



Fluent 1.0

Next Generation Localization System

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Agenda

1. Background

What is a localization system?

2. MessageFormat

What works and what doesn't

3. Design Principles

Fluent goals and non-goals

4. Fluent 1.0

Syntax, API, Bindings,
Lifecycle, Tooling

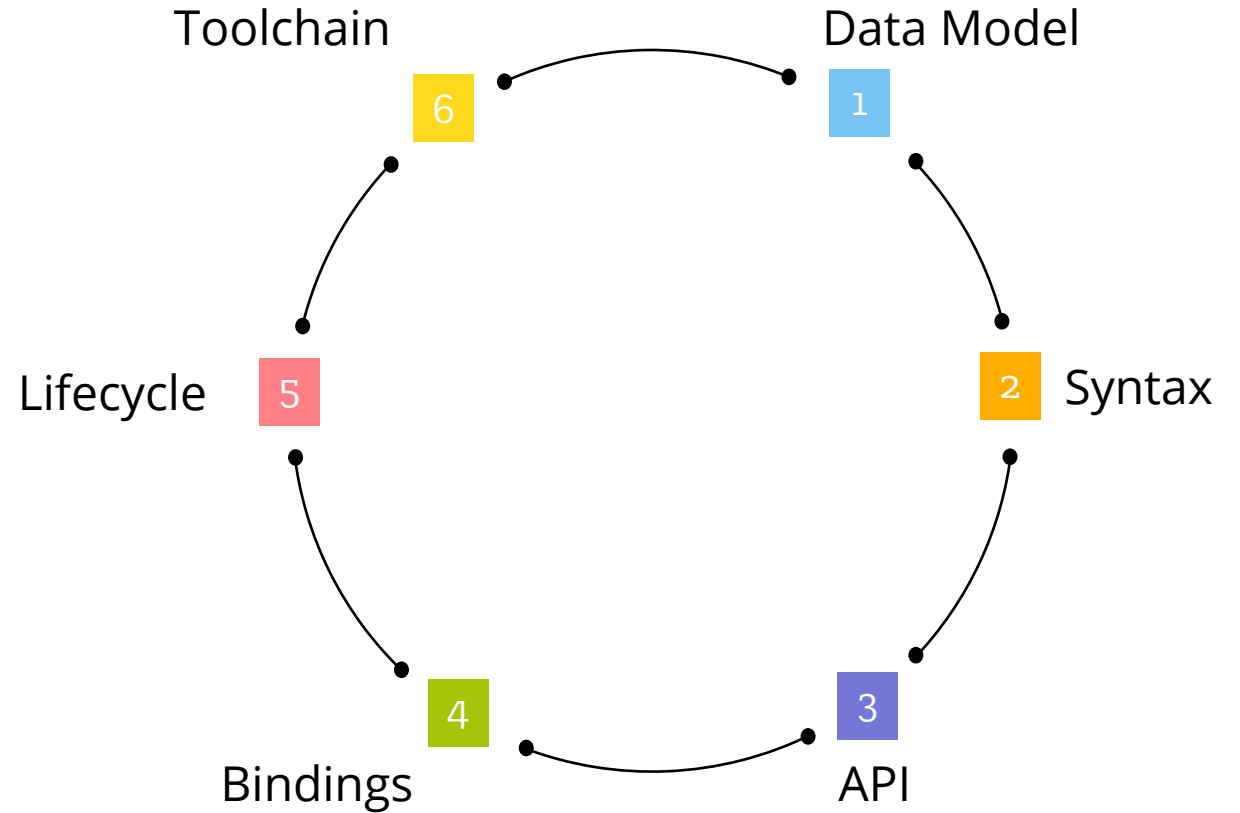
5. Timeline + RFC

What's left and how you can
help.

6. Q&A

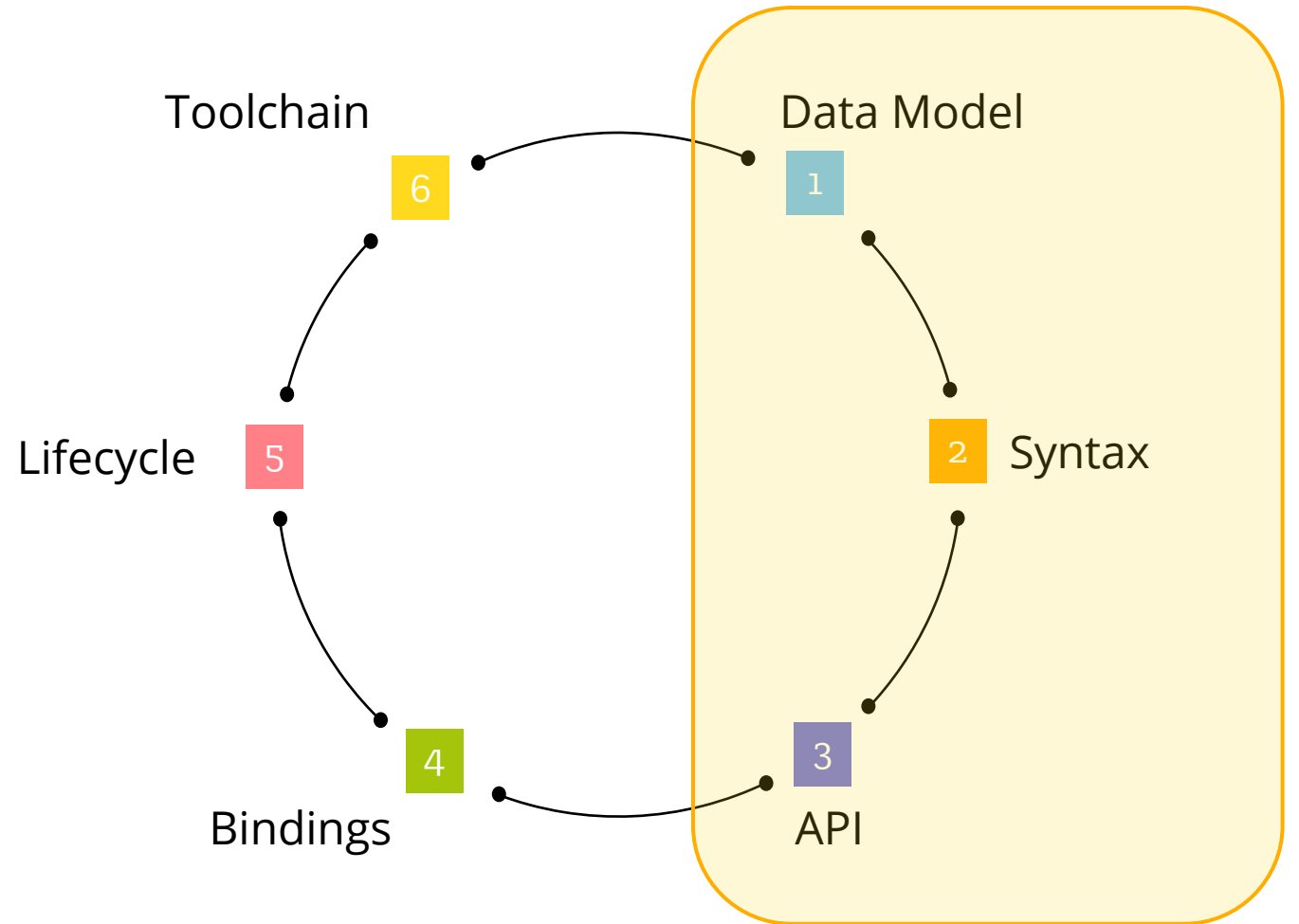
Localization System

Components



MessageFormat

Components



MessageFormat

the good parts

- Good integration with intl components
- String interpolation
- Nested string variants
- Custom selectors
- Formatter arguments

MessageFormat

the bad parts

- Lack of compound messages
- Poor BiDi
- Developer driven formatting

MessageFormat

the ugly

- Hard to read syntax
- Poor error recovery
- No multiline
- Requires an external container

MessageFormat

syntax

```
{gender_of_host, select,  
  female {  
    {num_guests, plural, offset:1  
      =0 {{host}} does not give a party.  
      =1 {{host}} invites {guest} to her party.  
      =2 {{host}} invites {guest} and one other person to her party.  
      other {{host}} invites {guest} and # other people to her party.}}}  
  male {  
    {num_guests, plural, offset:1  
      =0 {{host}} does not give a party.  
      =1 {{host}} invites {guest} to his party.  
      =2 {{host}} invites {guest} and one other person to his party.  
      other {{host}} invites {guest} and # other people to his party.}}}  
  other {  
    {num_guests, plural, offset:1  
      =0 {{host}} does not give a party.  
      =1 {{host}} invites {guest} to their party.  
      =2 {{host}} invites {guest} and one other person to their party.  
      other {{host}} invites {guest} and # other people to their party.}}}}
```

1

MessageFormat

syntax - translatables

```
{gender_of_host, select,  
  female {  
    {num_guests, plural, offset:1  
      =0 {{host}} does not give a party.  
      =1 {{host}} invites {guest} to her party.  
      =2 {{host}} invites {guest} and one other person to her party.  
      other {{host}} invites {guest} and # other people to her party.}}}  
  male {  
    {num_guests, plural, offset:1  
      =0 {{host}} does not give a party.  
      =1 {{host}} invites {guest} to his party.  
      =2 {{host}} invites {guest} and one other person to his party.  
      other {{host}} invites {guest} and # other people to his party.}}}  
  other {  
    {num_guests, plural, offset:1  
      =0 {{host}} does not give a party.  
      =1 {{host}} invites {guest} to their party.  
      =2 {{host}} invites {guest} and one other person to their party.  
      other {{host}} invites {guest} and # other people to their party.}}}}
```

1

MessageFormat

syntax - delimiters

```
{gender_of_host, select,  
  female {  
    {num_guests, plural, offset:1  
      =0 {{host} does not give a party.}  
      =1 {{host} invites {guest} to her party.}  
      =2 {{host} invites {guest} and one other person to her party.}  
      other {{host} invites {guest} and # other people to her party.}}}  
    male {  
      {num_guests, plural, offset:1  
        =0 {{host} does not give a party.}  
        =1 {{host} invites {guest} to his party.}  
        =2 {{host} invites {guest} and one other person to his party.}  
        other {{host} invites {guest} and # other people to his party.}}}  
    other {  
      {num_guests, plural, offset:1  
        =0 {{host} does not give a party.}  
        =1 {{host} invites {guest} to their party.}  
        =2 {{host} invites {guest} and one other person to their party.}  
        other {{host} invites {guest} and # other people to their party.}}}}}
```

1

MessageFormat

syntax - error recovery

```
{gender_of_host, select,  
  female {  
    {num_guests, plural, offset:1  
      =0 {{host} does not give a party.}  
      =1 {{host} invites {guest} to her party.}  
      =2 {{host} invites {guest} and one other person to her party.}  
      other {{host} invites {guest} and # other people to her party.}}}  
  male {  
    {num_guests, plural, offset:1  
      =0 {{host} does not give a party.}  
      =1 {{host} invites {guest} to his party.}  
      =2 {{host} invites {guest} and one other person to his party.}  
      other {{host} invites {guest} and # other people to his party.}}}  
  other {  
    {num_guests, plural, offset:1  
      =0 {{host} does not give a party.}  
      =1 {{host} invites {guest} to their party.}  
      =2 {{host} invites {guest} and one other person to their party.}  
      other {{host} invites {guest} and # other people to their party.}}}}}
```

1

MessageFormat

syntax - multi line

```
{gender_of_host, select,  
  female {  
    {num_guests, plural, offset:1  
      =0 {{host}} does not give a party.  
      =1 {{host}} invites {guest} to her party.  
      =2 {{host}} invites {guest} and one other person to her party.  
      other {{host}} invites {guest} and # other people to her party.}}}  
  male {  
    {num_guests, plural, offset:1  
      =0 {{host}} does not give a party.  
      =1 {{host}} invites {guest} to his party.  
      =2 {{host}} invites {guest} and one other person to his party.  
      other {{host}} invites {guest} and # other people to his party.}}}  
  other {  
    {num_guests, plural, offset:1  
      =0 {{host}} does not give a party.  
      =1 {{host}} invites {guest} to their party.  
      =2 {{host}} invites {guest} and one other person to their party.  
      other {{host}} invites {guest} and # other people to their party.}}}}
```

1

MessageFormat

syntax - external container

```
{
  "very-simple-message": "Hello {name}!",
  "part-invitation-message" :"{gender_of_host, select, \n  female {\n
{num_guests, plural, offset:1 \n      =0 {{host} does not give a party.}\n      =1
{{host} invites {guest} to her party.}\n      =2 {{host} invites {guest} and one
other person to her party.}\n      other {{host} invites {guest} and # other people
to her party.}}}\n  male {\n      {num_guests, plural, offset:1 \n      =0 {{host}
does not give a party.}\n      =1 {{host} invites {guest} to his party.}\n      =2
{{host} invites {guest} and one other person to his party.}\n      other {{host}
invites {guest} and # other people to his party.}}}\n  other {\n      {num_guests,
plural, offset:1 \n      =0 {{host} does not give a party.}\n      =1 {{host}
invites {guest} to their party.}\n      =2 {{host} invites {guest} and one other
person to their party.}\n      other {{host} invites {guest} and # other people to
their party.}}}}\n"}
}
```

1

Fluent

Fluent - Design Principles

1. Control and Isolation

2. Simplicity

3. Tolerance

4. Modularity and Composability

5. Principle of Least Power

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syntax

```
hello-world = Hello, world!
```

```
description =
```

```
Loki is a simple micro-blogging  
app written entirely in HTML5.  
It uses FTL to implement localization.
```

```
shared-photos =
```

```
{ $user_name } { $photo_count ->  
  [0] hasn't added any photos yet  
  [one] added a new photo  
  *[other] added { $photo_count } new photos  
}.
```

```
liked-comment =
```

```
{ $user_name } liked your comment on { $user_gender ->  
  [male] his  
  [female] her  
  *[other] their  
} post.
```


Fluent 1.0

syntax, 2

```
liked-comment =  
  { $user_gender ->  
    [male] { $user_name } liked your comment on his post.  
    [female] { $user_name } liked your comment on her post.  
    *[other] { $user_name } liked your comment on their post.  
  }
```

Fluent 1.0

syntax - adv.

```
welcome-paragraph =  
    This paragraph contains a multi-line  
    complex message which uses <b>Fluent Syntax</b>.  
    <img l10n-name="logo" />  
    You can read more about it <a>here</a>.  
  
# Translation unit for the main button.  
#  
# @voice Active  
# @use Button  
# @var $num (Number) - Page number of the next page.  
#  
main-button = Click to proceed.  
    .tooltiptext =  
        This button will take you to page { $num }.  
    .aria-label = Main button.
```

Fluent 1.0

syntax - adv.

```
show-date = Today is { DATETIME($date, year: "numeric", month: "2-digit") }
```

```
dpi-ratio = Your DPI ratio is { NUMBER($ratio, minimumFractionDigits: 2) }
```

Fluent 1.0

syntax - adv.

```
preferences = { PLATFORM() ->  
    [win] Options  
    *[other] Preferences  
}
```

```
long-msg = { SCREEN_WIDTH() ->  
    [wide] This is a pretty long message  
    *[narrow] Narrow message  
}
```

```
user-likes-you = { $userGender ->  
    [male] He likes you  
    [female] She likes you  
    *[other] They like you  
}
```

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API

```
1 import { FluentBundle, ftl } from 'fluent';
2
3 const bundle = new FluentBundle('en-US');
4
5 const errors = bundle.addMessages(ftl`
6     -brand-name = Foo 3000
7     welcome = Welcome, { $name }, to { -brand-name }!
8 `);
9
10 bundle.format('welcome', { name: 'Anna' });
11 // → 'Welcome, Anna, to Foo 3000!'
```

Fluent 1.0

API -

dpi-ratio = Your DPI ratio is { NUMBER(\$ratio, minimumFractionDigits: 2) }

```
1 bundle.format('dpi-ratio', {
2   ratio: new FluentNumber(3, {
3     minimumFractionDigits: 1
4   })
5 });
6 // → 'Your DPI ratio is 3.00'
7 // or
8 // → 'Your DPI ratio is 3.0'
```

Fluent 1.0

Bindings - React

```
1   <Localized
2     id="create-account"
3     confirm={
4       <button onClick={createAccount}></button>
5     }
6     cancel={
7       <Link to="/"></Link>
8     }>
9     <p>{'<confirm>Create account</confirm> or <cancel>go back</cancel>.'}</p>
10  </Localized>
```

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Bindings - Rust

```
1  extern crate fluent;
2
3  use fluent::bundle::FluentBundle;
4
5  fn main() {
6      let mut bundle = FluentBundle::new(&["en-US"]);
7      bundle.add_messages("hello-world = Hello, world!");
8      let (value, _) = bundle.format("hello-world", None)?;
9      assert_eq!(&value, "Hello, world!");
10 }
11
```


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Bindings - Python

```
1. bundle = FluentBundle(['en-US'])
2.
3. bundle.add_messages("hello-world = Hello, { $name }!")
4.
5. value = bundle.format("hello-world", {"name": "John" })
6.
7. value == "Hello, John"
```

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Bindings - JS

```
1 function * generateBundles(resIds) {
2   for (let locale of negotiatedLocales) {
3     let bundle = new FluentBundle(locale);
4     resIds.map(resId => bundle.addMessages(fetch(resId)));
5     yield bundle;
6   }
7 }
8
9 let l10n = new Localization(generateBundles);
10
11 async function main() {
12   let val = await l10n.formatValue("hello-world", {
13     name: "John"
14   });
15 }
```

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Bindings - DOM

```
<!DOCTYPE html>
<html>
<head>
  <meta charset="utf-8">
  <title data-l10n-id="page-title" />
  <link rel="localization" href="main/common.ftl" />
  <link rel="localization" href="browser/menu.ftl" />
</head>
<body>
  <h1 data-l10n-id="hello-world" />

  <p data-l10n-id="intro-paragraph" />
</body>
</html>
```

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DEMO

Fluent 1.0

Error Recovery

MessageFormat vs. Fluent

Fluent 1.0

Pontoon

The screenshot displays the Pontoon web interface for editing translations. The top navigation bar includes the language 'Polish pl', browser 'Firefox', file 'preferences.ftl', and a 'Go' button. A notification badge shows '91' and an information icon 'i'. On the right, there are notification and profile icons.

The main content area is split into two columns:

- Left Column (List of Translations):** A list of translation entries, each with a green checkbox, an English source string, and a Polish target string. The entries include: 'Show tab previews in the Windows taskbar', 'Enable Container Tabs', 'Learn more', 'Settings...', 'Close All Container Tabs?', 'If you disable Container Tabs now, { \$tabCo... }', 'Close { \$tabCount } Container Tabs', 'Keep enabled', 'Remove This Container?', and 'If you remove this Container now, { \$count }...'. The Polish strings are: 'Podgląd kart na pasku zadań Windows', 'Karty z kontekstem.', 'Więcej informacji', 'Dostosuj...', 'Czy zamknąć wszystkie karty z kontekstem?', 'Jeśli wyłączysz funkcję kart z kontekstem, { \$t...}', 'Zamknij { \$tabCount } kart z kontekstem', 'Anuluj', 'Usuwanie kontekstu', and 'Jeśli usuniesz teraz ten kontekst, { \$count } ka...'. The entry 'Close { \$tabCount } Container Tabs' is highlighted.
- Right Column (Translation Editor):** A form for editing the selected translation. It shows the source string 'Close { \$tabCount } Container Tab' and the target string 'Zamknij { \$tabCount } kart z kontekstem'. There are input fields for 'one' and 'other' plurals. Below the editor, there are tabs for 'HISTORY 2', 'MACHINERY 2', and 'LOCALES 3+93'. A 'SUGGEST' button is visible.

Comparison

MessageFormat

Fluent

API design focus	C++ and Java	Web, JavaScript, Python, and Rust
Syntax	focus on conciseness	focus on read/edit/write
Syntax scope	per message	per list of messages (resource)
Error recovery	fragile	resilient, strong recovery logic
Compound messages	none	value + attributes per message
Multi-variant messages	none	built-in support
Multiline	no explicit solution	built-in support
BiDi	none	bidirectional isolation
Intl Formatters	explicit	explicit and implicit
Formatting Control	developer	localizer + developer

Timeline

Road to 1.0

September Fluent 0.7

October Fluent 0.8

November Fluent 1.0

Learn & Contribute:

<https://www.projectfluent.org>

<https://discourse.mozilla.org/c/fluent>

<https://github.com/projectfluent/fluent/wiki>

<https://github.com/projectfluent>

Q&A

Please, take a moment to review this talk:

<http://www.unicodeconference.org/eval-sp>

moz://a

Thank You

Fluent 0.8 RFC

- Preserve user indentation
- Semantic comments
- Allow more Unicode characters in TextElements
- Select Unicode literal
- Consider removal of backslash escapes

Preserve indentation

```
intro =
```

```
This is an introduction paragraph  
with some <b>really</b> good data  
that can be used <a>here</a>.
```

Preserve indentation

```
intro =
```

```
    This is an introduction paragraph  
← with some <b>really</b> good data  
    that can be used <a>here</a>.
```

Semantic Comments

```
# $value (Number) - Value of the unit (for example: 4.6, 500)
# $unit (String) - Name of the unit (for example: "bytes", "KB")
sitedata-total-size =
  Your stored cookies, site data and cache are|
  currently using { $value } { $unit } of disk space.
```

Semantic Comments

```
RESOURCE browser/browser/preferences/preferences.ftl ID restart-later
▼ SECTION General Section - Proxy
This section contains strings related to performance.
In case of doubt, consult Firefox Performance Guide

CONTEXT
This message will be displayed inside

ARGUMENTS
$name (string) Name of a search engine.
```

Później

String versions

en-US

system-error = **Unknown system error**

es

system-error = **Error desconegut del sistema**



en-US

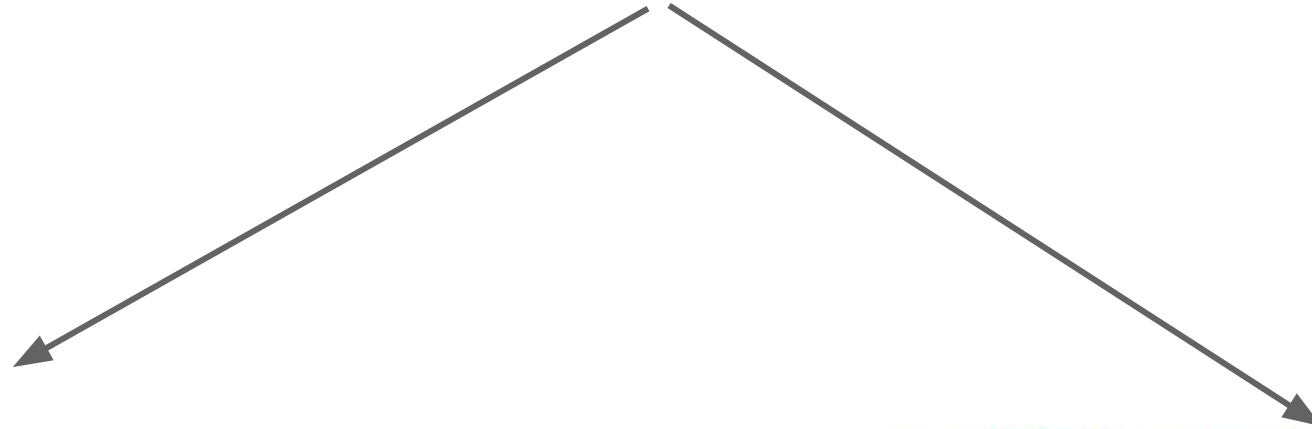
system-error2 = **Unknown System Error**

es

system-error2 =

String versions

```
msgid "Unknown system error"  
msgstr "Error desconegut del sistema"
```







#, fuzzy







```
msgid "Unknown System Error"  
msgstr "Error desconegut del sistema"
```

```
msgid "Undertermined System Error"  
msgstr ""
```

String versions

	Invalidate	Notify localizer
Source locale only		
Change of meaning		

String versions

	Invalidate	Notify localizer
Source locale only		
Stylistic		
Change of meaning		

String versions

```
# @version 2
```

```
system-error = Unknown system error
```

```
system-error = Error desconegut del sistema
```

Select Unicode Literal

BEFORE

nbsp = An\u00a0example

AFTER

nbsp = An{U+00A0}example.

Learn & Contribute:

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<https://github.com/projectfluent/fluent/wiki>

<https://github.com/projectfluent>

Q&A

Please, take a moment to review this talk:

<http://www.unicodeconference.org/eval-sp>

moz://a

Thank You