

PL/Parrot and
PL/Perl6

Parrots and Butterflies in Post- greSQL

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PL/Parrot and PL/Perl6 Parrots and Butterflies in PostgreSQL

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Parrot Virtual Machine

- Process (Application) Virtual Machine
- Register-based
- Continuation Passing Style
- Design Goals
 - Pluggable
 - Interoperable
 - Dynamic
- 2.7.0 "Australian King" just released
- Undergoing lots of optimizations

Rakudo Perl 6

- Most active implementation of Perl 6
- Implements $\sim 80\%$ of the spec
- Currently uses Parrot as a backend, but plans to support others
- Stable release series is Rakudo Star, dev release every month
- Getting faster due to optimizations in Parrot

Why Embed Parrot VM in PostgreSQL?

- Procedural/PostgreSQL Languages (PL's) are hard to write and maintain
- PL/Parrot does the hard work, HLLs benefit with much less effort
- Platform independent, fast[†], stored procedures

PL/Parrot Timeline

- PostgreSQL came from Ingres, started in the mid 1970's
- Parrot started around 2001
- Empty pgFoundry repo created 2006 by David Fetter/Joshua Tolley
- GitHub repo created Oct 2009 by Duke Leto
- PL/Perl6 started to work June 2010
- What next?

Current Features

- PL/PIR and PL/Perl6
- Pass and return basic datatypes
- Basic security model (Don't do that)
- Growing Test Suite
- Enthusiastic and friendly community
- Coolest Feature: Use Perl 6 grammars in PostgreSQL!

Things that creak

- Documentation - <http://pl.parrot.org>
- SPI - branch being worked by cxreg++, elog works!
- Triggers - we need help!
- SETOF - branch with some tests
- Row handling
- Parrot Bugs
 - IMCC Syntax Errors
 - Security API
 - Extend/Embed API

Installing/Testing PL/Parrot

- Install Rakudo or Parrot
- `# parrot_config` needs to be in your `$PATH`
- One of:
 - `git clone git://github.com/leto/plparrot.git`
 - `wget http://icanhaz.com/plparrot0.20`
 - `cd plparrot`
 - `export PGPORT=5555 # if necessary`
 - `make install installcheck # might need sudo`
 - `make test test_plperl6 # PL/PIR + PL/Perl6 tests`

PL/PIR Example 1

```
CREATE OR REPLACE FUNCTION
```

```
pir_concat(text , text , float)
```

```
RETURNS varchar LANGUAGE plpir AS $$
```

```
    .param string s1
```

```
    .param string s2
```

```
    .param num x
```

```
    if x < 0 goto backward
```

```
    $$1 = s1 . s2
```

```
    goto done
```

```
backward:
```

```
    $$1 = s2 . s1
```

```
done:
```

```
    .return($$1)
```

```
$$;
```

PL/Perl6 Example 1

```
CREATE OR REPLACE FUNCTION fibonacci_sum(int)  
RETURNS int LANGUAGE plperl6 AS $$  
{  
    [+] (1, 1, ** ... ^limit)  
}  
$$;
```

PL/Perl6 Example 2

```
CREATE OR REPLACE FUNCTION is_inventory(text) RETURNS integer
LANGUAGE plperl6 AS $$
($item) {
    # This grammar needs a 'my' because the default
    # is 'our' i.e. package scope
    my grammar Inventory {
        regex product    { \d+ }
        regex quantity   { \d+ }
        regex color      { \S+ }
        regex description { \N* }
        rule TOP { ^^ <product> <quantity>
                    [
                    | <description> '(' \s* <color> \s* ') '
                    | <color> <description>
                    ]
                    $$
                }
    }
    return ?Inventory.parse($item);
}
$$;
```

How is PL/PIR Sausage Made?

- A Parrot interpreter is created for each language
- PG datatypes are converted to Parrot datatypes, in C, with magic
- Stored procedure code is wrapped in anonymous sub, compiled and invoked from C with `Parrot_ext_call`
- Parrot datatypes are converted back to PG datatypes

How is PL/Perl6 Sausage Made?

- perl6.pbc is automagically found and loaded into the interp for PL/Perl6
- PG datatypes are converted to PL/Perl6 datatypes in PIR with `&infix<, >`
- Stored procedure code is wrapped in a closure, compiled and invoked from PIR
- PL/Perl6 datatypes are converted back to PG datatypes

Future Goals

- Easy onramps to add new languages to PL/Parrot
- Framework for DSL's
- Allow various PL's to communicate
- Freeze/thaw subtransaction-level states

Get involved!

- Try PL/Parrot on your system and submit detailed bug reports
- Fork on github and hack on stuff!
- Help with GitHub Issues
- #plparrot on freenode
- <http://pl.parrot.org>
- <http://groups.google.com/group/plparrot>

Thanks

- PL/Parrot team:
 - David Fetter, David E. Wheeler, Joshua Tolley, Daniel Arbelo Arrocha, Dave Olszewski
 - AKA davidfetter++, theory++, eggyknap++, darbelo++, cxreg++
- Everyone working on Parrot Virtual Machine, Perl 6 and PostgreSQL
- Especially (Moritz Lenz) moritz++, (Peter Lobsinger) plobsing++ and (Stephen O'Rear) sorear++, for great advice and help

Resources

- <http://pl.parrot.org>
- <http://github.com/leto/plparrot>
- <http://parrot.org>
- @parrotvm / !parrot on twitter/identi.ca
- @dukeleto / !leto on twitter/identi.ca
- Slides available at
<http://github.com/leto/presentations>