

# Furcadia Base 220 Encoding

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Scope:       Description of the Furcadia Base 220 Encoding

## Introduction

Furcadia update 023 extends the Furcadia protocol to allow representation of values with all eight bits of the byte under restricted conditions. To accompany that change, several server-sent commands have been upgraded to follow an encoding scheme known as “Furcadia Base 220 Encoding”. The format is used to describe positive (“unsigned”), numeric values with fixed data lengths.

Furcadia Base 220 Encoding relies on fixed (or “known”) data lengths. The format itself does not contain information about the length of the data.

Currently Furcadia Base 220 Encoding is used with 1, 2, and 4 byte data lengths. Different data lengths may be introduced when necessary.

To encode a single byte into Base220, the encoder must add a base value (35, or 0x23, or ‘#’) to it. To decode a single byte from Base220, the decoder must subtract a base value (35, or 0x23, or ‘#’) from it.

Encoding several bytes follows the same practice, except that each byte is modulo 220 of the original value.

Pseudocode follows:

```
for i = 1 to data length
    byteValue = originalValue modulo 220
    originalValue = originalValue / 220
    writeByte(byteValue + 35)
next i
```

Decoding several bytes follows the same practice in inverted manner.

Pseudocode follows:

```
multiplierValue = 1
originalValue = 0
```

```
for i = 1 to data length
    byteValue = readByte() - 35
    originalValue = originalValue + byteValue * multiplierValue
    multiplierValue = multiplierValue * 220
next i
```

## Base 220 Strings

Base 220 Strings are arbitrary length (0-219) strings preceded by a single Base 220 Encoded byte which tells the recipient of the string that follows.

Consider the following example of a Base 220 encoded string:

```
/Hello world!
```

The first byte (‘/’) contains value 47:  $47-35 = 12$ , which is the length of string “Hello world!”