WebSphere MQ IRI

Addressing Scheme

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1 Introduction

This document defines the format of an Internationalized Resource Identifier (IRI) scheme *[RFC3987]* for identifying addressable resources used in WebSphere MQ (WMQ).

In its simplest form, a WMQ IRI contains a representation of the name of Queue and Topic messaging resources.

The WMQ IRI has been created to enable interactions with WMQ resources. WMQ resource interactions may need a combination of connection information, resource destination information, and message property information (for example to put a persistent message to a queue). The WMQ IRI scheme defines a mechanism for specifying all of this information.

1.1 Applicability

The WMQ IRI is designed initially for use with the WMQ Service Definition *[WMQ-SERVICE],* for example, to identify WMQ queue and topics used by service requesters and service providers in a Service Oriented Architecture, so this IRI specification refers to properties defined in the *[WMQ-SERVICE]* specification.

The IRI scheme is also intended to be applicable in other circumstances when an IRI is needed to describe WMQ resources.

1.2 Requirements notation

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in *[RFC2119]* .

2 IRI Scheme Name

The name of the IRI scheme is *wmq*.

The namespace associated with this version of the specification is:
`http://www.ibm.com/xmlns/prod/wmq/iri/1.0`

3 Syntax of a “wmq” IRI

The following ABNF [RFC4234] describes the *wmq* scheme IRI syntax:

```
wmq-iri = "wmq:" [ "//" connection-name ] "/" wmq-dest ["?" parm *("&" parm)]
connection-name =  tcp-connection-name / other-connection-name
tcp-connection-name =  ihost [ ":" port ]
other-connection-name =  1*(iunreserved / pct-encoded)
wmq-dest =  queue-dest / topic-dest
queue-dest =  "msg/queue/" wmq-queue ["@" wmq-qmgr]
wmq-queue =  wmq-name
wmq-qmgr =  wmq-name
wmq-name =  1*48( wmq-char )
topic-dest =  "msg/topic/" wmq-topic
wmq-topic =  segment *( "/" segment )
segment =  1*(iunreserved / pct-encoded)
parm =  parm-name "=" parm-value
parm-name =  1*(iunreserved / pct-encoded)
parm-value =  *(iunreserved / pct-encoded)
wmq-char =  ALPHA / DIGIT / "." / "_" / %x2F / %x25 ; Encode “/” and “%”
ihost =        ; see [RFC3987]
port =         ; see [RFC3987]
iunreserved =  ; see [RFC3987]
pct-encoded =  ; see [RFC3986]
ALPHA = ; see [RFC4234]
DIGIT = ; see [RFC4234]
```

Note that *iunreserved*, *ihost*, and *port* are as defined in *[RFC3987]* , and *pct-encoded* is as defined in *[RFC3986]*.

4 IRI scheme semantics

The *wmq* scheme name and the *wmq-dest* resource identifier MUST be present in a *wmq* IRI.

The IRI scheme also allows for the inclusion of properties in the form of query parameters. Property names are always case-sensitive. The WMQ Service Definition *[WMQ-SERVICE]* document contains a detailed description of a set of these properties.

4.1 Mapping the IRI to WMQ Service Definition Properties

The following properties named in the WMQ Service Definition *[WMQ-SERVICE]* document are derived from particles in the IRI:

destinationName

The value of the *wmq-queue* or *wmq-topic* in the grammar above. This specifies the name of the WMQ queue or topic being addressed.

connectionName

Taken from the *connection-name* in the grammar above, this specifies the location of the WMQ resource being addressed. It is only used for WMQ client-binding connections.

4.2 Named Properties

The remaining properties described by the WMQ Service Definition *[WMQ-SERVICE]* document MAY be included in the IRI as query parameters in any order (following the '?' parameter-start indicator, and separated by '&'). If a property appears more than once in the IRI, then the value set by the last occurrence of the property MUST be used.

4.3 Custom properties

The set of IRI parameters is extensible. User-defined parameters may be supplied in the IRI, by specifying them as name=value query parameters like the set of well-known parameters. User-defined properties MUST be prefixed with the text '*usr*'.

5 Examples

5.1 Simple Queue Address

The following simple *wmq* IRI references a WMQ queue called "INS.QUOTE.REQUEST". The host machine and queue manager on which the queue is defined are not mentioned in this IRI and would need to be determined by the user of the IRI.

```
wmq:/msg/queue/INS.QUOTE.REQUEST
```

5.2 Qualified Queue Address

The following IRI references a WMQ queue called "INS.QUOTE.REQUEST" which is defined on a queue manager called "MOTOR.INS". The host machine and queue manager which the application connects to are not defined and would need to be determined by the user of the IRI. WMQ handles the routing of the message to the “MOTOR.INS” queue manager from the queue manager the application is connected to (assuming a route has been defined).

```
wmq:/msg/queue/INS.QUOTE.REQUEST@MOTOR.INS
```

5.3 Request/Response Service with Client-Bindings

The following IRI references the queues associated with a WMQ request/response application. The IRI includes WMQ client-binding connection information, and information about the qualities of service (i.e. persistence) of the messages.

This IRI tells a service requester that it can use a WMQ TCP client-binding connection to a machine called example.com on port 1415 and put persistent request messages to a queue called INS.QUOTE.REQUEST on queue manager MOTOR.INS. The targetAction property is specified to allow dispatching of the requests. The IRI specifies that the service provider will put replies to a queue called INS.QUOTE.REPLY on queue manager BRANCH452.

When an IRI like this one is used as part of a WMQ Service Definition message exchange, then the WMQ Service Definition *[WMQ-SERVICE]* specification defines default values for properties which are not specified in the IRI (like connection queue manager, correlation style etc.).

```
wmq://example.com:1415/msg/queue/INS.QUOTE.REQUEST@MOTOR.INS
       ?ReplyTo=msg/queue/INS.QUOTE.REPLY@BRANCH452
       &persistence=MQPER_NOT_PERSISTENT&targetAction=GetQuote
```

6 Encoding considerations

The characters used to encode the *queue-dest* must be limited to those characters allowed in a WMQ object name. That is: Uppercase A–Z; Lowercase a–z, Numerics 0–9; period (.); Underscore (_); Forward slash (/); and Percent sign (%). The characters '/', and '%' MUST be encoded using percent-encoding or a UCS character sequence as defined in [RFC3986].

7 Security Considerations

The following section describes security concerns which apply to the WMQ IRI based on the general concerns outlined in Section 7 of *[RFC3986]*.

7.1 Reliability and Consistency

WMQ resources are typically either created and configured manually by an administrator or automatically by a program, and can be deleted at any time. There is therefore no guarantee that a *wmq* address will reliably and consistently by associated with the same resource.

7.2 Malicious Construction

WMQ IRIs can contain parameters which determine how an application connects to a WMQ queue manager. For example the following connection properties defined in the WMQ Service Definition *[WMQ-SERVICE]* specification may be expressed as parameters in an IRI: "connectQueueManager", "connectionMode", "channelTableName", "channelTableLib", "channelName", and "connectionName".
If a malicious third party is able to alter these parameters then it will be able to redirect the connections made by any WMQ application which uses the modified IRI, potentially enabling the third party to reroute, eavesdrop on, or tamper with the messages which the applications send. Applications SHOULD therefore take steps to ensure that IRIs are communicated securely, and SHOULD only use them if they can trust their source.

8 Acknowledgements

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9 References

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