Configuration Management

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Introduction

Motivation

- What is the current configuration of this cluster?
- Is this cluster the same as that one?
  - How are they different?
  - How can I make them the same?

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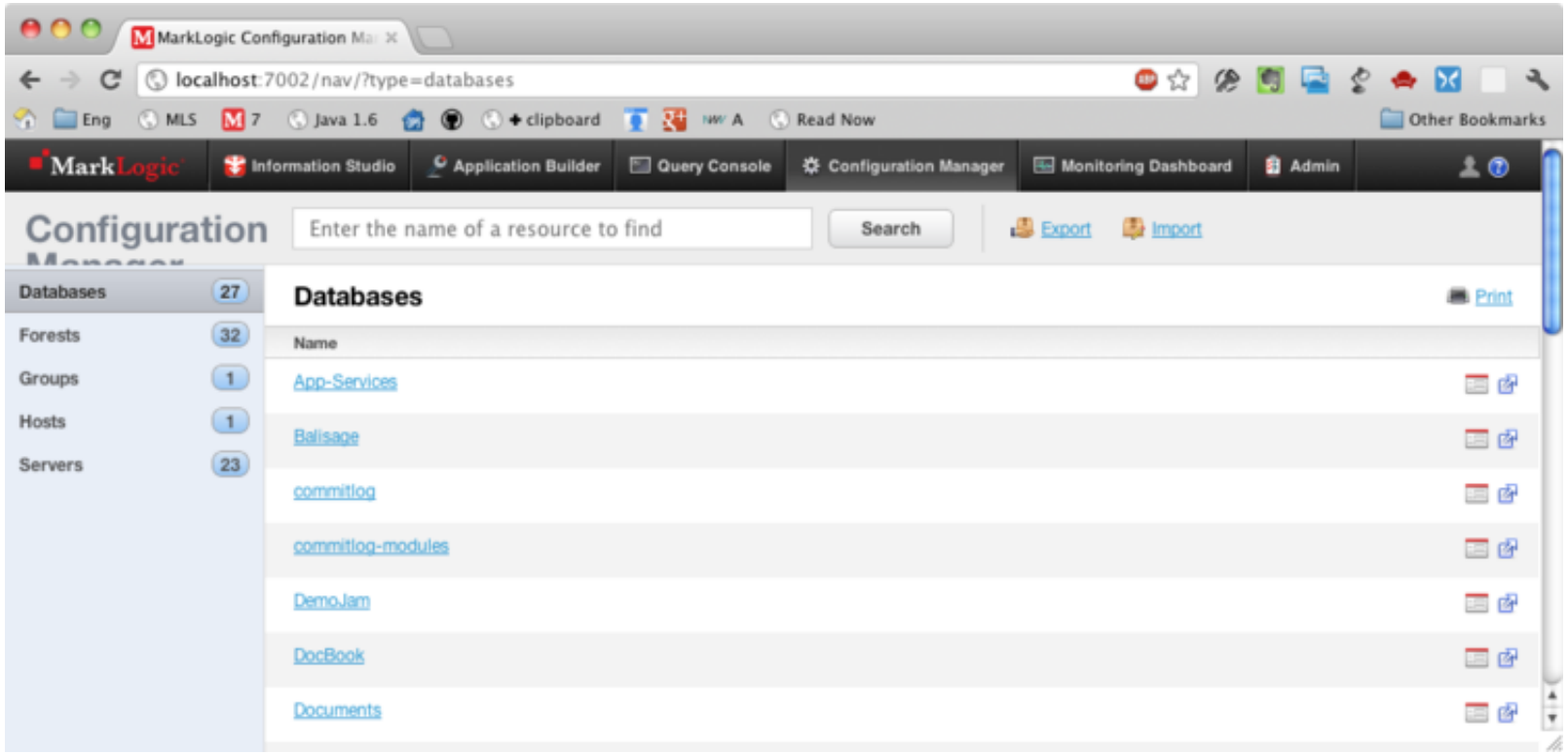
Configuration Management

- Read-only configuration
  - What is the configuration of this cluster?



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Configuration Management

- More streamlined than the Admin UI
- Does not require "admin" privileges, users can be granted permission to view the configuration without being able to change it.
- For admins, the Admin UI is just a click away.

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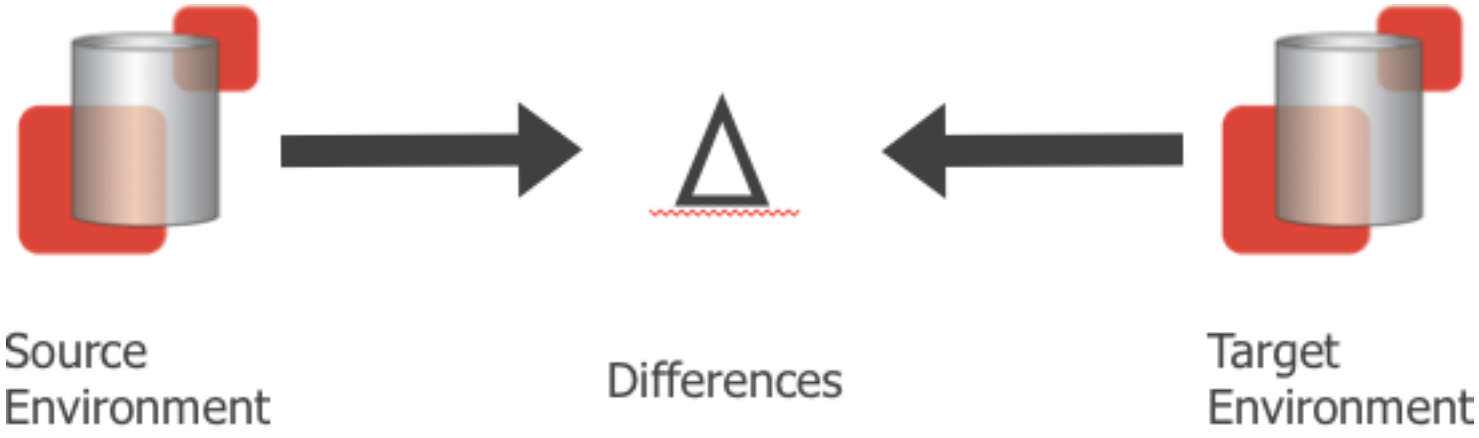
Packaging

- Do the source and target environments differ? How can I make them the same?
- Source environment: certified master, developer system, staging cluster
- Target environment: additional clusters, staging cluster, production cluster



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What is it?

- A targeted solution to synchronize database and application server settings.
- A shared vocabulary to communicate configuration artifacts
- A set of tools to extract, compare, and apply changes:
  - A Browser UI
  - A REST API
  - An XQuery API

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Benefits

- Better integration with existing tools and practices
- Faster, more predictable deployments
- Shorter downtime windows
- Fewer "one off" errors
- More efficient communication between devs, ops, and support

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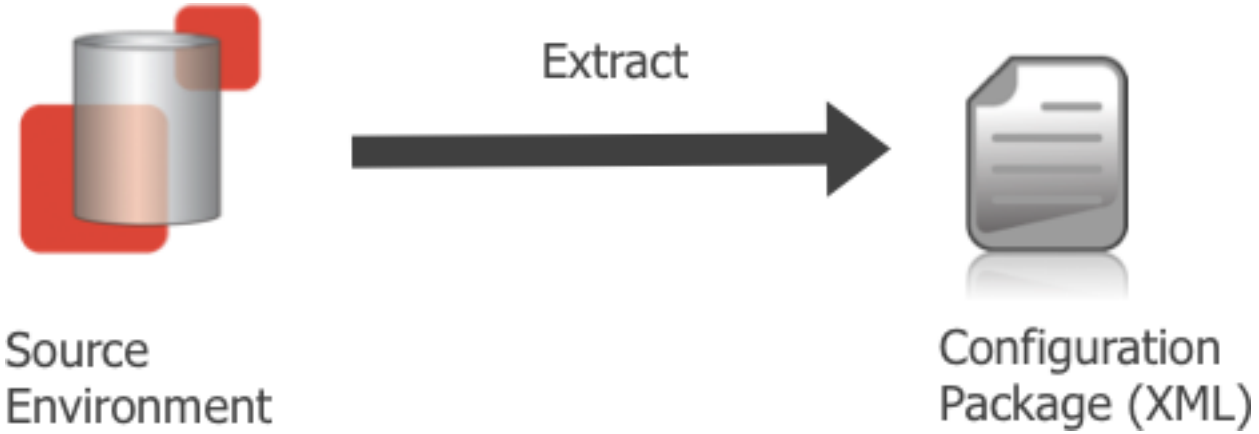
Configuration push (1/2)

- Extract relevant configuration from source



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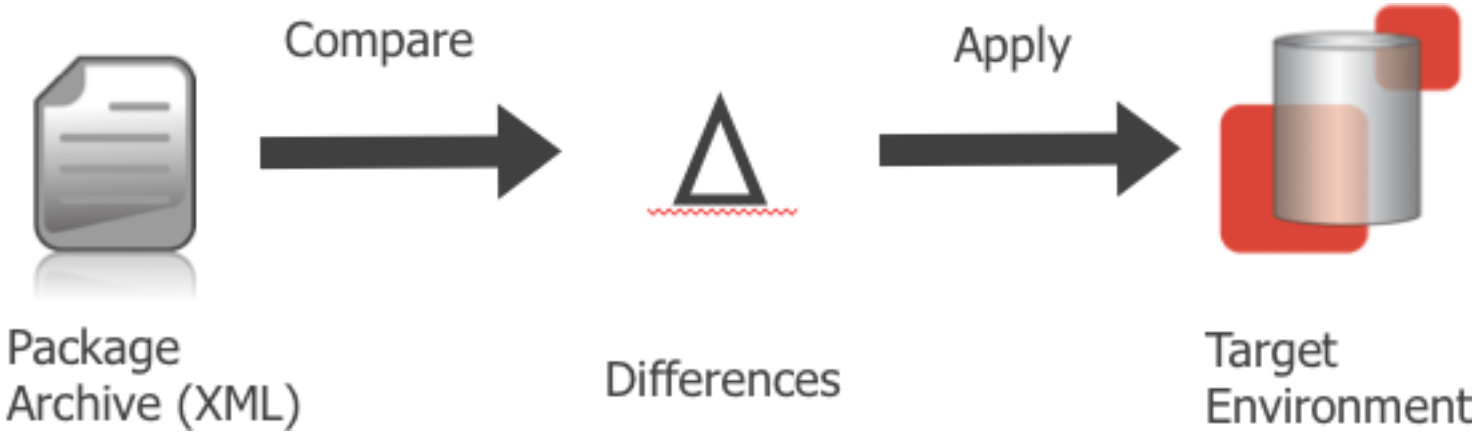
Configuration push (2/2)

- Extract relevant configuration from source
- Compare against target
- Update target configuration



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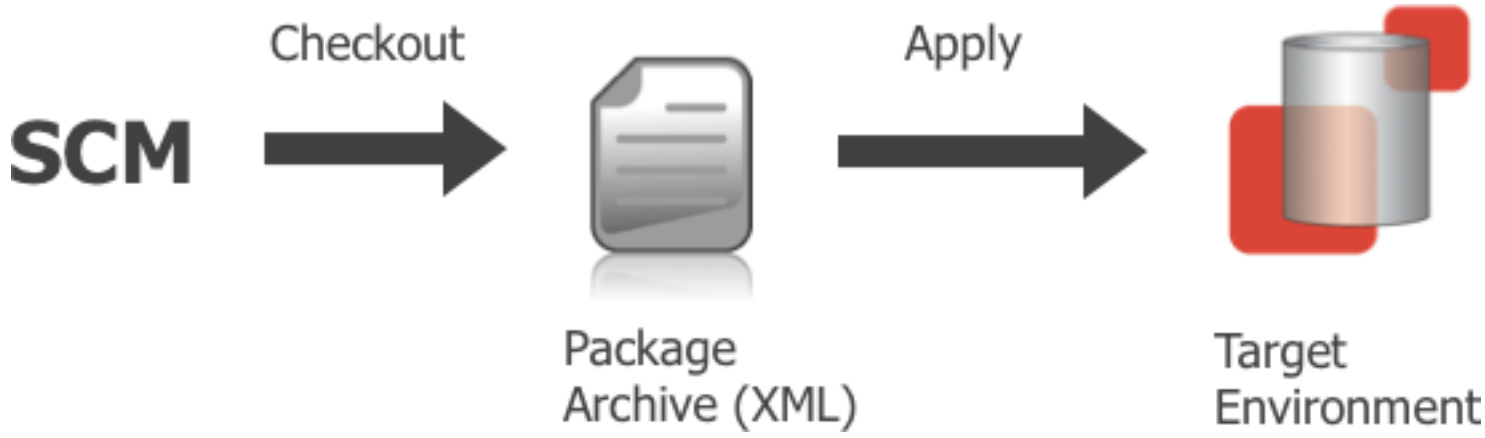
Initial setup

- Developer setting up a new dev box



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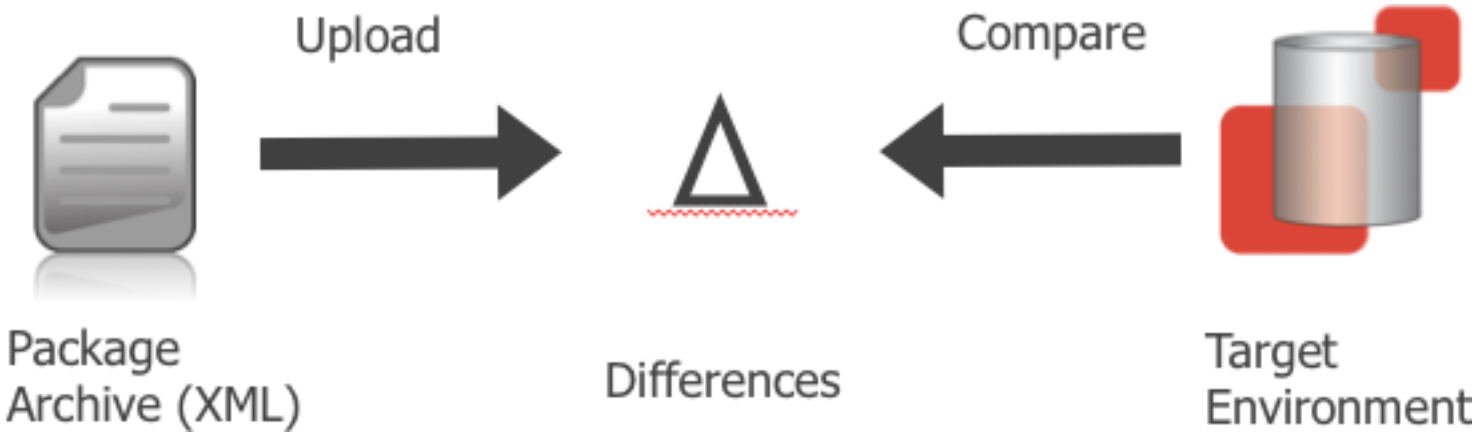
Auditing production changes

- "Has something changed on the production server?"



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A few words about scope

- Handles configuration of databases and application servers only.
- Relies on other tools to coordinate code and data
- Doesn't manage relationships (users, schemas, etc.)

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Browser UI

Demo

- Initial install
- Get updated package
- Compare updated package on target machine
- Apply changes

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REST API

Download a package

```
GET http://localhost:8002/manage/v1/list/package?
    database=dbname&appserver=group/servername
  package.xml
```

Package XML:

```
<package xmlns="http://marklogic.com/package">
  <package-database>
    <metadata>
      <package-version>1.0</package-version>
      …</metadata>
    <name>Documents</name>
    <package-database-properties>
      <enabled>true</enabled>
      <language>en</language>
      <stemmed-searches>basic</stemmed-searches>…
```


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Compare a package

```
POST package.xml
  http://localhost:8002/manage/v1/package/compare
```

"Delta" XML:

```
<pkg:package-diff xml:lang="en"
     xmlns:pkg="http://marklogic.com/package">
   <package-database-diff
      xmlns="http://marklogic.com/package/databases">…
      <package-database-properties>…
         <uri-lexicon>
            <pkg:delta>
               <pkg:del>false</pkg:del>
               <pkg:add>true</pkg:add>
            </pkg:delta>
         </uri-lexicon>…
```


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Install a package

```
POST package.xml
  http://localhost:8002/manage/v1/package/install
```

"Result" XML:

```
<result xmlns="http://marklogic.com/package">
  <ticket-id>/tickets/ticket/160…272</ticket-id>
  <result-status>COMPLETED</result-status>
  <result-event>PACKAGE_WRITTEN</result-event>
</result>
```


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XQuery API

The package API

```
import module namespace package
       = "http://marklogic.com/package/package"
       at "/MarkLogic/package/package.xqy";
```

- Public API contains all of the core functionality
  - `package:create`
  - `package:compare`
  - `package:install`
  - …
- Like the `admin:` API: create a package, then update it
- Comparison returns an XML document detailing the differences
- Applying a package updates the server configuration.

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Reverting a package

- If it all goes horribly wrong…

```
let $ticket := "/tickets/ticket/254882707490877156 7"
return
  package:revert($ticket)
```


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Q&A

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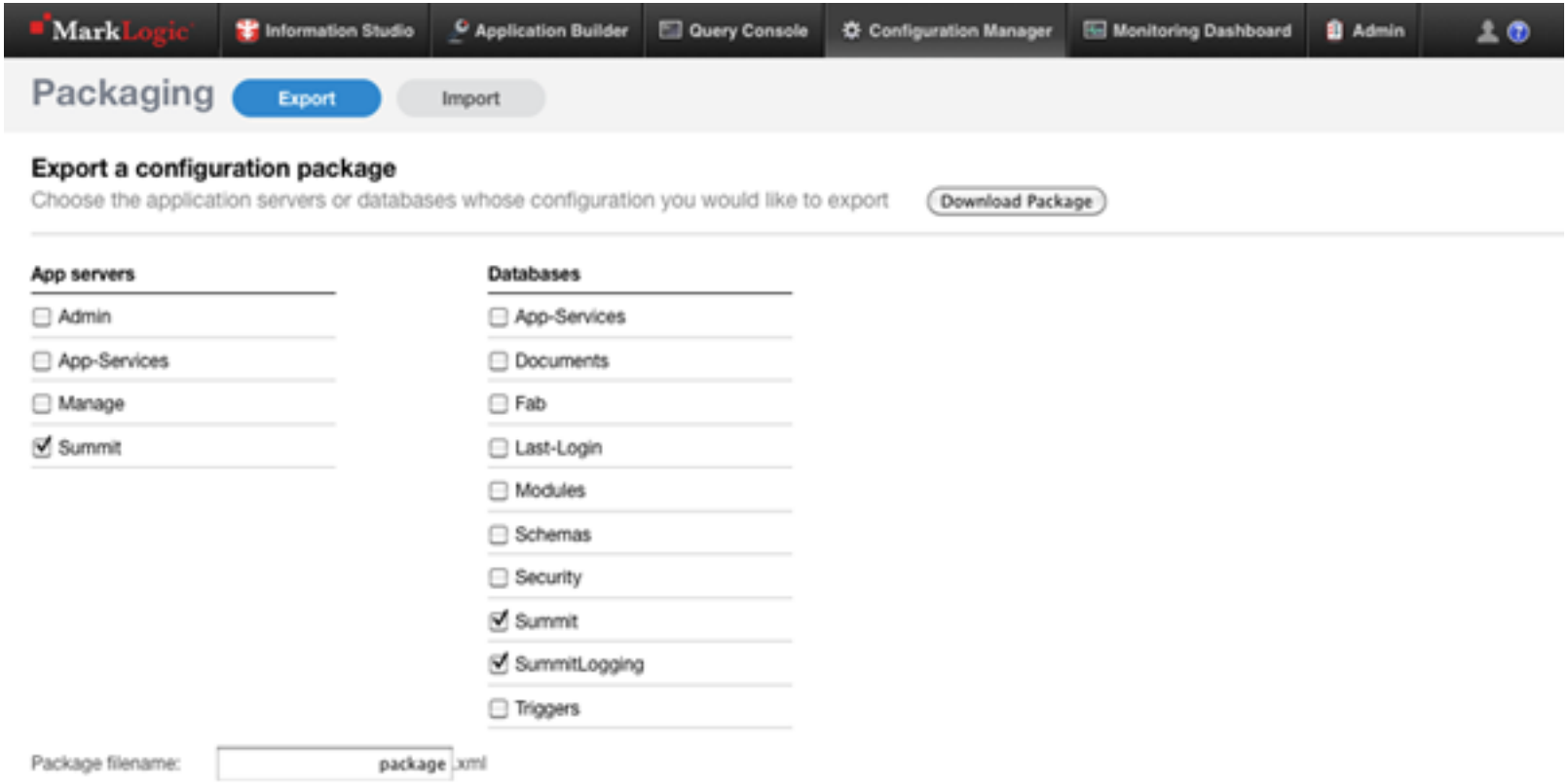
Appendixes

Creating a package



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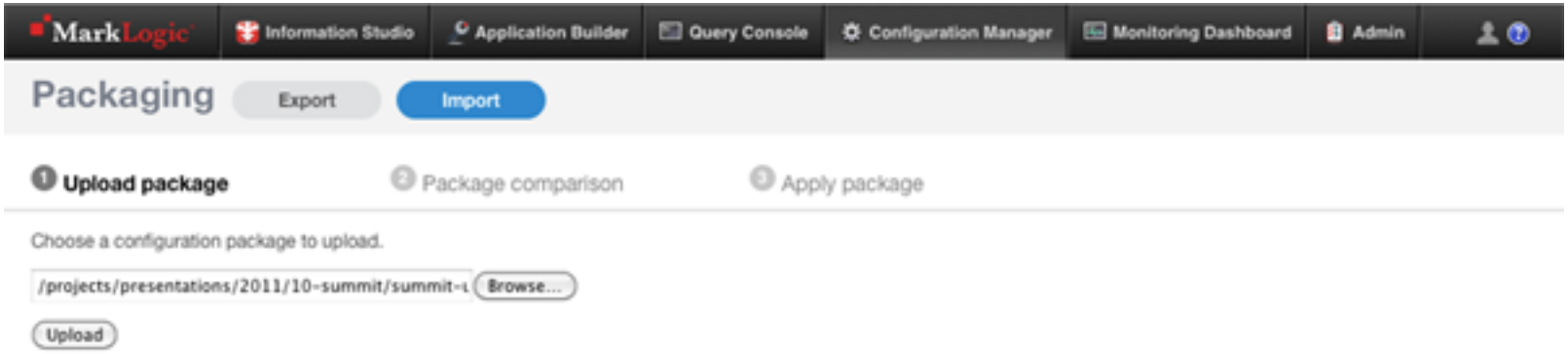
Uploading a package



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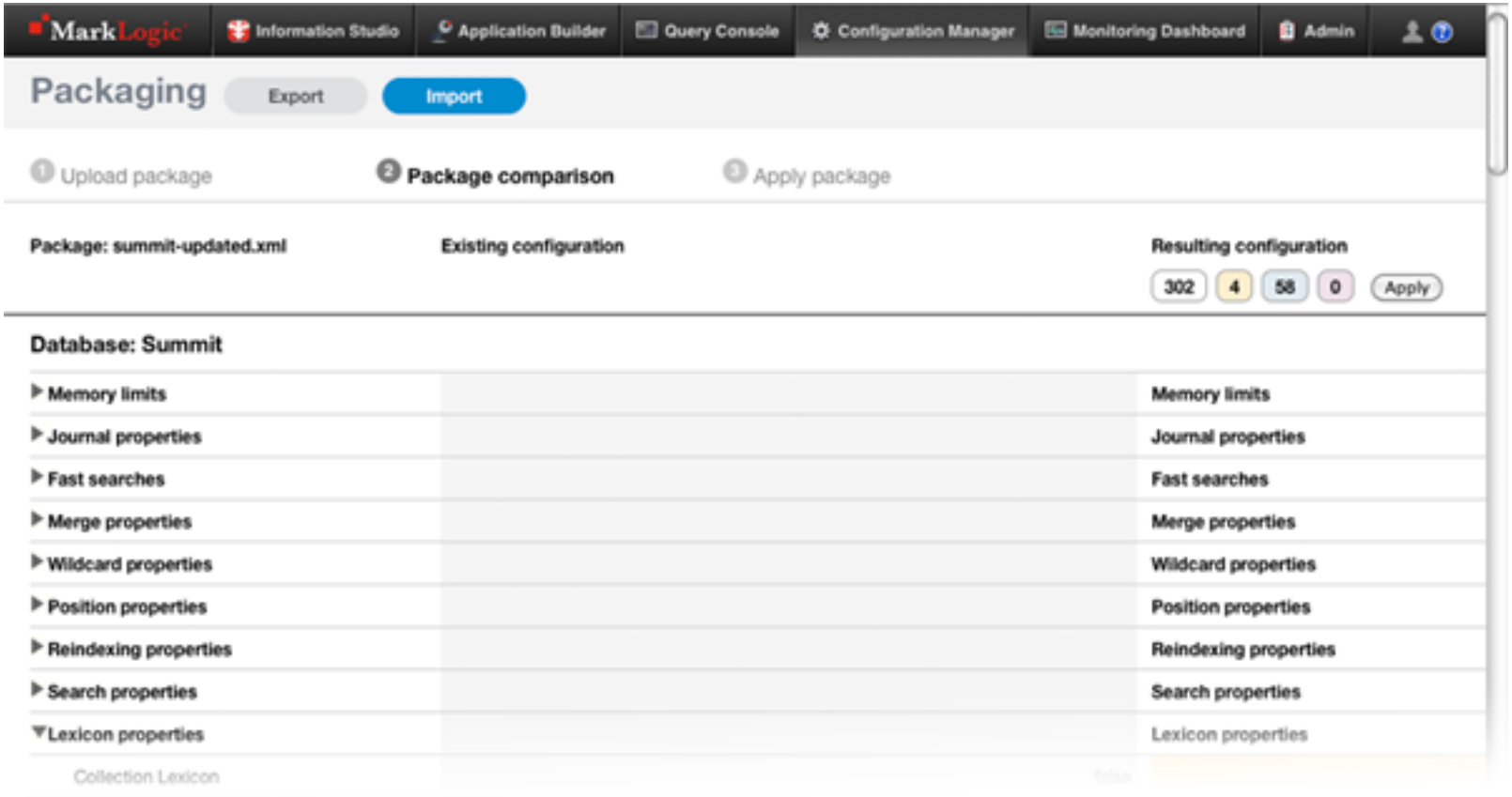
Comparing a package



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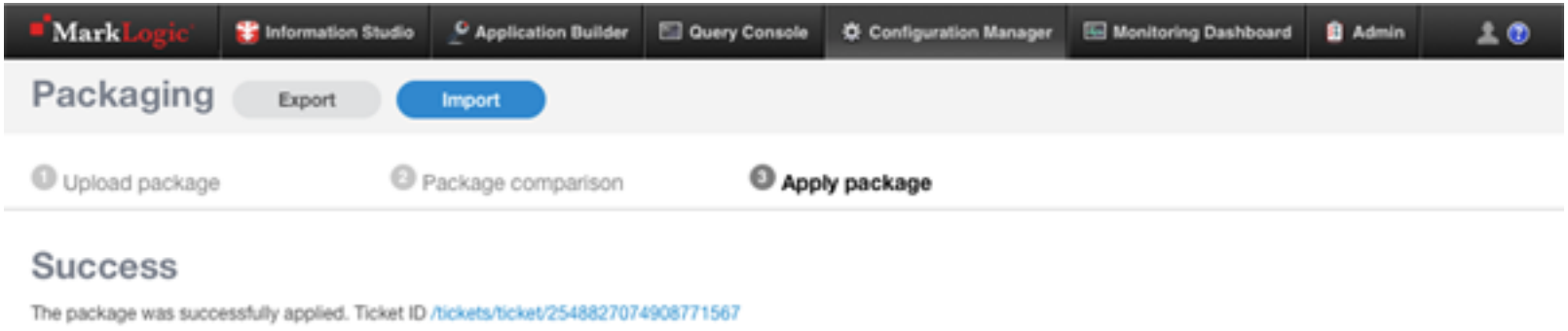
Applying a package



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Creating a package

- Like the `admin:` API: create a package, then update it

```
let $pkg := package:create()
let $pkg := pkg:add-database($pkg, "Summit")
let $pkg := pkg:add-database($pkg, "SummitLogging")
let $pkg := pkg:add-appserver($pkg, "Default", "Summit")
return
  $pkg
```


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Comparing a package

- Read the configuration off the current (target) machine
- Obtain the package XML from somewhere
- Compare the packages

```
let $target := package:create()
let $target := pkg:add-database($pkg, "Summit")
let $target := pkg:add-database($pkg, "SummitLogging")
let $target := pkg:add-appserver($pkg,
                    "Default", "Summit")

let $source := xdmp:document-load("…/package.xml")
let $errors := package:errors($source)
return
  if (empty($errors))
  then package:compare($source, $target)
  else …
```


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Applying a package

- If you're happy with the differences, you can install the package

```
let $source := xdmp:document-load("…/package.xml")
let $errors := package:errors($source)
return
  if (empty($errors))
  then package:install($source)
  else …
```


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Database properties

The following properties are part of a package:

- Fragment Roots
  - namespace/localname pairs
- Fragment Parents
  - namespace/localname pairs
- Merge Policy
  - Priority
  - Max size/min size/min ratio
  - Merge timestamp
  - Blackout periods
    - Type
    - Disable/limit
    - Priority
    - Days
    - Duration
- Scheduled Backups
  - Directory
  - Type

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Database properties
(Continued)

- Period
- etc.
- Element Range Indexes
  - Type, namespace/localname, collation, positions
- Attribute Range Indexes
  - Type, parent namespace/localname, namespace/localname, collation, positions
- Element Word Lexicons
  - Namespace/localname, collation
- Attribute Word Lexicons
  - Parent namespace/localname, namespace/localname, collation
- Word Query
  - Index settings
  - Include root
  - Includes
    - Namespace/localname, weight, attr namespace/localname, value
  - Excludes
    - Namespace/localname
- Fields

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Database properties
(Continued)

- Name
- Index settings
- Include root?
- Field range indexes
- Phrase-Throughs
  - Namespace/localname
- Phrase-Arounds
  - Namespace/localname
- Element-Word-Query-Throughs
  - Namespace/localname
- Geospatial Indexes
  - Element indexes
    - Namespace/localname, point format, positions
  - Element child indexes
    - Parent namespace/localname, namespace localname, point format, positions
  - Element pair indexes
    - Parent namespace/localname
    - Latitude namespace/localname
    - Longitude namespace/localname
    - Positions

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Database properties
(Continued)

- Element attribute pair indexes
  - Parent namespace/localname
  - Latitude namespace/localname
  - Longitude namespace/localname
  - Positions

The following properties are not part of a package:

- Forests
- Flexible Replication
- Database Replication
- Triggers
- Content Processing

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Common server properties

The following properties are part of a package:

- Server name
- Root
- Port
- Database
- Last login
- Address
- Backlog
- Threads
- Request timeout
- Keep alive timeout
- Max time limit
- Default time limit
- Pre-commit trigger depth
- Pre-commit trigger length
- Collation

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Common server properties
(Continued)

- Authentication
- Concurrent request limit
- Log errors
- Debug allow
- Profile allow
- Default XQuery version
- Output SGML character entities
- Output options

The following properties are not part of a package:

- Privilege
- Request blackouts
- SSL certificate template
- SSL hostname
- SSL ciphers
- SSL require client certificate
- Documents database
- Modules database

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Common server properties
(Continued)

- Last-login database

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HTTP server properties

The following properties are part of a package:

- Modules
- Display last login
- Session timeout
- Static expires
- Error handler
- URI rewriter

The following properties are not part of a package:

- Default user

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WebDAV server properties

The following properties are part of a package:

- Compute content length
- Session timeout
- Static expires

The following properties are not part of a package:

- Default user

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XDBC server properties

The following properties are part of a package:

- Modules
- Display last login

