Encoding URL Data

To URL-encode strings, use the Core Foundation functions CFURLCreateStringByAddingPercentEscapes and CFURLCreateStringByReplacingPercentEscapesUsingEncoding. These functions allow you to specify a list of characters to encode in addition to high-ASCII (0x80-0xff) and nonprintable characters.

According to RFC 3986, the reserved characters in a URL are:

```
      reserved    = gen-delims / sub-delims

      gen-delims  = ":" / "/" / "?" / "#" / "[" / "]" / "@"

      sub-delims  = "!" / "$" / "&" / "'" / "(" / ")"
                  / "*" / "+" / "," / ";" / "="
```

Therefore, to properly URL-encode a UTF-8 string for inclusion in a URL, you should do the following:

```
CFStringRef originalString = ...

CFStringRef encodedString = CFURLCreateStringByAddingPercentEscapes(
    kCFAllocatorDefault,
    originalString,
    NULL,
    CFSTR(":/?#[]@!$&'()*+,;="),
    kCFStringEncodingUTF8);
```

If you want to decode a URL fragment, you must first split the URL string into its constituent parts (fields and path parts). If you do not decode it, you will be unable to tell the difference (for example) between an encoded ampersand that was originally part of the contents of a field and a bare ampersand that indicated the end of the field.

After you have broken the URL into parts, you can decode each part as follows:

```
CFStringRef decodedString = CFURLCreateStringByReplacingPercentEscapesUsingEncoding(
    kCFAllocatorDefault,
    encodedString,
    CFSTR(""),
    kCFStringEncodingUTF8);
```

Important: Although the NSString class provides built-in methods for adding percent escapes, you usually should *not* use them. These methods assume you are passing them a string containing a series of ampersand-separated values, and as a result, you cannot use them to properly URL-encode any string that contains an ampersand. If you try to use them for something that does, your code could be vulnerable to a URL string injection attack (security hole), depending on how the software at the other end handles the malformed URL.

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