Charsets & Encodings

PHP Benelux

Kore Nordmann

29.01.2011

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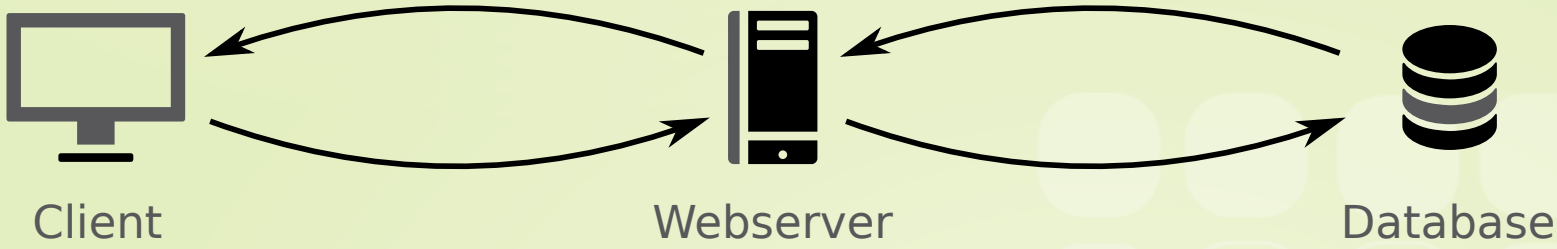
About me

- Kore Nordmann (<kore@php.net>, <kore@apache.org>, <kore@qafoo.com>)
- More than 10 years of professional PHP
- Open source enthusiast
- Contributing to various FLOSS projects
- Founder of Qafoo GmbH
  - Provides training & consulting on PHP software quality tools & processes

Outline

Common request cycle



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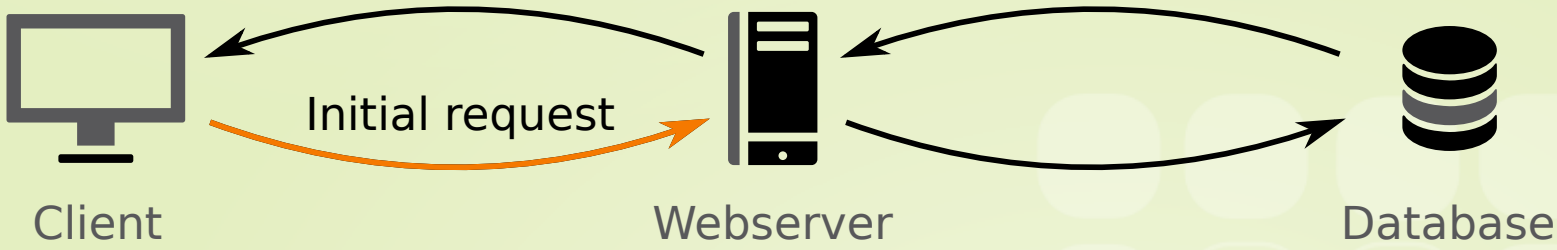

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- Normally no “data” transmission
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3  User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:2.0b10pre) Gecko/20110120 Firefox
       -4.0/4.0b10pre
4  Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
5  Accept-Language: chrome://global/locale/intl.properties
6  Accept-Encoding: gzip, deflate
7  Accept-Charset: ISO-8859-1,utf-8;q=1,*;q=0.7
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Charset vs. Encoding

- *Charset*: A set of characters
- *Encoding*: Mapping of characters to bytes
  - *Multibyte Encoding*: Mapping of a character to a sequence of bytes
- Unicode holds (far) more then 256 Characters.
  - Not possible to map to single bytes
- Unicode, ISO-8859-1, ASCII, ...
- UTF-8, UTF-16, ISO-8859-1, ASCII, ...
- different Unicode encodings
  - UTF-8, encodes full unicode, uses something between 1 and 4 bytes, ASCII compatible
  - UTF-16, does not encode full unicode, always uses 2 bytes
  - UTF-32, encodes full unicode, always uses 4 bytes
  - UTF-7, UCS2, UCS4, ...

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Charset vs. Encoding

- "This use of the term "character set" is more commonly referred to as a "character encoding"." (HTTP 1.1 Specification)

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Accept-Charset: ISO-8859-1,utf-8;q=1,*;q=0.7
```

- "This attribute specifies the list of character encodings for input data" (HTML 4.01 Specification)

```
<form action="..." accept-charset="UTF-8">
```

- XML does it "right":

```
<?xml encoding="UTF-8"?>
<doc/>
```

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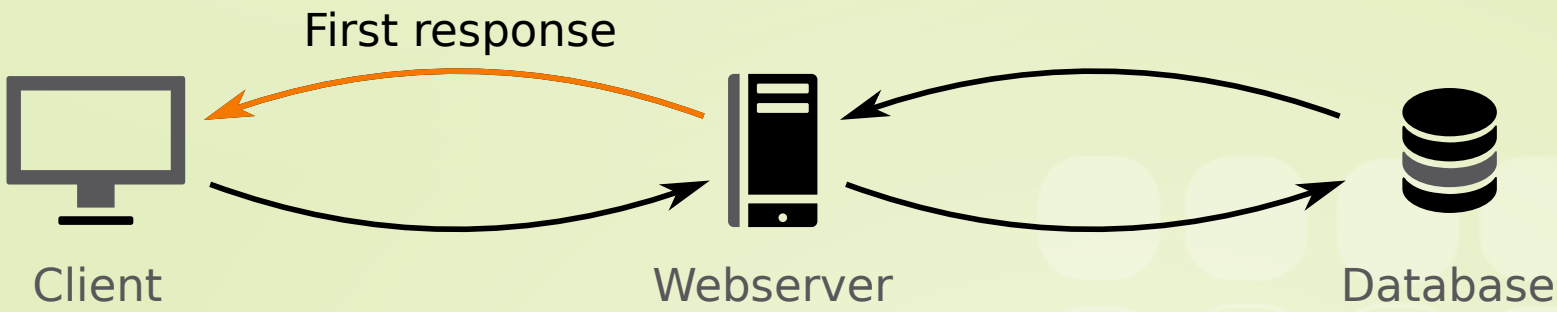

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  - PHPs string functions are *not* “multibyte-safe”

Handling multibyte encodings in PHP

- Use iconv or mbstring

```
1  <?php
2
3  $string = 'öää';
4
5  var_dump(
6      strlen( $string ),
7      iconv_strlen( $string, 'UTF-8' )
8  );
9
10 // int(6)
11 // int(3)
```

Converting between encodings

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  - pecl/translit (by Derick Rethans)

Converting

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var_dump( iconv( 'UTF-8', 'ASCII', 'öäü test' ) );
// Notice: iconv(): Detected an illegal character in input string
// string(0) ""

var_dump( iconv( 'UTF-8', 'ASCII//TRANSLIT', 'öäü test' ) );
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setlocale( LC_ALL, 'de_DE.utf8' );

var_dump( iconv( 'UTF-8', 'ASCII//TRANSLIT', 'öäü test' ) );
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var_dump( iconv( 'UTF-8', 'ASCII//IGNORE', 'öäü test' ) );
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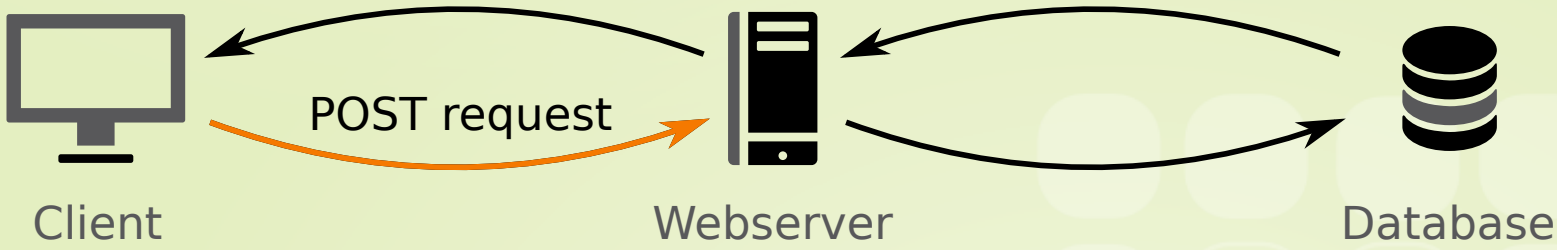

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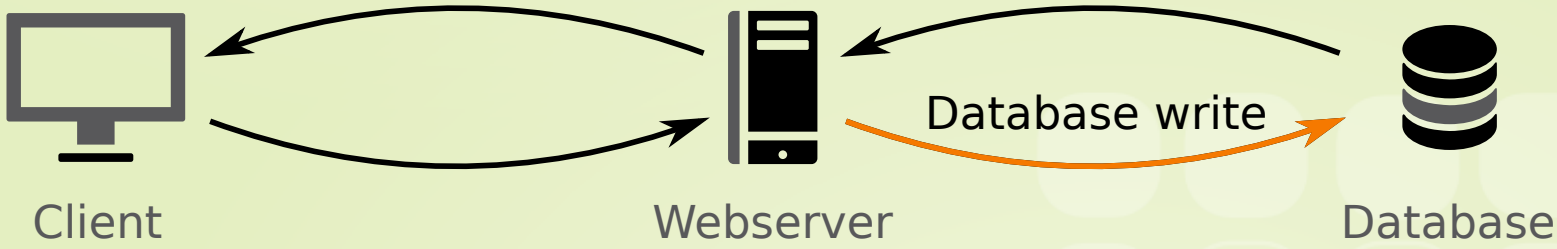

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  - Setting the encoding: `SET NAMES 'UTF-8';`
    - `mysql_real_escape_string()` will *not* be aware of this.

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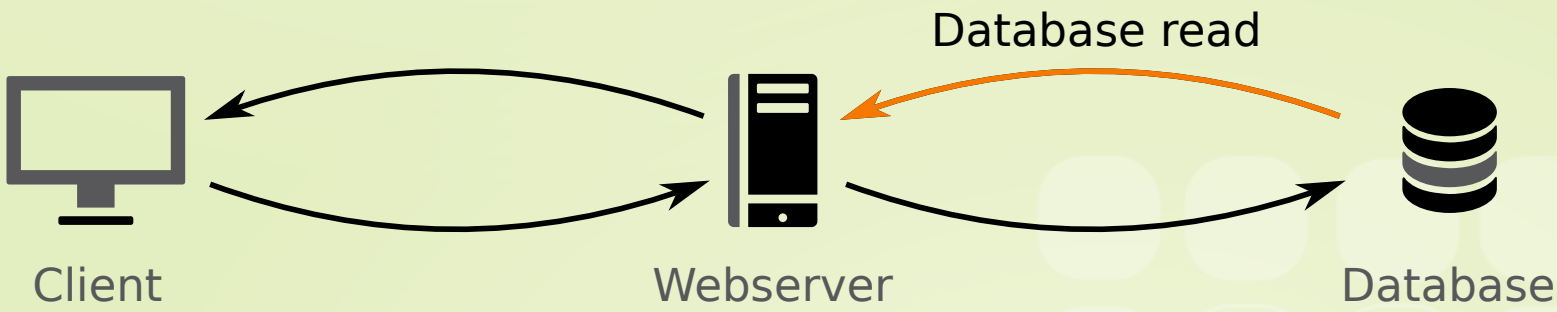

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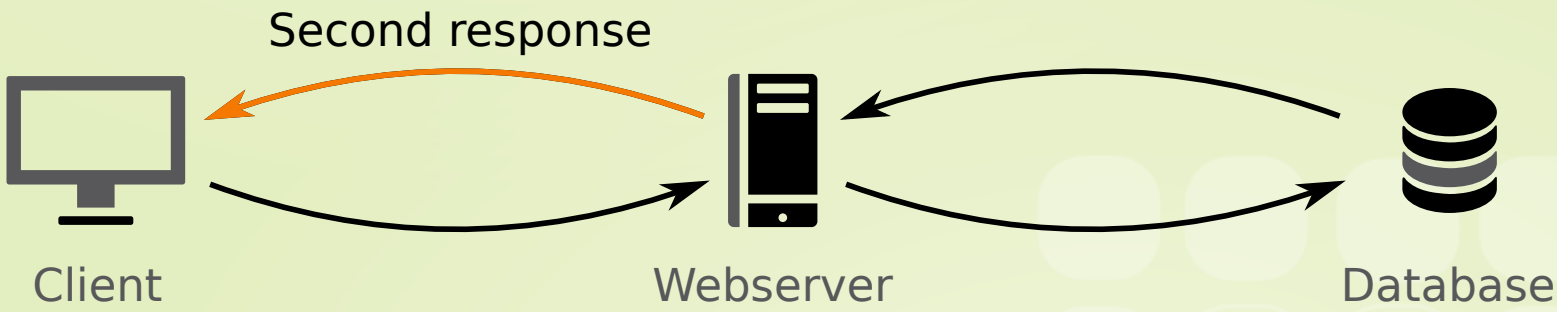
Final output



Final suggestions

- Use UTF-8 consistently in your application
  - Always convert input
  - Convert to output encoding as late as possible

Outline

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$char1 = "\x65\xcc\x81"; // U+0065 + U+0301
$char2 = "\xc3\xa9"; // U+00E9

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Thanks for listening

- More about me:
  - `http://kore-nordmann.de` / @koredn
- More about us:
  - `http://qafoo.com` / @qafoo
- *Please* rate this talk:
  - `http://joind.in/2488`
- PHP Charset & Encoding FAQ:
  `http://kore-nordmann.de/blog/php_charset_encoding_FAQ.html`