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The "active" URI scheme

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Abstract

A new URI scheme, "active", is defined. It allows processing results to be referenced uniquely and invariantly by compounding their dependencies into a URI.

Conventions used in this document

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 [RFC-2119](#) [1].

1. Description

In a declarative resource processing pipeline it is helpful for all resources, whether external or internal intermediate results, to be identified by URI. An `_active_` URI may uniquely specify the resulting resource of a process, such a URI can embody a processing specification and may be used as a request for a generative process.

This document defines a new URI scheme that allows specification of a generative resource process. The URIs are of the form:

```
active:<processURI>*(+<inputName>@<inputURI>)
```

The `<processURI>` is a URI that uniquely identifies a processing step. Any reserved characters must be escaped.

The `<inputName>` is an identifier for a named input to the processing step. It is not necessarily unique within the scope of the URI.

The `<inputURI>` is a URI that uniquely identifies an input resource to the processing step. Any reserved characters must be escaped. The URI may be another `_active_` URI, making recursion possible.

Zero or more `inputName-inputURI` pairs are allowed.

The "active" URI scheme has no relative URI forms.

2. Syntax

```
activeURI    := _active:_ processURI *( input )
processURI   := absoluteURI | relativeURI
input        := _+_ inputName _@_ inputURI
inputName    := *( alphanum )
inputURI     := absoluteURI | relativeURI
```

where "alphanum" is imported from [[RFC2396](#)] and "absoluteURI" and `_relativeURI_` are imported from [[RFC2396](#)] represented using URL escaped encoding of [[RFC2396](#)] as necessary.

Character encoding of the active URI MUST force nested `_inputURI_s` to escape invalid characters if they are not within the character set.

3. Interoperability

There are no known interoperability issues.

4. Comparisions

Syntactic similarities can be drawn to the generic URIs query component syntax. However the key differences are:

- 1) Symantically the inputs are not queries to a resource.
- 2) All inputURIs must be URIs, not alphanumeric.
- 3) Recursive nesting of URIs must be defined.

5. Examples

An `_active_` URI might define an XSLT transform on an XML document:

```
active:xslt+stylesheet@foo.xsl+operand@bar.xml
```

or conversion to upper-case of a data[RFC2397] URI:

```
active:toUpper+operand@data:text/plain,foobar
```

6. History

This idea was originally prototyped in June 2002 within a working implementation of a research project within Hewlett Packard Labs. The idea was first used as a way of identifying intermediate results in XML pipelines.

1060 Research acquired the intellectual property from this research project in July 2003. The idea has since been refined for use in a generalized resource processing pipeline where unique and invariant references to derived results is key to an efficient caching strategy. `_active_` URIs are used as the internal addressing model of 1060 NetKernel which is open source and available from:

<http://www.1060.org>

7. Security

The active: URI scheme is currently intended for local processing only so there are no exceptional security considerations that are particular to this URI. Active URI specified processes are no different to any other local mechanism for specifying a process. By formalizing a request for processing into an active URI it is possible to programmatically analyse the request in a structured way for possible security issues.

Security related to any nested URIs should be given the

consideration they would normally have.

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8. References

- 1 Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997
- [[RFC2396](#)] Berners-Lee, T., Fielding, R., and L. Masinter, "Uniform Resource Identifiers (URI): Generic Syntax", [RFC2396](#), August 1998.

[RFC2397] Masinter, L., "The data URL scheme", [RFC2397](#), August 1998

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