

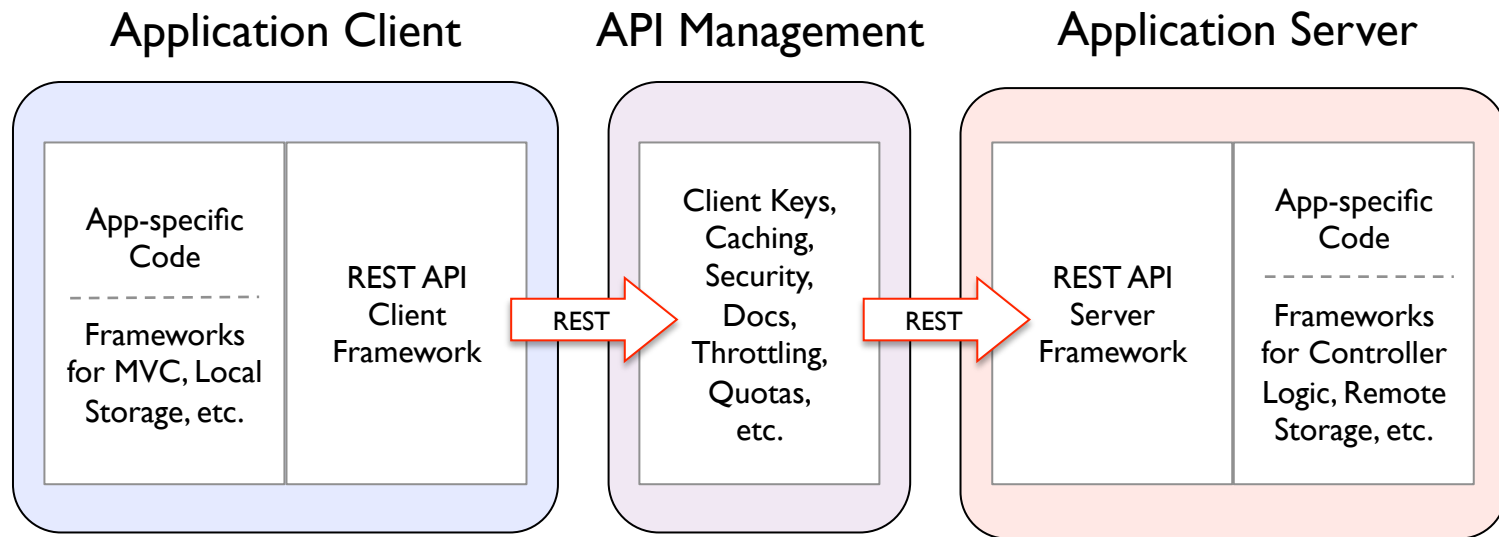
WRML

Web Resource Modeling Language

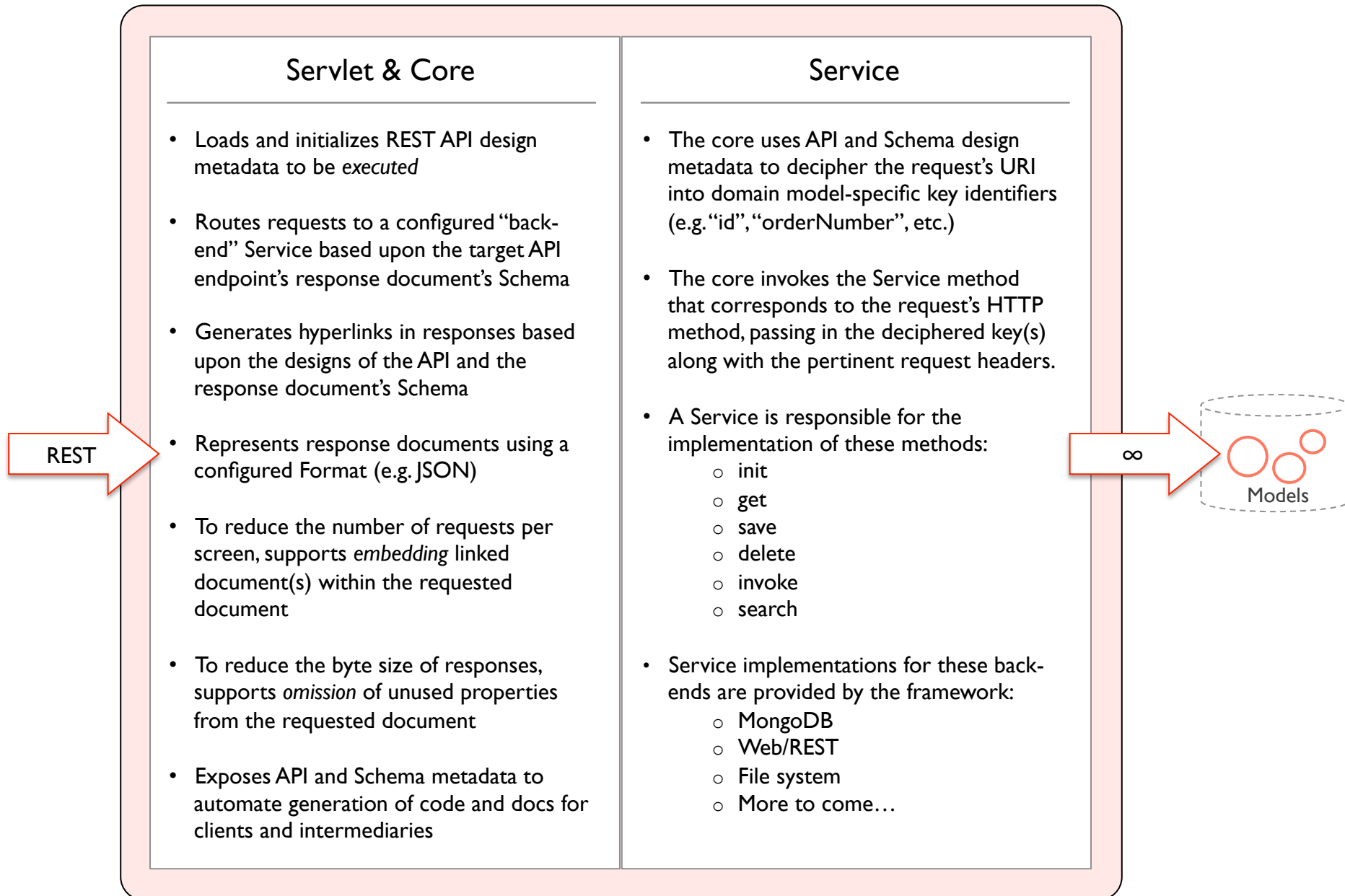
Design Notes



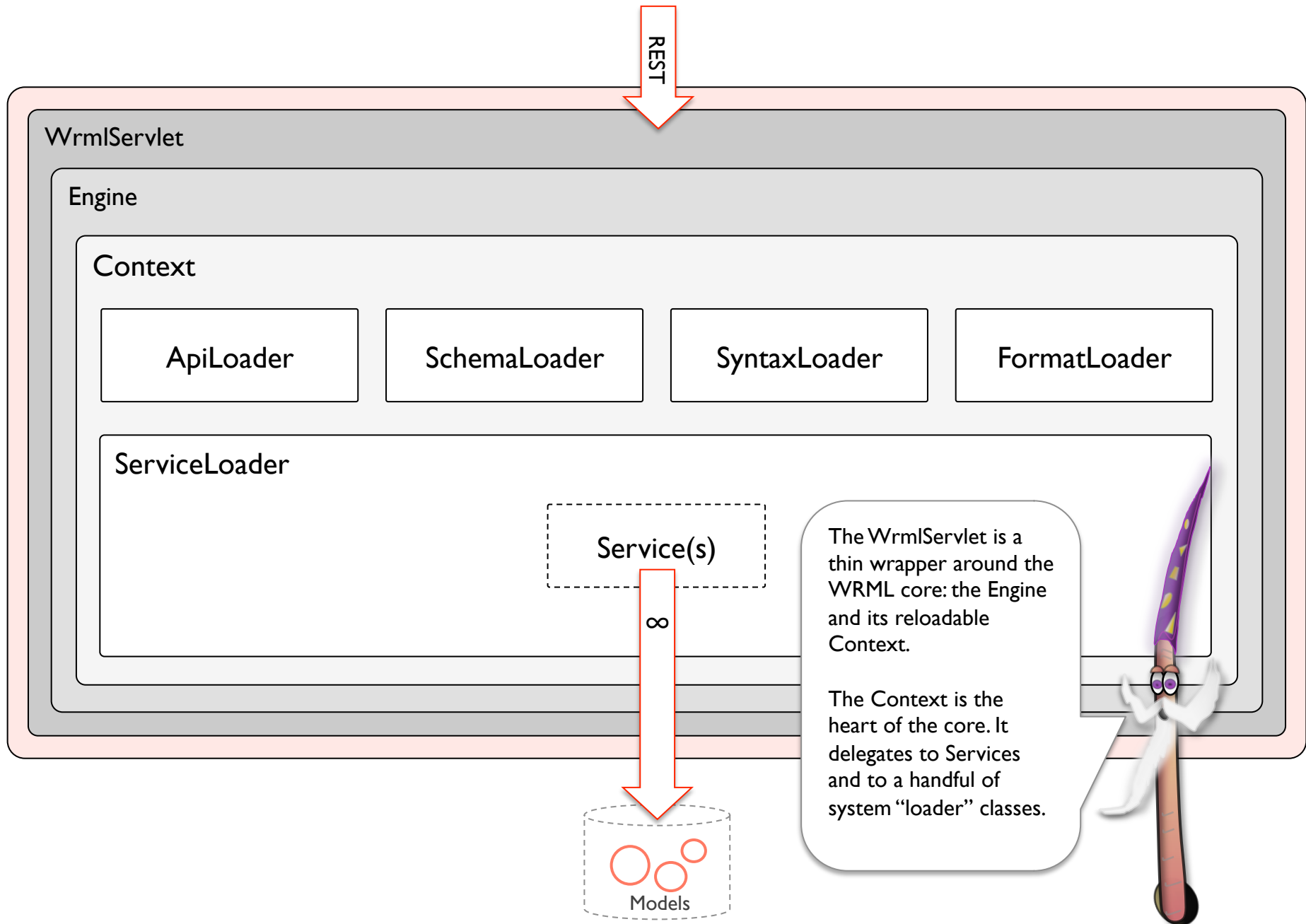
REST-Oriented Application Architecture



WRML Application Server Architecture



WRML Application Server Internals



ApiLoader

Context

ApiLoader

Load

Loads System Apis along with any configured Apis on start-up.

Schema



(System)

Player



Wizard



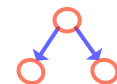
Compile

Interprets Apis and creates an ApiNavigator component for each one. The ApiNavigator data structure is optimized for execution.

Wizard
Api



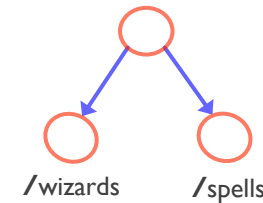
Wizard
ApiNavigator



Execute

Used for request routing and to decipher URIs into domain-specific identifiers.

Wizard ApiNavigator

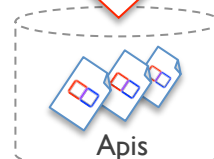


ServiceLoader

Gets Apis

Api Service

∞



Any Service can be configured to handle Api documents. Therefore, REST API configurations may be loaded from MongoDB, files, the Web, etc.

SchemaLoader

Context

SchemaLoader

Load

Loads System Schemas along with any configured Schemas on start-up.

Format



(System)

Player



Wizard



Compile

Interprets Schemas and creates a Prototype component for each one. The Prototype data structure is optimized for execution.

Wizard Schema



Wizard Prototype

Execute

Used for type identification, structural description, and model instance validation.

Wizard Prototype

Name	Type
wizardKey	“,” Text
guildId	# Integer
guild	⇒ Link

ServiceLoader

Gets Schemas

Schema Service

∞












Schemas

Any Service can be configured to handle Schema documents.

Type System

Schemas describe the structure for a “class” of Models. In this way, Schema are like O-O interfaces. Schema models are also a bit like: SQL table structures, XML DTDS, JSON or XML schemas, AVRO schemas, XLS templates, CMS content types, etc.

A Schema may declare any number of name-value slots, with the slot value type being one of the following primitives:

Value Type	Description	JSON Type	Java Type
 Boolean	Must be true, false, or null.	true or false	java.lang.Boolean
 Date	A date (with an optional time component).	string	java.util.Date
 Double	A double-precision 64-bit IEEE 754 floating point number.	number	java.lang.Double
 Integer	A 32-bit integer.	number	java.lang.Integer
 Link	A simple structure containing URI values for <i>href</i> and <i>rel</i> slots.	object	org.wrml.model.rest.Link
 List	A list of values of any single (non-List) type (Text, Integer, etc.).	array	java.util.List
 Long	A 64-bit integer.	number	java.lang.Long
 Map*	A mapping of Text keys to any single (non-Map) typed value.	object	java.util.Map
 Model	An instance of a Schema with a map containing its slot values.	object	org.wrml.model.Model
 Single Select	A special Text-based value that is selected from a fixed menu of possible choices.	string	java.lang.Enum
 Text	A sequence of zero or more Unicode characters.	string	java.lang.String

* See Issue: [WRML-300](#)

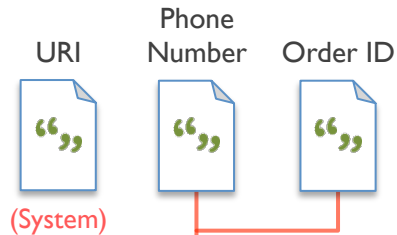
SyntaxLoader

Context

SyntaxLoader

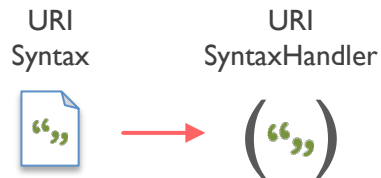
Load

Loads System Syntaxes along with any configured Syntaxes on start-up.



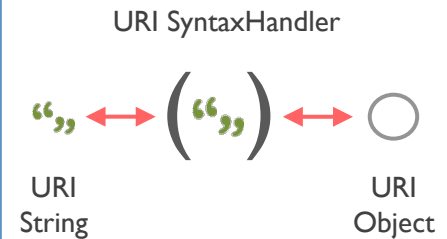
Map

Maps Syntaxes to configured SyntaxHandlers.



Execute

Parses and formats text to and from common object wrappers.

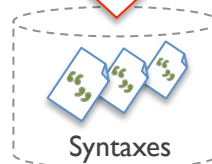


ServiceLoader

Gets Syntaxes

Syntax Service

∞



Any Service can be configured to handle Syntax documents.

FormatLoader

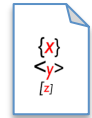
Context

FormatLoader

Load

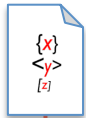
Loads System Formats along with any configured Formats on start-up.

JSON

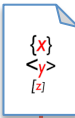


(System)

YAML



Avro



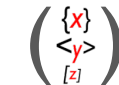
Map

Maps Formats to configured Formatters.

JSON
Format



JSON
Formatter



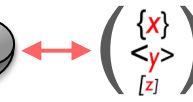
Execute

Writes and reads models to and from formatted output and input streams.

JSON Formatter



I/O
Stream



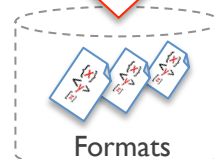
Model

ServiceLoader

Gets Formats

Format Service

∞



Formats

Any Service can be configured to handle Format documents.

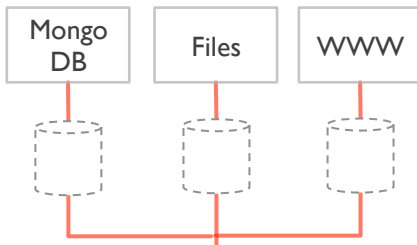
ServiceLoader

Context

ServiceLoader

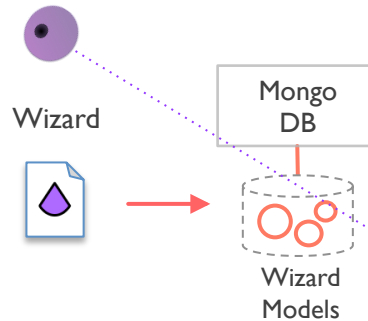
Load

Loads all configured Services on start-up.



Map

Maps configured Schema *URI patterns* to configured Services.

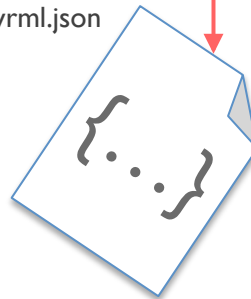


Execute

Services are used to implement the CRUD, search, and invoke operations for a set of models with a variety of Schemas.



wrml.json



URI patterns with wildcards are supported in the Schema-to-Service mapping so that “groups” of related Schemas may be handled by the same Service.

Service Interface

Context

ServiceLoader

Service

Init

Perform one-time initialization of the Service.



Get

Get a model based on the specified *Keys* and *Dimensions*.



Search

Get a set of models based upon the specified *SearchCriteria*.



Save

Save (PUT) the specified model.



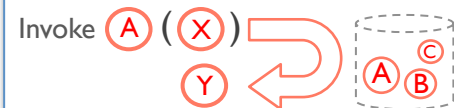
Delete

Delete a model based on the specified *Keys* and *Dimensions*.

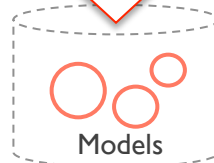


Invoke

Invokes a *functional* model with an (optional) parameter model.



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The *Keys* structure contains the requested URI, along with any deciphered, domain-specific identifiers.

The *Dimensions* structure contains the requested Schema URI, to identify the response type, along with any pertinent request header metadata (e.g. Locale).