combined Query

The new `POST /v1/suggest` method enables you to filter search term completion suggestions using a combined query in addition to string queries. Using a combined query enables you to include dynamic query options in your request and to express your filtering query using the full power of a structured query.

For details, see POST /v1/suggest in the *MarkLogic REST API Reference* and Generating Search Term Completion Suggestions in the *REST Application Developer's Guide*.

3.2.3 Advanced Language Support for Norwegian (Nynorsk and Bokmål)

MarkLogic 7.0-2 introduces Norwegian language support for the Nynorsk (nn) and Bokmål (nb) languages. Support for unspecified Norwegian language (no) is available through generic language support. For more information, including supported collations, see Collations and Character Sets By Language in the *Search Developer's Guide*.

3.3 New Features in MarkLogic 7.0-3

MarkLogic 7.0-3 introduced the following new features:

- Advanced Language Suppport for Swedish
- Client REST API: Multi-Document Read and Write Support

3.3.1 Advanced Language Suppport for Swedish

MarkLogic 7.0-3 introduces Swedish language support for the Swedish language. For more information, including supported collations, see Collations and Character Sets By Language in the *Search Developer's Guide*.

3.3.2 Client REST API: Multi-Document Read and Write Support

The MarkLogic REST API now support reading and writing multiple document with a single request through the following interfaces. For details, see Reading and Writing Multiple Documents in the *REST Application Developer's Guide*.

Multi-document write operations are supported by the following interface:

```
POST /v1/documents
```

Multi-document read operations are supported by the following interfaces. Use `/documents` to retrieve documents by URI. Use `/search` or `/qbe` to retrieve documents matching a query.

```
GET /v1/documents
GET /v1/search
POST /v1/search
GET /v1/qbe
POST /v1/qbe
```

3.4 New Features in MarkLogic 7.0-4

MarkLogic 7.0-4 introduced the following new features:

- Java and REST Client APIs: Improved Control Over Extension HTTP Response

3.4.1 Java and REST Client APIs: Improved Control Over Extension HTTP Response

The following new capabilities are available to authors of resource service extensions usable with the REST or the Java Client API.

You can set additional output HTTP headers in your resource service extension implementation using the new `output-headers` key of the `$context-map` parameter. For details, see Setting Additional Response Headers in the *REST Application Developer's Guide*.

You can set the HTTP response status code in your resource service extension implementation using the new `output-status` key of the `$context-map` parameter. For details, see Setting the Response Status Code *REST Application Developer's Guide*.

4.0 Known Incompatibilities with Previous Releases

The vast majority of applications implemented on MarkLogic Server 6.0-* will run either without modifications or with very minor modifications in MarkLogic 7. There are, however, a number of changes that will cause compatibility issues with applications developed using previous releases. This section describes those incompatibilities and includes the following topics:

- Incompatibilities Between MarkLogic 7.0-4 and 7.0-3
- Incompatibilities Between MarkLogic 7.0-3 and 7.0-2
- Incompatibilities Between MarkLogic 7.0-2 and 7.0-1
- Incompatibilities Between MarkLogic 7.0-1 and MarkLogic 6
- Incompatibilities Between MarkLogic 6 and 5.0
- Incompatibilities Between 4.2 and 5.0

4.1 Incompatibilities Between MarkLogic 7.0-4 and 7.0-3

This section describes the incompatibilities between MarkLogic 7.0-4 and 7.0-3.

- Java and REST Client API: JSON Documents Cannot Be Retrieved as XML
- Java and REST Client API: Document Content Type Based on URI Extension

4.1.1 Java and REST Client API: JSON Documents Cannot Be Retrieved as XML

In prior releases, you could read the internal XML representation of a JSON document. This was primarily a debugging feature and has been removed. As of 7.0-4, you can only read JSON documents as JSON.

If you need to view the internal XML representation of a JSON document, use the XQuery function `fn:doc` or the Query Console Explore feature. For example, you can examine the XML representation of a JSON document by running the a query similar to the following in Query Console:

```
xquery version "1.0-ml";
fn:doc("your-doc-uri-here")
```

4.1.2 Java and REST Client API: Document Content Type Based on URI Extension

The following change potentially affects applications that use the REST or Java Client API to read and write documents:

As of MarkLogic 7.0-4, the MIME type mapping defined for a document's URI extension determines the document format (text, XML, JSON, or binary) when inserting documents and the MIME type returned when reading a document. Previously, the HTTP header (REST) or handle (Java) MIME type was preferred over the URI extension mapping.

- REST Client API Impact
- Java Client Impact

4.1.2.1 REST Client API Impact

As of MarkLogic 7.0-4, the MIME type mapping defined for a document's URI extension determines is preferred over the MIME type in Content-type (write) or Accept (read) header. For details, see Controlling Input and Output Content Type in the *REST Application Developer's Guide*.

In previous releases, the Content-type or Accept header MIME type mapping was preferred over the URI extension MIME type mapping.

For example, in previous releases, the following command inserted a text document into the database, regardless of the actual contents:

```
curl --anyauth --user user:password -X PUT -i \
  -H "Content-type: text/plain" \
  http://host:port/v1/documents?uri=example.json
```

In 7.0-4, the same request creates a JSON document, regardless of the input Content-type header.

Similarly, in previous releases, the following command previously returned a response with the Content-type header set to `application/unknown-binary`. As of 7.0-4, it returns `application/pdf` because of the MIME type mapping for the URI extension.

```
curl --anyauth --user user:password -X GET -i \
  http://host:port/v1/documents?uri=example.pdf
```

In most cases, you can replicate the previous behavior by using URIs with no extension or an unmapped extension, which forces reliance on the MIME type in the HTTP Content-type or Accept header. You can also modify the MarkLogic MIME type mappings. You can view and modify the MIME type mappings in the "Mimetypes" section of the Admin Interface.

4.1.2.2 Java Client Impact

As of MarkLogic 7.0-4, the MIME type mapping defined for a document's URI extension determines the document format (text, XML, JSON, or binary) when inserting a document and the MIME type returned when reading a document. In previous releases, the format or MIME type setting on the input or output handle took precedence over the URI extension MIME type mapping.

You may notice this change if you read or write documents where the URI extension is not in agreement with the format or MIME type. This includes the format/MIME type implied by particular handle types or `DocumentManager` subclasses, such as `DOMHandle` (XML) or `TextDocumentManager` (text). For example:

- Inserting a document with the URI “example.xml” and setting the format or MIME type to binary would previously create a binary document, but now will attempt to create an XML document.
- Using a `TextDocumentManager` to insert a document with URI “example.xml” previously created a text document, but now will create an XML document.
- Reading a document with a URI “example.txt” that contains XML using a DOMHandle previously worked, but now will result in an error because the data is returned with a MIME type `text/plain`.

In most cases, you can replicate the previous behavior by using URIs with no extension or an unmapped extension, which forces reliance on the MIME type or handle format. You can also modify the MarkLogic MIME type mappings. You can view and modify the MIME type mappings in the “Mimetypes” section of the Admin Interface.

4.2 Incompatibilities Between MarkLogic 7.0-3 and 7.0-2

This section describes the incompatibilities between MarkLogic 7.0-3 and 7.0-2.

- HDP No Longer a Supported Hadoop Platform
- Java API: ContentVersionRequest Property Deprecated
- REST API: content-versions Property Deprecated
- REST API: JSON documents Cannot be Retrieved as XML
- Float Precision Greater in 7.0-3

4.2.1 HDP No Longer a Supported Hadoop Platform

Hortonworks Data Platform (HDP) is no longer a supported Hadoop distribution for use with the MarkLogic Connector for Hadoop or the distributed mode of MarkLogic Content Pump (mlcp).

4.2.2 Java API: ContentVersionRequest Property Deprecated

The REST server configuration property ContentVersionRequest is now deprecated. If you currently use `com.marklogic.admin.ServerConfigurationManager.setContentVersionRequest()` and the related `ServerConfiguration.Policy` type, you should modify your application to use `com.marklogic.admin.ServerConfigurationManager.setUpdatePolicy()` and `ServerConfigurationManager.UpdatePolicy` instead. You should also change calls to `getContentVersionRequest()` into call to `getUpdatePolicy()`.

The table below shows the correspondence between `Policy` values and `UpdatePolicy` values. The behavior is unchanged with respect to these values.

If you used `Policy` Value...	Then use `UpdatePolicy` Value...
`NONE`	`MERGE_METADATA`
`REQUIRED`	`VERSION_REQUIRED`
`OPTIONAL`	`VERSION_OPTIONAL`

4.2.3 REST API: content-versions Property Deprecated

The REST instance configuration property `content-versions` is now deprecated, in favor of the new `update-policy` property.

If you currently set `content-versions`, you should modify your application to use the `update-policy` configuration property instead. For example, if you set this property using `PUT /v1/config/properties` or `PUT /v1/config/properties/content-versions`, then you should now use `PUT /v1/config/properties` or `PUT /v1/config/properties/update-policy` to set `update-policy` instead.

Similarly, you should modify any code that reads the configuration properties to expect `update-policy` instead of `content-versions`.

The table below shows the correspondence between `content-versions` values and `update-policy` values. The behavior is unchanged with respect to these values.

If you used `Policy` Value...	Then use `UpdatePolicy` Value...
`none`	`merge-metadata`
`required`	`version-required`
`optional`	`version-optional`

4.2.4 REST API: JSON documents Cannot be Retrieved as XML

In previous versions, you could use the REST Client API to retrieve the internal XML representation of a JSON document using `GET /v1/documents` and specifying XML in the `format` request parameter or `application/xml` in the Accept header.

As of MarkLogic 7.0-3, JSON documents are always returned as JSON. You can still examine the internal representation of a JSON document using XQuery or the Query Console database explorer.

4.2.5 Float Precision Greater in 7.0-3

In MarkLogic 7.0-3, the numeric precision of a float has increased. For example:

```
xs:float(3435.99884)
(: Returns 3436 in 7.0-2,
   returns 3435.999 in 7.0-3 :)
```

In most cases, this will not cause an incompatibility, as it is just returning a more precise number. But if you have application logic that relies on the old behavior, you will have to make changes to account for the greater precision.

4.3 Incompatibilities Between MarkLogic 7.0-2 and 7.0-1

This section describes the incompatibilities between MarkLogic 7.0-1 and 7.0-2.

- Change to JSON Output from the REST API
- Changes to the MarkLogic Connector for Hadoop API

4.3.1 Change to JSON Output from the REST API

The JSON output from the manage REST resource addresses with the `metrics` view has been changed and you may need to change any custom clients that consume this JSON data.

4.3.2 Changes to the MarkLogic Connector for Hadoop API

`com.marklogic.mapreduce.MarkLogicDocument` is now an interface instead of a class. The previous functionality of `MarkLogicDocument` is provided by the new class `com.marklogic.mapreduce.DatabaseDocument`.

Modify your code and job configuration to use DatabaseDocument instead of MarkLogicDocument.

4.4 Incompatibilities Between MarkLogic 7.0-1 and MarkLogic 6

- XQuery HTTP Client Built-In Functions Now Require a Privilege
- HTTP Client Functions Are Now HTTP 1.1 Compliant
- xdmp:get-request-username and xdmp:get-request-user Changes
- Specifying a Forest Now Only Works With Strict Locking
- Custom Dictionaries for Japanese and Chinese Languages Need to be Re-saved
- Default Attributes on XML Copy Changes

- Serialization of Alerting, Reverse, and Path Range Queries Change
- Java and REST Client API Incompatibilities
- Namespace Change for Properties Persisted Using JSON
- mlcp Incompatibilities
- REST Management API Version Incremented to v2
- Changes to the Configuration Manager
- xdmp:plan Now Requires a Privilege
- fn:analyze-string Now Returns Output in a Different Namespace

4.4.1 XQuery HTTP Client Built-In Functions Now Require a Privilege

The HTTP client XQuery APIs (`xdmp:http-delete`, `xdmp:http-get`, `xdmp:http-post`, `xdmp:http-put`, and so on) now require a privilege. Previously, these functions did not require a privilege. To support these privileges, the following privileges are added to MarkLogic 7:

- `http://marklogic.com/xdmp/privileges/xdmp-http-get`
- `http://marklogic.com/xdmp/privileges/xdmp-http-head`
- `http://marklogic.com/xdmp/privileges/xdmp-http-options`
- `http://marklogic.com/xdmp/privileges/xdmp-http-delete`
- `http://marklogic.com/xdmp/privileges/xdmp-http-post`
- `http://marklogic.com/xdmp/privileges/xdmp-http-put`

Additionally, the `network-access` role has been added, which contains all of these privileges.

If you have code that accesses these functions with a user that does not have the `admin` role, you will have to add these privileges (or the `network-access` role) to the set of privileges inherited by your users. For details on adding privileges, see Security Administration in the *Administrator's Guide*. For details on security, see *Understanding and Using Security Guide*.

4.4.2 HTTP Client Functions Are Now HTTP 1.1 Compliant

The XQuery HTTP client functions (`xdmp:http-delete`, `xdmp:http-get`, `xdmp:http-post`, `xdmp:http-put`, and so on) now fully implement HTTP 1.1, including the use of connection keep-alives and built-in decoding of chunked transfer encoded responses. In most cases, this will not cause any incompatible behavior, but if your code tried to perform some work to do HTTP 1.1 features such as taking a chunked response as a large binary and decoding the chunks in XQuery, then that code might behave differently in MarkLogic 7. If you have such code, you might need to rework it in MarkLogic 7.

4.4.3 xdmp:get-request-username and xdmp:get-request-user Changes

The `xdmp:get-request-username` and `xdmp:get-request-user` functions have changed slightly in MarkLogic 7.

In previous releases, `xdmp:get-request-username` always returned the user in the `Authorization` HTTP header; in MarkLogic 7, if you are using application-level authentication, then it returns the user from the last succesful call to `xdmp:login` (when using any other authentication scheme, it is unchanged from previous releases and returns the user in the `Authorization` HTTP header).

In previous releases, `xdmp:get-request-user` returned the ID of the current user; in MarkLogic 7, if you are using application-level authentication, then it returns the user ID from the last succesful call to `xdmp:login` (when using any other authentication scheme, it now returns the user ID corresponding to the user in the `Authorization` HTTP header). If you want the old behavior of returning the ID of the current user, use the new function `xdmp:get-current-userid`.

If you have any code that uses the `xdmp:get-request-username` or `xdmp:get-request-user` functions, you might need to change it to work with the current behavior.

4.4.4 Specifying a Forest Now Only Works With Strict Locking

The various loading APIs (for example, `xdmp:document-load` and `xdmp:document-insert`) have an option to specify the forest in which a document is loaded. In MarkLogic 7, those forest options are only available with the `locking` parameter on the database set to `strict` (the default is `fast`). If you try to specify forest placement with `fast` locking, it will throw an XDMP-PLACEKEYSLOCKING exception. Previously, this operation would be allowed.

In most cases, it is not recommended to specify a placekey, as MarkLogic does a good job of distributing data. If you want to continue to use the forest placekeys when loading or updating, you must change your `locking` parameter to `strict` or change your code to no longer use forest placekeys. You can also consider using Tiered Storage to control what data goes into which forests. For details on Tiered Storage, see Tiered Storage in the *Administrator's Guide*.

4.4.5 Custom Dictionaries for Japanese and Chinese Languages Need to be Re-saved

In MarkLogic 7, there is a change to the way custom dictionaries are stored for languages that use a unified cd (Japanese and both Simplified and Traditional Chinese). The custom dictionaries for those languages now have separate files for tokenization and for stemming. If you are using these languages and you have created a custom dictionary, you must re-save the custom dictionary in MarkLogic 7, which will save it in the new format.

For example, if you have a Japanese language custom dictionary, run the following XQuery program to re-save the custom dictionary:

```
import module namespace
   cdict="http://marklogic.com/xdmp/custom-dictionary"
   at "/MarkLogic/custom-dictionary.xqy";
```

```
cdict:dictionary-save("ja", cdict:dictionary-read("ja"))
```

This will re-save the dictionary to the new format.

4.4.6 Default Attributes on XML Copy Changes

In MarkLogic 7, the behavior of default attributes has changed when you are copying XML nodes that have an in-scope schema with default attributes. In MarkLogic 6, the default attributes were applied in the copied node. In MarkLogic 7, the default attributes are still applied in the data model of the copied node, but they will only be serialized if `default-attributes=yes` is set in the serialization options (for example, the `xdmp:output` option). This is true for copied nodes in both XQuery (for example, see below) and XSLT (for example, `xsl:copy`).

The following shows an example using the XHTML schema, which is always in-scope.

```
xquery version "1.0-ml";
declare option xdmp:output "default-attributes=no";
(: the above xdmp:output declaration is the default :)

<x>{xdmp:unquote('<html xmlns="http://www.w3.org/1999/xhtml">
    <body>
       <p>hello</p>
    </body>
</html>
')}</x>
=>
In MarkLogic 7 returns: (no default attributes on html element)

<x>
  <html xmlns="http://www.w3.org/1999/xhtml">
    <body>
       <p>hello</p>
    </body>
  </html>
</x>

In MarkLogic 6 returns: (added default attribute version
                         on html element)
<x>
  <html version="-//W3C//DTD XHTML 1.1//EN"
        xmlns="http://www.w3.org/1999/xhtml">
    <body>
       <p>hello</p>
    </body>
  </html>
</x>
```

If the `xdmp:output` option is set to `default-attributes=yes`, then the attributes will continue to be serialized in MarkLogic 7. Furthermore, if the copied node is used in another schema that has different default values for the default attributes, then the resulting default value for those attributes comes from the copied node, not the new schema. This change is not likely to impact very many applications, and the new behaviour is what most people would expect, but if you have code that relies on the old behavior, you will need to explicitly set the `xdmp:output` option is set to `default-attributes=yes`.

4.4.7 Serialization of Alerting, Reverse, and Path Range Queries Change

The serialization of path range index queries has changed to use `cts:path-expression` rather than `cts:path` as the element name. This affects not only stored path range index queries, but also stored Alerting queries and reverse queries. All such queries must be transformed to the new serialization and reloaded.

The following XSLT stylesheet makes the required change:

```
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
                xmlns:cts="http://marklogic.com/cts"
                version="2.0">
  <xsl:template match="cts:path">
    <xsl:element name="cts:path-expression">
      <xsl:copy-of select="namespace::*|@*|node()"/>
    </xsl:element>
  </xsl:template>
</xsl:stylesheet>
```

You can apply the stylesheet to affected documents using a query similar to the following:

```
xquery version "1.0-ml";
for $query in fn:collection("my-stored-queries")
return xdmp:node-replace($query, xdmp:xslt-eval($stylesheet, $query)
```

4.4.8 Java and REST Client API Incompatibilities

Unless otherwise noted, the following changes can affect applications using either the REST or Java Client API:

- Content Transformations on JSON Documents Operate on XML
- Resource Service Extensions Moved to Modules Database on Upgrade
- JSON Key Name Change for System Properties
- Java Batch Example Package Name Change

4.4.8.1 Content Transformations on JSON Documents Operate on XML

This topic applies to REST and Java Client API applications that include custom content transformations for JSON documents.

JSON documents are stored in MarkLogic Server as XML. In MarkLogic 6, content transformation functions were invoked on JSON documents after conversion from JSON to XML. In MarkLogic 7, content transformations are applied before this conversion.

If you created a content transformation for MarkLogic 6 that expects JSON input, you must modify your implementation to expect XML in the `http://marklogic.com/xdmp/json/basic` namespace instead of JSON text. For details on the XML representation, see Working With JSON in *Application Developer's Guide*.

Transformations invoked during ingestion must similarly be modified to produce XML that conforms to the internal representation for JSON documents. Transformations invoked during document retrieval can either produce conforming XML or JSON text as when generating JSON output.

For details on the new expectations, see Expected Input and Output in *REST Application Developer's Guide*.

4.4.8.2 Resource Service Extensions Moved to Modules Database on Upgrade

This topic applies to REST and Java Client API applications running on a REST API instance created with MarkLogic 6.0-1 or later that use resource service extensions.

REST API instances created with MarkLogic Server version 6.0-1 stored resource service extensions in the Extensions database. REST API instances created with MarkLogic Server version 6.0-2 or later install resource service extensions in the modules database associated with the instance.

When you upgrade from MarkLogic 6 to MarkLogic 7 or later, any resource service extensions stored in the Extensions database on behalf of a 6.0-1 REST API instance are automatically migrated from the Extensions database to the modules database for you.

If your resource extension has dependent libraries or other assets that you installed in the Extensions database, you should migrate them by re-installing them using the new `/ext` service. For details, see Managing Dependent Libraries and Other Assets in *REST Application Developer's Guide*.

4.4.8.3 JSON Key Name Change for System Properties

This topic applies to REST applications that reference document properties using the JSON representation.

When you retrieve document properties in JSON format, protected system properties such as last-modified are now enclosed in an object with the key `$ml.prop`. In MarkLogic 6, such properties were immediate children of the `properties` container. User-defined property naming is unchanged.

The example output below shows the change in how the last-modified property value is returned by a request of the form `GET /v1/documents?uri=your-uri&category=properties&format=json`:

MarkLogic 6	MarkLogic 7

{"properties":{
"last-modified":"*value*"
}}
	{"properties":{
	"$ml.prop":{
	"last-modified":"*value*"
	}
	}}

4.4.8.4 Java Batch Example Package Name Change

The Java example application in the package `com.marklogic.client.example.batch` is now in the package `com.marklogic.client.example.extension`. If your application references any classes or interfaces from this package, you must change your package imports and recompile.

4.4.9 Namespace Change for Properties Persisted Using JSON

This topic applies to REST and Java Client API applications that insert or update document properties using JSON and either of the following are true:

- You define indexes based on JSON property keys.
- Your application includes a content transformation, resource extension, or other code that that manipulates JSON property metadata in its XML representation.

In MarkLogic 6, inserting or updating user-defined document properties using JSON stored the properties as XML elements in the namespace `http://marklogic.com/json`. In MarkLogic 7, such properties are stored as elements in the namespace `http://marklogic.com/xdmp/json/basic`. If you insert or update a property using JSON using MarkLogic 7, the new namespace is used.

If you convert properties in the old namespace to the new namespace, then all pre-existing and future properties will use the new namespace. If you do not perform such a conversion, then you should adapt your indexes and queries to accommodate both namespaces because pre-existing properties will be in the MarkLogic 6 namespace while new or updated properties will be in the MarkLogic 7 namespace.

After upgrading to MarkLogic 7, use one of the following solutions to adapt your content and application to this change:

- Modify Pre-Existing Properties
- Modify Queries to Use Both Namespaces
- Create a Field That Spans Both Namespaces

4.4.9.1 Modify Pre-Existing Properties

Use a query similar to the one in this section to change the namespace of all properties in the old namespace. The example query uses `xdmp:spawn` to perform the property update in batches, thereby avoiding overly large transactions.

The procedure below assumes you have an App Server, such as a REST API instance, associated with your content database. If you are not familiar with Query Console, see *Query Console User's Guide*.

The following procedure walks you through installing a transform query in the modules root of an App Server attached to an affected database, and then running the query to modify a specific property.

1. Save the following transform query to a file, such as `update-props.xqy`. You will changed the bolded text in the next step.

```
xquery version "1.0-ml";

declare namespace prop   = "http://marklogic.com/xdmp/property";
declare namespace old-ns = "http://marklogic.com/json";

declare default function namespace
   "http://www.w3.org/2005/xpath-functions";
declare option xdmp:mapping "false";

declare function local:transform(
    $elem as element()
) as element()
{
    let $elem-name :=
        if (exists($elem/self::old-ns:*))
        then QName("http://marklogic.com/xdmp/json/basic",
                   local-name($elem))
        else node-name($elem)
    return element {$elem-name} {
        $elem/@*,
        for $child in $elem/node()
        return
            typeswitch ($child)
            case element() return local:transform($child)
            default return $child
        }
};

let $max   := 100
let $batch :=
    subsequence(
        cts:search(collection(),
            cts:properties-query(
                cts:element-query(xs:QName("old-ns:my-prop"),
                                  cts:and-query(()))
```

```
                    )
                ),
            1,
            $max
            )/document-uri(.)
    return
        if (empty($batch)) then ()
        else (
            for $doc-uri in $batch
            let $current-props  := xdmp:document-properties($doc-uri) /
                prop:properties/(* except prop:last-modified)
            let $modified-props := $current-props/local:transform(.)
            return xdmp:document-set-properties($doc-uri, $modified-props),
            if (count($batch) lt $max) then ()
            else xdmp:spawn("/some/path/update-props.xqy")
            )
```

2. Modify the saved query to match your environment by making the following changes:

   a. Change occurrences of “my-prop” to the name of an affected property in your content.

   b. Change the module path in the `xdmp:spawn` call to the path where you will install the query in your modules root.

3. Install the saved file in the modules database or modules root of your App Server. Install the module under the path you chose in Step 2b.

   a. To install the modules database of a REST API instance using the REST API, see Managing Dependent Libraries and Other Assets in *REST Application Developer's Guide*.

   b. To install in the modules database of a REST API instance using Java API, see Managing Dependent Libraries and Other Assets in *Java Application Developer's Guide*.

   c. To install in the modules database using XQuery, run a query similar to the following in Query Console, after modifying the filesystem path and database URI. The file must be accessible to MarkLogic Server. Run the query with the modules database as the content source.

```
xquery version "1.0-ml";
xdmp:document-load(
  "/filesystem/path/update-props.xqy",
  <options xmlns="xdmp:document-load">
    <uri>/some/path/update-props.xqy</uri>
  </options>
  )
```

4. Run the transform query using Query Console.

a. Create a new query in Query Console with the following contents:

```
xquery version "1.0-ml";
xdmp:invoke("/my.domain/update-props.xqy")
```

b. Modify the module URI in the `xdmp:spawn` call to the URI under which you installed the module in Step 3.

c. In the Query Console Content Source dropdown, select the source that corresponds to your content database and the modules database in which you installed the transform query in Step 3.

d. Click the Run button to perform the transformation.

5. If your database is large, you might exceed the maximum number of spawned queries. If this happens, wait for the previous spawns to complete, and then run the query again.

You must also modify any range indexes, queries, or query options for this property that depend on the old namespace. Change occurrences of `http://marklogic.com/json` to `http://marklogic.com/xdmp/json/basic`.

For example, if in MarkLogic 6 you defined an element range index over the property `my-property` in the namespace `http://marklogic.com/json`, modify the your index configuration to use the namespace URI `http://marklogic.com/xdmp/json/basic`.

Similarly, if you have queries or constraint definitions using the old namespace, change them to use the new namespace. The table below contains an example of how to modify a properties constraint to use the new namespace:

Version	Example

MarkLogic 6	`<options xmlns="http://marklogic.com/appservices/search">`
	`  <constraint name="my-prop">`
	`  <range type="xs:string">`
	`  <element name="my-property"`
	`  **ns="http://marklogic.com/json"** />`
	`  <fragment-scope>properties</fragment-scope>`
	`  </range>`
	`  </constraint>`
	`</options>`

MarkLogic 7	`<options xmlns="http://marklogic.com/appservices/search">`
	`  <constraint name="my-prop">`
	`  <range type="xs:string">`
	`  <element name="my-property"`
	`  **ns="http://marklogic.com/xdmp/json/basic"** />`
	`  <fragment-scope>properties</fragment-scope>`
	`  </range>`
	`  </constraint>`
	`</options>`

4.4.9.2 Modify Queries to Use Both Namespaces

You can modify your queries and query options to accomodate both namespaces. For example, if your query options already include a constraint on the old namespace, add a constraint for the new namespace, and then use an OR query to apply both constraints.

The following example uses a JSON structured or-query to demonstrate this techniqe. It assumes the existence of an element range index on the property in the new namespace.

```
{"search": {
  "options": {
    "constraint": [
      {
        "name": "old-prop",
        "range": {
          "type": "xs:string",
          "element": {
            "name": "my-property",
            "ns": "http://marklogic.com/json"
          },
          "fragment-scope": "properties"
        }
      },
      {
```

```
            "name": "new-prop",
            "range": {
              "type": "xs:string",
              "element": {
                "name": "my-property",
                "ns": "http://marklogic.com/xdmp/json/basic"
              },
              "fragment-scope": "properties"
            }
          }
      ]
    },
    "query" : {
      "or-query" : {
        "queries" : [
          {"range-constraint-query": {
            "constraint-name": "old-prop",
            "value": "the value"
          }},
          {"range-constraint-query": {
            "constraint-name": "new-prop",
            "value": "the value"
          }}
      ]}
    }
  }}
```

4.4.9.3 Create a Field That Spans Both Namespaces

Use this procedure to replace an existing element range index over the property in the old namespace with a field range index that covers both namespaces, and then modify your code and queries to the use new index. To learn more about fields, see Fields Database Settings in *Administrator's Guide*.

1. Use the Admin Interface to define namespace prefixes for `http://marklogic.com/json` and `http://marklogic.com/xdmp/json/basic`. For details, see Steps 1-8 of Defining Path Range Indexes in *Administrator's Guide*.

2. Create a field that includes two paths, one for the property in each namespace. Use the namespace prefixes defined in Step 1. For example, add the paths `old-ns:my-property` and `new-ns:my-property`. For details, see Configuring a New Field in *Administrator's Guide*.

3. Create a field range index over the new field. For details, see Creating a Range Index on a Field in *Administrator's Guide*.

4. Modify any extensions, transformations, queries or query options that rely on the old element range index to use the new field range index. The example below shows a combined query modified to use the new field range index instead of the old element range index.

Old	New

{ "search": {
"options": {
"constraint": {
"name": "my-prop",
"range": {
"type": "xs:string",
"element": {
"name": "my-property",
"ns": "http://marklogic.com/json"
},
"fragment-scope": "properties"
}}},
"query" : {
"range-constraint-query": {
"constraint-name": "my-prop",
"value": "the value"
}}
}}
	{"search": {
	"options": {
	"constraint": {
	"name": "my-prop",
	"range": {
	"type": "xs:string",
	"field": {
	"name": "my-new-property"
	},
	"fragment-scope": "properties"
	}}},
	"query" : {
	"range-constraint-query": {
	"constraint-name": "my-prop",
	"value": "the value"
	}}
	}}

4.4.10 mlcp Incompatibilities

MarkLogic Content Pump (mlcp) version 1.1 includes the following changes that potentially affect compatibility for users of mlcp version 1.0-*.

- Compressed Input Default URI Includes Input Filename
- Default Character Encoding Changed to UTF-8

4.4.10.1 Compressed Input Default URI Includes Input Filename

The following change might affect you if you use mlcp to load documents from compressed files (`-input_compressed`). Documents created with mlcp v1.0 used the following default URI template:

```
/path/inside/zip/filename
```

Starting with version 1.1, the default URI template is:

```
/compressed-file-path/path/inside/zip/filename
```

This change can affect the `-output_uri_replace` patterns needed to create documents with the same URIs as those created with mlcp 1.0.

For details, see Default Document URI Construction in *Loading Content Into MarkLogic Server Guide*.

4.4.10.2 Default Character Encoding Changed to UTF-8

The default content character encoding when importing and exporting documents with mlcp has changed to UTF-8. Previously, mlcp used the platform default encoding for the host which mlcp was running.

You can get the previous behavior by using the following option setting:

```
-content-encoding system
```

4.4.11 REST Management API Version Incremented to v2

The REST Management API version has been incremented to v2. The v1 services are no longer available. If you send a request using a v1 URL, MarkLogic Server responds with status code 410 (Gone) and a `MANAGE-UNSUPPORTEDVERSION` error.

Requests that use `LATEST` as the version when constructing requests will continue to work. However, you may need to make other changes due to the behavior changes between v1 and v2.

The incompatibilities between v1 and v2 are detailed in the remainder of this section

- View Parameter Required Instead of Path Steps
- JSON Output Includes Units
- Element/Key Name Changes in Status Views
- Changes to the Management API Plugins
- Changes to the Packaging API

4.4.11.1 View Parameter Required Instead of Path Steps

In previous releases, there were two ways to access some views: by path step or using the `view` request parameter. In MarkLogic 7, the path step form of URL has been removed. You must now use the `view` parameter. For example, MarkLogic 6 supported the following two ways of requesting database status, where *`version`* is `v1` or `LATEST`:

```
GET /manage/version/databases/{id|name}/status
GET /manage/version/databases/{id|name}?view=status
```

In MarkLogic 7, only the second form is supported, as shown in the example below, where *`version`* is `v2` or `LATEST`.

```
GET /manage/version/databases/{id|name}?view=status
```

This change applies to the `config`, `counts`, `edit`, and `status` views for clusters, databases, forests, groups, hosts, and servers. The table below lists the affected GET methods and the equivalent MarkLogic 7 URL.

Previous Form	MarkLogic 7 Form
/manage/v1/clusters/{id|name}/config	/manage/v2/clusters/{id|name}?view=config
/manage/v1/clusters/{id|name}/status	/manage/v2/clusters/{id|name}?view=status
/manage/v1/databases/{id|name}/config	/manage/v2/databases/{id|name}?view=config
/manage/v1/databases/{id|name}/counts	/manage/v2/databases/{id|name}?view=counts
/manage/v1/databases/{id|name}/edit	/manage/v2/databases/{id|name}?view=edit
/manage/v1/databases/{id|name}/status	/manage/v2/databases/{id|name}?view=status
/manage/v1/forests/{id|name}/config	/manage/v2/forests/{id|name}?view=config
/manage/v1/forests/{id|name}/counts	/manage/v2/forests/{id|name}?view=counts
/manage/v1/forests/{id|name}/edit	/manage/v2/forests/{id|name}?view=edit
/manage/v1/forests/{id|name}/status	/manage/v2/forests/{id|name}?view=status
/manage/v1/groups/{id|name}/config	/manage/v2/groups/{id|name}?view=config
/manage/v1/groups/{id|name}/counts	/manage/v2/groups/{id|name}?view=counts
/manage/v1/groups/{id|name}/edit	/manage/v2/groups/{id|name}?view=edit
/manage/v1/groups/{id|name}/status	/manage/v2/groups/{id|name}?view=status
/manage/v1/hosts/{id|name}/config	/manage/v2/hosts/{id|name}?view=config
/manage/v1/hosts/{id|name}/counts	/manage/v2/hosts/{id|name}?view=counts
/manage/v1/hosts/{id|name}/edit	/manage/v2/hosts/{id|name}?view=edit
/manage/v1/hosts/{id|name}/status	/manage/v2/hosts/{id|name}?view=status
/manage/v1/servers/{id|name}/config	/manage/v2/servers/{id|name}?view=config
/manage/v1/servers/{id|name}/edit	/manage/v2/servers/{id|name}?view=edit
/manage/v1/servers/{id|name}/status	/manage/v2/servers/{id|name}?view=status

4.4.11.2 JSON Output Includes Units

JSON output for the various GET methods now includes units for metrics that were previously flat key-value pairs. The following template summarizes the difference:

- MarkLogic 6: `"key" : the-value`
- MarkLogic 7: `"key" : { "units" : "the-units", "value" : the-value }`

For example, in MarkLogic 6, `elapsed-time` was reported as follows:

```
"elapsed-time" : "0.023453"
```

In MarkLogic 7, this field include a unit, as shown in this example:

```
"elapsed-time" : { "units" : "sec", "value" : "0.023453" }
```

4.4.11.3 Element/Key Name Changes in Status Views

The following XML element/JSON key name changes have been made:

- Many element/key names with a “total-” prefix in status views no longer use this prefix. This change affects the `load-detail` and `rate-detail` sections of the status views for clusters, databases, forests, groups, and hosts.
- The `on-disk-size` element/key of the databases status view has been renamed to `data-size`. This change affects `GET /manage/version/databases/{id|name}?view=status` output.

For example, in earlier releases, the `load-detail` section of the report returned by `GET /manage/LATEST/hosts/{id|name}?view=status` includes a `total-query-read-load` element/key. The equivalent data is now named `query-read-load`.

4.4.11.4 Changes to the Management API Plugins

There have been some changes to the Management API plugins for MarkLogic 7, so if you have a plugin written against previous versions, depending upon the plugin, you might need to update it.

In previous releases (MarkLogic 5 and MarkLogic 6), plugins are installed in the following folder:

```
Assets/plugins/marklogic/manage/v1
```

Plugins installed to this directory will continue to work with the following exceptions:

- Previous releases support 3 types of plugins: "format", "resource", and "view extender". In MarkLogic 7:
    - No changes are necessary for "format" plugins, these will continue to work as before with no changes to the plugin module or on the client side.
    - New plugins installed in MarkLogic 7 or later should be created in:

```
Assets/plugins/marklogic/manage/extensions
```

- For "resource" plugins, clients must change the version step to `LATEST` (from `v1`). For example, `/manage/LATEST/myplugin`. No changes are required to the plugin code.
- Support is no longer available for the third type of plugin ("view extender"). If you have a plugin of this type, you can rewrite it as a resource plugin in MarkLogic 7 to provide the same functionality.

For details on extending the Management API with plugins, see Extending Management API with Plugins in the *Monitoring MarkLogic Guide*.

4.4.11.5 Changes to the Packaging API

The Packaging REST API has changed for MarkLogic 7. Applications written using the MarkLogic 6 Packaging REST API (v1) must be rewritten to work with the MarkLogic 7 Packaging REST API (v2).

The differences between the v1 and v2 versions of the Packaging REST API are summarized in the table below.

MarkLogic 6	MarkLogic 7

`/v1/list/package/appserver={name} (GET)`	`/v2/servers/{name}?view=package (GET)`
	
	`/v2/packages/{pkgname} (POST)`

`/v1/list/package/database={name} (GET)`	`/v2/databases/{name}?view=package (GET)`
	
	`/v2/packages/{pkgname} (POST)`

`/v1/package/compare (GET)`	`/v2/packages/{pkgname}?view=differences (GET)`
`/v1/package/install (POST)`	`/v2/packages/{pkgname}/install (POST)`
`/v1/package-tickets/revert (POST)`	`/v2/tickets/{ticketnumber}/revert (PUT)`

4.4.12 Changes to the Configuration Manager

The Configuration Manager Packaging feature has been more tightly integrated with the Configuration Manager. Rather than exporting configurations to an XML file, as in MarkLogic 6, configurations in MarkLogic 7 are now exported, as XML, to a ZIP file.

You can import a configuration saved by MarkLogic 6 into MarkLogic 7. However, you cannot import a configuration saved in MarkLogic 7 into MarkLogic 6.

4.4.13 xdmp:plan Now Requires a Privilege

In MarkLogic 7, the `xdmp:plan` function requires a privilege (`http://marklogic.com/xdmp/privileges/xdmp-plan`). Previously, it did not require a privilege. If you have any code that calls `xdmp:plan` that is run by non-priveleged users, you will need to add the privilege to a role that the users are granted (or to a role that they already have).

4.4.14 fn:analyze-string Now Returns Output in a Different Namespace

In MarkLogic 7, the `fn:analyze-string` function returns an XML node in the `http://www.w3.org/2005/xpath-functions` namespace, which is the namespace specified by the working draft of the latest XQuery specification. Previously, this function was not fully specified and it returned XML in the `http://www.w3.org/2009/xpath-functions/analyze-string` namespace. If you have code that is expecting output in the old namespace, you will need to change that code to expect the new namepsace.

4.5 Incompatibilities Between MarkLogic 6 and 5.0

MarkLogic 7 allows you to upgrade either from MarkLogic 6, 5.0, or 4.2. If you are upgrading from 4.1, you must first upgrade to at least 4.2, and there are some known incompatibilities between 4.1 and 4.2 that are documented in the 4.2 *Release Notes*. If you are upgrading from MarkLogic 6, you can skip this section. For convenience, the incompatibilities between MarkLogic 6 and 5.0 are repeated here, and are as follows:

- 32-bit and Solaris SPARC Platforms are No Longer Supported
- Default Database Settings Changes
- Serialization Changes for xdmp:from-json and xdmp:to-json
- fn:format-dateTime Functions Now Round to 7 Places Instead of 3
- xdmp:sha1, xdmp:sha256, xdmp:sha512 Not Supported in FIPS Mode
- Values of Type xs:date Sometimes Serialize With Timezone
- DocumentInputFormat Default Input Value Class is MarkLogicDocument
- Application Builder Generated App Differences
- app-user Role Now Has the rest-reader Role
- fn:resolve-uri in XSLT Now Requires a Scheme When Using the Second Parmeter
- MarkLogic Content Pump 1.0-2 Requires MarkLogic Server 6.0-2
- Starting With 6.0-2, XCC Has a New insertContentCollectErrors() Method on the Java Session Interface
- New Aggregate Input Default URI in mlcp 1.0-3
- As of 6.0-5, HDP is no longer a supported Hadoop platform

4.5.1 32-bit and Solaris SPARC Platforms are No Longer Supported

MarkLogic 7 discontinues support for all 32-bit platforms (32-bit Windows and 32-bit Linux) and also discontinues support for Sun Solaris SPARC. 64-bit operating systems are required. Sun Solaris is supported on x64 platforms only. If you are using one of the discontinued platforms, you will need to migrate your environment to a supported platform. For details on supported platforms, see “Supported Platforms” on page 8.

4.5.2 Default Database Settings Changes

There are several changes to the default settings when you create a new database. The changes are to turn off some features that you might not need by default and to enable the URI lexicon by default. If you need the feature, you can enable it when or after you create the database configuration. The following are the new default values for the settings that changed:

- `maintain last modified` is set to `false`
- `directory creation` is set to `manual`

- `inherit permissions` is set to `false`
- `inherit collections` is set to `false`
- `inherit quality` is set to `false`
- `URI lexicon` is set to `true`

If you plan to use WebDAV on a database, then set `directory creation` to `automatic`. If you want any of the other options to behave as they did with the previous defaults, then modify them when you create the database or after you create the database. If you have scripts that relied on the old default values, you will need to update the scripts to modify the values.

4.5.3 Serialization Changes for xdmp:from-json and xdmp:to-json

The `xdmp:from-json` built-in function serializes as xml that is a serialization of a `json:array` in MarkLogic 7, with key/value pairs expressed as `json:objects`. Previously, they were serialized as a `map:map` and as sequences. Also, null values behave differently and are now included in the JSON output from `xdmp:to-json`. JSON array objects are now returned as `json:arrays` instead of sequences. Because of these changes, any code you have that uses `xdmp:to-json` and `xdmp:from-json` will not work the same way as it did in MarkLogic 5, and will need rewriting.

If you have code that uses these functions, consider rewriting it to use the new json:transform-from-json and json:transform-to-json XQuery library modules. For details, see Working With JSON in the *Application Developer's Guide*.

4.5.4 fn:format-dateTime Functions Now Round to 7 Places Instead of 3

In MarkLogic 7, the `fn:format-dateTime` function, as well as all of the other format functions that show fractional seconds, rounds the seconds to 7 fractional digits. Previously, it rounded to 3 fractional digits, so it is now more precise than it used to be. If you have code that relies on the old rounding behavior, you might see different (and more accurate) answers in MarkLogic 7.

4.5.5 xdmp:sha1, xdmp:sha256, xdmp:sha512 Not Supported in FIPS Mode

MarkLogic 7 runs by default in FIPS mode, which require ciphers and other security requirements that are secure according to FIPS 140-2. The `xdmp:sha1`, `xdmp:sha256`, and `xdmp:sha512` functions are not FIPS 140-2 compliant, and are therefore not allowed in the default FIPS mode; in FIPS mode, these functions throw an exception. If you want to use these functions, you will need to turn FIPS mode off. Alternately, you can change your code to use the more secure `xdmp:hmac-sha1`, `xdmp:hmac-sha256`, or `xdmp:hmac-sha512` functions, which are supported in FIPS mode.

4.5.6 Values of Type xs:date Sometimes Serialize With Timezone

In MarkLogic 7, some range index values that have timezones associated with them include the timezone when retrieved through lexicon functions (`cts:element-values`, `cts:element-attribute-values`, and so on). This difference only occurs for date values that have a timezone different from the current timezone, and only when stored in a range index. Previously, those date values did not include the timezone. For example,

```
xquery version "1.0-ml";

(:
   assumes an element range index is
   configured for the element "hello"
:)
xdmp:document-insert("/date.xml",
<hello>{fn:adjust-date-to-timezone(xs:date("2012-08-10"),
        xs:dayTimeDuration("-PT5H"))}</hello>);

cts:element-values(xs:QName("hello"), (), "type=date")

(:
   returns 2012-08-10-05:00 in MarkLogic 6
   returns 2012-08-10 in MarkLogic 5
:)
```

If you have date range index values stored in range indexes and if your code expects those values to not have timezones, then you will need to modify the code to handle timezones when they occur.

4.5.7 DocumentInputFormat Default Input Value Class is MarkLogicDocument

In MarkLogic Connector for Hadoop 1.1 the default input value class for `com.marklogic.mapreduce.MarkLogicDocument` is `com.marklogic.mapreduce.DocumentInputFormat`. In 1.0, the default input value class was `com.marklogic.mapreduce.MarkLogicNode`. To restore the 1.0 behavior, add the following to your MapReduce configuration file:

```
<property>
  <name>mapreduce.marklogic.input.valueclass</name>
  <value>com.marklogic.mapreduce.MarkLogicNode</value>
</property>
```

4.5.8 Application Builder Generated App Differences

The applications generated from Application Builder are considerably different in MarkLogic 7 than they were in MarkLogic 5. In MarkLogic 7, the applications use the REST API and do not have any XQuery code. The following are some of the differences:

- The generated applications use the REST API and are hosted on a REST API instance.
- The generated applications are now 100% html and javascript; there is no XQuery code directly in the application.
- The default quality weight is now 0. Previously, it was 1. The new default value of 0 is the default for the REST API (which applications generated with Application Builder use) makes search performance faster.
- Any customizations built in MarkLogic 5 will be lost if you re-generate the application in MarkLogic 7.

If you have customizations of your generated applications or if you rely on any of the old application features, then you will need to rework those in MarkLogic 7. For details on Application Builder and the applications it generates, see the *Application Builder Developer's Guide*.

4.5.9 app-user Role Now Has the rest-reader Role

In MarkLogic 7, the `app-user` role now inherits the `rest-reader` role. Previously it did not have this role. The REST API uses the `rest-reader` role by default to put permissions on documents, so when you create documents without explicitly specifying permissions using the REST API or the Java API, users with the `rest-reader` role (and therefore uses with the `app-user` role because it inherits `rest-reader`) can read the documents. This should not cause an incompatibility for existing applications, as the `rest-reader` role did not exist in previous versions of MarkLogic, but those users might be able to read new documents created in MarkLogic 7 using the REST API or the Java API. If you have users who have the `app-user` role, be aware that they will have this additional role.

4.5.10 fn:resolve-uri in XSLT Now Requires a Scheme When Using the Second Parmeter

If you use `fn:resolve-uri` in an XSLT stylesheet, it now runs in strict mode and therefore, if you sepcify the second parameter, the second parameter must be a valid base URI and include a scheme; that is, it cannot start with a slash. The following query demonstrates this change:

```
xquery version "1.0-ml";

xdmp:xslt-eval(
<xsl:stylesheet version="2.0"
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
<xsl:template match="/">
  <xsl:value-of select="resolve-uri('../foo','/bar/boo/bat.xml')"/>
</xsl:template>
</xsl:stylesheet>, document{<_/>})
(:
  returns /bar/foo in 5.0, throws
  XDMP-RELURIBASEARG  in 6.0
:)
```

If you have XSLT code that relies on the old behavior, you will have to modify your code so it does not throw `XDMP-RELURIBASEARG`. You can put a scheme (such as `http://`) in the second parameter, call the function in an XQuery `1.0-ml` module, or use another means besides `fn:resolve-uri`.

4.5.11 MarkLogic Content Pump 1.0-2 Requires MarkLogic Server 6.0-2

MarkLogic Content Pump (mlcp) 1.0 should not be used with MarkLogic Server 6.0-2 or later. Use mlcp 1.0-2 or later with MarkLogic Server 6.0-2 or later.

4.5.12 Starting With 6.0-2, XCC Has a New insertContentCollectErrors() Method on the Java Session Interface

Starting with 6.0-2, XCC has a new method on the `Session` interface. If you recompile a program with the 6.0-2 or later jar file, and if that program implements the `Session` interface, then you will need to add the `insertContentCollectErrors()` method to your source code so your interface implements this function. For example, the open source XQSync program implements the `Session` interface, so if you have old source code for it, when you recompile it you will need to implement the new method in its `Session` interface. You should only need to do this if you are recompiling; if you are not recompiling the program, then it should continue to work with the new XCC jar.

4.5.13 New Aggregate Input Default URI in mlcp 1.0-3

The following change might affect you if you use mlcp to load documents from aggregate input (`-input_file_type aggregates`) and rely on the default URI generation. If you use `-aggregate_uri_id` when loading from aggregate files, you should not be affected by this change.

Documents created with earlier versions of mlcp used the following default URI template:

```
hash_or_taskid-seqnum
```

Starting with mlcp version 1.0-3, the default URI template is:

```
/path/filename-split_start-seqnum
```

For details, see Default Document URI Construction in *Loading Content Into MarkLogic Server Guide*.

4.5.14 As of 6.0-5, HDP is no longer a supported Hadoop platform

Starting with 6.0-5, Hortonworks Data Platform (HDP) is no longer a supported Hadoop distribution for use with the MarkLogic Connector for Hadoop or the distributed mode of MarkLogic Content Pump (mlcp).

4.6 Incompatibilities Between 4.2 and 5.0

MarkLogic 5 and later allows you to upgrade either from MarkLogic 6, 5.0, or 4.2. If you are upgrading from 4.1, you must first upgrade to at least 4.2, and there are some known incompatibilities between 4.1 and 4.2 that are documented in the 4.2 *Release Notes*. If you are upgrading from 5.0, you can skip this section. For convenience, the incompatibilities between 5.0 and 4.2 are repeated here, and are as follows:

- Quote Marks Required for Direct Attribute Constructors
- repair-none Option of xdmp:unquote Throws Exception With Multiple Nodes
- XCC/J AutoCommit Methods No Longer Available
- Post-Commit Triggers Now Execute on the D-Node
- XCC Queries That Fetch XML Documents Return Document Nodes
- Flexible Replication Database Need an Update to their Configuration
- Upgrading 4.2 Custom Plugins to MarkLogic 7
- infodev:filesystem-walk $function Parameter Requires a Different Signature
- Some Samples Have Moved to developer.marklogic.com
- Docs App Server is Now Application Services App Server
- Third Parameter of search:remove-constraint is Now Required
- mapreduce.marklogic.output.batchsize No Longer Controls Transaction Size

4.6.1 Quote Marks Required for Direct Attribute Constructors

In MarkLogic 5 and later, quote marks (single or double) are required around the attribute value in a direct attribute constructor. On previous releases, the quote marks are inserted if they are not supplied. The XQuery specification requires them and, in MarkLogic 5 and later, MarkLogic Server also requires them. The following works in 4.2, but throws a syntax error in MarkLogic 5 and later:

```
<a href={"link"}/>
```

If you have code that uses this pattern, you will need to rewrite to use quote marks. You can make those changes in 4.2 if you like, as they work in 4.2 as well. For example, the following works in both 4.2 and MarkLogic 5 and later, and produces the same result in MarkLogic 5 and later as the previous code does in 4.2.

```
<a href="{"link"}"/>
```

4.6.2 repair-none Option of xdmp:unquote Throws Exception With Multiple Nodes

The `repair-none` option (which is the default for the `1.0` and `1.0-ml` XQuery dialects) throws an exception if the string to parse is not valid XML. In MarkLogic 7, it is a little more strict than in 4.2, and if the string represents multiple root nodes, then it throws an exception. The following throws an exception in MarkLogic 5 and later, but returns two document nodes in 4.2:

```
xdmp:unquote('<a/><b/>')
```

If you have code that relies on the 4.2 behavior, you will need to rewrite it (for example, by breaking it into multiple calls to `xdmp:unquote` or by using the `repair-full` option).

4.6.3 XCC/J AutoCommit Methods No Longer Available

The previously deprecated XCC `Session.setAutoCommit` and `Session.getAutoCommit` methods are no longer available in MarkLogic 5 and later. If you have code that relies on these methods, you must rewrite it to use the new `Session.setTransactionMode` and `Session.getTransactionMode` methods.

4.6.4 Post-Commit Triggers Now Execute on the D-Node

In 4.2, the module spawned from a post-commit trigger is evaluated on the node that initiated the query that caused the trigger (that is, on the evaluator node, also known as the e-node). In MarkLogic 5 and later, the module spawned from a post-commit trigger is evaluated on the data node (d-node) that stores the forest data for the triggering document. This ensures that post-commit triggers for documents participating in distributed transactions (XA transactions) will fire properly after the distributed transaction is committed.

In most cases, this change will not cause any incompatibilities, but there is potential for incompatibilities in the following cases:

- If the d-node is in a different group than the e-node, and if the d-node expanded tree cache is set to very low values, then it is possible for the post-commit trigger code to fail with an expanded tree cache full exception. If this happens, the expanded tree cache setting might need to be increased for the d-node group.
- If your trigger action code is stored in the filesystem under the `Modules` directory, you must ensure that the code is there for all of the nodes in the cluster.

4.6.5 XCC Queries That Fetch XML Documents Return Document Nodes

In MarkLogic 5 and later, XML documents returned by XCC queries return the document node in the `ResultItem`. Previously, such queries returned the root element node in the `ResultItem`. For example, in MarkLogic 7 if a `ResultItem` represents an XML document then `ResultItem.getItem()` in Java or `Resultitem.Item()` in C# returns an `XdmDocument` object. In previous releases, an `XdmElement` object is returned.

For example, in previous releases, the following code prints the name of the root element of an XML document:

```
...
import com.marklogic.xcc.types.XdmNode;
import org.w3c.dom.Node;

public static void main(String[] args) throws Exception {
    ...
    Request request =
        session.newAdhocQuery("fn:doc('somedoc.xml')");
    ResultSequence rs = session.submitRequest(request);
    ResultItem item = rs.next();

    Node node = ((XdmNode)item.getItem()).asW3cNode();
    System.out.println(node.getNodeName());
    ...
}
```

To achieve the same effect in MarkLogic 7, use `org.w3c.dom.Document.getDocumentElement`:

```
...
import com.marklogic.xcc.types.XdmDocument;
import org.w3c.dom.Document;

public static void main(String[] args) throws Exception {
    ...
    Request request =
        session.newAdhocQuery("fn:doc('somedoc.xml')");
    ResultSequence rs = session.submitRequest(request);
    ResultItem item = rs.next();

    Document doc = ((XdmDocument)item.getItem()).asW3cDocument();
    System.out.println(doc.getDocumentElement().getNodeName());
```

```
    ...
}
```

4.6.6 Flexible Replication Database Need an Update to their Configuration

If you are using Flexible Replication in 4.2, any database that is being replicated needs a minor configuration update. This configuration update adds a new range index and will therefore trigger a reindex on the database, so it is preferable to do this before the MarkLogic 5 and later reindexing occurs. To update the Flexible Replication setup for a database, run the following for each database in which you have Flexible Replication configured.

```
xquery version "1.0-ml";

import module namespace flexrep =
  "http://marklogic.com/xdmp/flexible-replication"
  at "/MarkLogic/flexrep.xqy";
import module namespace admin = "http://marklogic.com/xdmp/admin"
  at "MarkLogic/admin.xqy";

(:
   This script is for the "Documents" database: substitute the name of
   your database in which Flexible Replication is configured.
:)
admin:save-configuration(
  flexrep:configure-database(
    admin:get-configuration(),
    xdmp:database("Documents")))
```

4.6.7 Upgrading 4.2 Custom Plugins to MarkLogic 7

The directory where Information Studio looks for its plugins has changed. In 4.2, the plugins were in the system plugin directory. In MarkLogic 7, they are under the directory show in Plugin Directory in the *Information Studio Developer's Guide*.

If you have plugins created in MarkLogic Server 4.2, you must move them from the old directory:

```
<marklogic-dir>/Plugins
```

to the new directory:

```
<marklogic-dir>/Assets/plugins/marklogic/appservices
```

For details on plugins in Information Studio, see Information Studio Plugin Framework in the *Information Studio Developer's Guide*.

4.6.8 infodev:filesystem-walk $function Parameter Requires a Different Signature

The signature for the function that you pass into the `infodev:filesystem-walk` function in MarkLogic 5 and later has a different signature from 4.2. In MarkLogic 5 and later, the first argument of the process function signature must be a `node()?` instead of a `node()`. The signature for the `$function` parameter must now be as follows:

```
declare function my:function(
        $document as node()?,
        $source-location as xs:string,
        $ticket-id as xs:string,
        $policy-deltas as element(info:options)?,
        $context as item()?)
    as empty-sequence()
```

If you have code that uses `infodev:filesystem-walk`, you must modify the function that is referenced in the `$function` argument to match this signature; that is, you must change the first argument of the process function to be of type `node()?` instead of `node()`.

4.6.9 Some Samples Have Moved to developer.marklogic.com

In MarkLogic 5 and later, the `<marklogic-dir>/Samples` directory no longer contains the alerting sample application, the cq application (although MarkLogic 5 and later includes Query Console, which is installed on port 8000 as part of the installation or upgrade process), the heatmaps sample application, and the pairs sample application. Those applications are now available on developer.marklogic.com.

4.6.10 Docs App Server is Now Application Services App Server

MarkLogic 5 and later includes extended Application Services features. To accommodate those features, the Docs App Server that existed in previous release on port 8000 is renamed to App Services. Additionally, what was previously the App Services App Server on port 8002 is now the Manage App Server, and services the Management API, a REST API that drives several management and monitoring features in MarkLogic 5 and later.

The MarkLogic 5 and later upgrade attempts to make these changes to your configuration. In most cases, there are only the MarkLogic-installed application running on these ports, and the upgrade will add all of the new MarkLogic 5 and later Application Services functionality. If you do have other applications running on these ports, however, depending on how you have things configured, the App Server configuration for those applications might change, and you would therefore need to restore that functionality by created another App Server on a different port. For details on the upgrade and on the MarkLogic 5 and later Application Services App Server settings, see Prerequisites for Application Services Portion of the Upgrade in the *Installation Guide*.

4.6.11 Third Parameter of search:remove-constraint is Now Required

The `search:remove-constraint` function takes an options node as a third parameter. In MarkLogic 5 and later, the options node parameter is required. In 4.2, it was optional and it defaulted to the default options node. The change is because the default options do not include any constraints, and you can therefore not perform any useful actions with this function using the default options node. If you have code that uses the 2-parameter version of the function, you must rewrite that code to use the 3-parameter version and pass in an options node.

4.6.12 mapreduce.marklogic.output.batchsize No Longer Controls Transaction Size

As of MarkLogic Server version 5.0-3, the meaning of the MarkLogic Connector for Hadoop configuration property `mapreduce.marklogic.output.batchsize` changed from controlling transaction size to controlling the number records per request. For details, see Controlling Transaction Boundaries in the *MarkLogic Connector for Hadoop Developer's Guide*.

5.0 Other Notes

This section provides the following information about MarkLogic Server:

- Memory and Disk Space Requirements
- Compatibility with XQuery Specifications
- XQuery Extensions
- Documentation
- Browser Requirements
- Support

5.1 Memory and Disk Space Requirements

MarkLogic Server requires at least 512 MB of system memory.

The first time it runs, MarkLogic Server automatically configures itself to the amount of memory on the system, reserving as much as it can for its own use. If you need to change the default configuration, you can manually override these defaults at a later time using the Admin Interface.

MarkLogic recommends the following two guidelines for server sizing:

- Configure your server with 1 GB of physical memory for every 16 GB of source content you expect to manage.
- Configure your server with at least one CPU (or core) per 100 GB of source content.

Pragmatically, we recommend running most configurations with a minimum of two CPUs (or two cores).

MarkLogic Server requires 1.5 times the disk space of the total forest size. Specifically, each forest on a filesystem requires its filesystem to have at least 1.5 times the forest size in disk space (or , for each forest less than 32GB, 3 times the forest size) when the `merge max size` database merge setting is set to the default of 32GB. This translates to approximately 1.5 times the disk space of the source content after it is loaded. For example, if you plan on loading content that will result in a 200 GB database, reserve at least 300 GB of disk space. The disk space reserve is required for merges. *

It is critical for swap space to be properly configured on your system according to the recommendations for your platform, as described in Memory, Disk Space, and Swap Space Requirements in the *Installation Guide*.

For more details about memory, disk, and swap requirements, see Memory, Disk Space, and Swap Space Requirements in the *Installation Guide*.

* You need at least 2 times the `merge max size` of free space per forest, regardless of the forest size. Therefore, with the default `merge max size` of 32GB, you need at least 64GB of free space. Additionally, if your journals are not yet created, you need 2 times the journal size of free disk space (if the journal space is not yet allocated). Therefore, to be safe, you need (with the default `merge max size` and a 2G journal size) at least 68GB of free space for each forest, no matter what size the forest is.

5.2 Compatibility with XQuery Specifications

This release implements the XQuery language, functions and operators specified in the W3C XQuery 1.0 Recommendations:

- http://www.w3.org/TR/xquery/
- http://http://www.w3.org/TR/xquery-operators/

Additionally, there is backwards compatibility with the May 2003 version of the XQuery 1.0 Draft specification used in MarkLogic Server 3.2 and previous versions. For details on the XQuery implementation in MarkLogic Server 4.1, including the three different dialects supported, see the *XQuery and XSLT Reference Guide*.

5.3 XQuery Extensions

Working within the W3C XQuery 1.0 Recommendation, MarkLogic has created a number of language extensions enabling key functionality not supported in the current release of the language specification. These extensions provide transactional update capabilities, assorted search and retrieval features, various data manipulation functions, and administrative tools.

The extensions, as well as the XQuery standard functions, are documented at http://developer.marklogic.com.

5.4 Documentation

MarkLogic Server includes the following documentation, available through the developer web site at http://developer.marklogic.com/:

Documentation	Description
MarkLogic XQuery and XSLT Function Reference	API documentation for the MarkLogic built-in and module extensions to the XQuery standard functions, as well as API documentation for the W3C functions implemented in MarkLogic Server.
Getting Started with MarkLogic Server	A quick, step-by-step overview of how to get up and running with MarkLogic Server.
Installation Guide	Provides procedures for installing MarkLogic Server.
Release Notes	Contains a summary of new features, upgrade compatible information, and known issues.
Application Developer's Guide	Provides procedures, methodologies, and conceptual information about general MarkLogic Server application development tasks.
Search Developer's Guide	Provides procedures, methodologies, and conceptual information about search-based application development tasks.
Java Application Developer's Guide	Provides procedures, methodologies, and conceptual information about developing MarkLogic Server applications using the Java API.
XCC Developer's Guide	An overview of the what you can do with the XCC libraries, examples of how to use XCC, and an overview of the sample applications included with XCC.
MarkLogic Connector for Hadoop Developer's Guide	Provides information on the MarkLogic Connector for Hadoop, a Java library to help you build applications that combine MarkLogic Server and Hadoop map-reduce jobs.
REST Application Developer's Guide	Provides information on administration of and application development using the MarkLogic REST API.
Semantics Developer's Guide	Provides procedures, methodologies, and conceptual information about semantic application development tasks and MarkLogic SPARQL and triple support.

Documentation	Description
Administrator's Guide	Provides procedures for administrative tasks such as creating servers, creating databases, backing up databases, creating users, setting up your security policy, and so on.
Scripting Administrative Tasks Guide	Provides information on writing code to script various administrative tasks such as creating and modifying databases, App Servers, and so on.
Database Replication Guide	Provides information on database replication, useful for disaster recovery scenarios.
Flexible Replication Guide	Provides information on Flexible Replication, useful for information sharing from one database to another.
Monitoring MarkLogic Guide	Provides information on monitoring MarkLogic Server, including using the built-in monitoring tools and integrating with external tools such as Nagios and HP Operations Manager.
MarkLogic Connector for SharePoint® Administrator's Guide	Documentation for the MarkLogic Connector for SharePoint®, which allows you to mirror documents from a Microsoft SharePoint repository in MarkLogic Server.
XQuery and XSLT Reference Guide	A condensed overview of the XQuery language, including information on the three XQuery dialects in MarkLogic Server. This book does include some syntax information, although it is primarily intended as in introduction and quick-reference to the language, not as a comprehensive reference.
Content Processing Framework Guide	Provides an introduction to the Content Processing Framework and procedures for installing the default content processing framework.
Query Performance and Tuning Guide	Provides performance-related information that is useful to application developers and administrators.
Scalability, Availability, and Failover Guide	Provides information on large-scale system architecture, clustering, availability, and details on setting up shared-disk and local-disk failover.
Understanding and Using Security Guide	Provides information on the role-based security model in MarkLogic Server.
MarkLogic Server on Amazon EC2 Guide	Information about running MarkLogic Server in an EC2 environment.

Documentation	Description
Query Console User's Guide	Provides step-by step information on using Query Console, a tool to create and run arbitrary XQuery code.
Loading Content Into MarkLogic Server Guide	Provides procedures, methodologies, and conceptual information about loading content into MarkLogic Server. Includes an overview of ingestion techniques available using XQuery, Java, REST, .NET, and the MarkLogic Content Pump (mlcp).
SQL Data Modeling Guide	Provides information on how to use MarkLogic's SQL interface, including the creation of relational schemas and views.
Messages and Codes Reference Guide	A reference guide to MarkLogic Server and MarkLogic Application Services error and log messages.
MarkLogic REST API Reference	API documentation for the REST API.
Java Client API Documentation	API documentation for the MarkLogic Java Client API.
XCC Javadoc and .NET C# API Documentation	API documentation for the MarkLogic XML Contentbase Connector for Java API (XCC/J) and .NET XCC C# API documentation.
MarkLogic Hadoop MapReduce Connector API	API documentation for the MarkLogic Hadoop MapReduce Connector.
C++ UDF API Reference	API documentation for the C++ User Defined Function (UDF) API.
Application Builder Developer's Guide	Provides step-by-step information on using Application Builder to build a search application, and also provides information on customizing applications built with Application Builder.
Information Studio Developer's Guide	Provides step-by-step information on using Information Studio to load and transform content.

XQuery language documentation is provided through the W3C working group drafts specified in "Compatibility with XQuery Specifications" on page 57. Sample code is provided through the demo server at http://localhost:8000/, which is automatically installed as part of the MarkLogic Server installation process. Additionally, there are many samples available on the MarkLogic developer site (http://developer.marklogic.com).

XQuery language extensions specific to MarkLogic Server are documented online in the *MarkLogic XQuery and XSLT Function Reference*. Example code snippets are provided as part of that documentation. The Admin Interface provides a large-scale example of complex XQuery programming, using many of the MarkLogic Server XQuery language extensions.

The Admin Interface includes built-in help screens that explain the purpose of the various controls and parameters in the Admin Interface.

Known bugs are documented online as we find them or as they are reported to us. See http://support.marklogic.com (supported customers only) for more details.

5.5 Browser Requirements

The Admin Interface, Application Builder, the applications generated with Application Builder, and the other GUI tools (Query Console, Information Studio, and so on) are certified on Internet Explorer 9 on Windows, Firefox 41 on Windows and Mac OS, and Chrome 46 on Windows and Mac OS. Built applications are also certified on Internet Explorer 10 on Windows 8. Other browser/platform combinations may work but are not as thoroughly tested.

5.6 Support

MarkLogic provides technical support according to the terms detailed in your Software License Agreement. For evaluation licenses, MarkLogic may provide support on an “as possible” basis.

For registered customers, we invite you to visit our support website at http://support.marklogic.com to access our full suite of documentation and help materials. For all customers, visit the MarkLogic Developer site at http://developer.marklogic.com, which includes full product documentation, downloads, and developer community open-source projects.

If you have questions or comments, you may contact MarkLogic Technical Support at the following email address:

support@marklogic.com

If reporting a query evaluation problem, be sure to include the sample XQuery code.

Combined Product Notices

MarkLogic Server 7.0-6 and supporting products.
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