ТЕХНОСФЕРА

Модульность и повторное использование

Как разбить по файлам?

```perl

sub deployed_sources
{
  my ($self) = @_;

  my $deploy_opts = $self->deploy_opts;

  return $deploy_opts->{sources}
    if exists $deploy_opts->{sources};
  return $deploy_opts->{parser_args}->{sources}
    if exists $deploy_opts->{args}->{sources};

  return [ $self->schema->sources ];
}

```

eval

```perl
my $u;

eval '
  $u = 5;
  my $y = 10;
  sub m_3 {
    my ($x) = @_;
    return $x * 3;
  }
';

$u; # 5
$y; # Undefined
m_3(2); # 6
```

do

```
do 'sqr.pl';
```

```
# sqr.pl
$u = 5;
my $y = 10;
sub m_3 {
  my ($x) = @_;
  return $x * 3;
}
```

```
$u; # 5
$y; # Undefined
m_3(2); # 6
```

require

```perl
require 'sqr.pl';
require Local::Sqr; # Local/Sqr.pm
```

```perl
# Local/Sqr.pm
$u = 5;
my $y = 10;
sub m_3 {
  my ($x) = @_;
  return $x * 3;
}

1; # return value!
```

```perl
$u; # 5
$y; # Undefined
m_3(2); # 6
```

Файл модуля

```perl
require Module; # Module.pm
require Module::My; # Module/My.pm
```

Поиск модулей

```
perl -e 'print join "\n", @INC'
/etc/perl
/usr/local/lib/perl/5.14.2
/usr/local/share/perl/5.14.2
/usr/lib/perl5
/usr/share/perl5
/usr/lib/perl/5.14
/usr/share/perl/5.14
/usr/local/lib/site_perl
```

```
$ PERL5LIB=/tmp/lib perl ...
$ perl -I /tmp/lib ...
```

BEGIN

```perl
BEGIN {
  require Some::Module;
}

sub test1 {
  return 'test1';

  sub test2 {
    return 'test2';

    BEGIN {...}
  }
}
```

END

```
open(my $fh, '>', $file);

while (1) {
  # ...
}

END {
  close($fh);
  unlink($file);
}
```

Другие блоки

```
CHECK {}
UNITCHECK {}
INIT {}

${^GLOBAL_PHASE}
```

use Module;

```
use My_module;      # My_module.pm
use Data::Dumper;   # Data/Dumper.pm
BEGIN { push(@INC, '/tmp/lib'); }
use Local::Module; # Local/Module.pm
```

```
sub sqr {
  my ($number) = @_;

  return $number ** 2;
}

my $load_time = time();

1; # return value!
```

Как разбить по файлам? (Итого)

```
eval 'code';

do 'file';

require 'file';
require Module::Name;

use Module::Name;
```

Пространства имен?

```
require Some::Module;
function(); # ?

require Another::Module;
another_function(); # ??

require Another::Module2;
another_function(); # again!?
```

```
require Some::Module;
Some::Module::function();

require Another::Module;
Another::Module::another_function();

require Another::Module2;
Another::Module2::another_function(); # np!
```

package

```perl
package Local::Multiplier;

sub m2 {
  my ($x) = @_;
  return $x * 2;
}

sub m3 {
  my ($x) = @_;
  return $x * 3;
}
```

```perl
use Local::Multiplier;

print Local::Multiplier::m3(8); # 24
```

package — inline

```perl
{
  package Multiplier;
  sub m_4 { return shift() * 4 }
}

print Multiplier::m_4(8); # 32
```

our

```
{
  package Some;
  my $x = 1;
  our $y = 2; # $Some::y;

  our @array = qw(foo bar baz);
}

print $Some::x; # ''
print $Some::y; # '2'

print join(' ', @Some::array); # 'foo bar baz'
```

my, state

```perl
my $x = 4;
{
  my $x = 5;
  print $x; # 5
}
print $x; # 4
```

```perl
use feature 'state';

sub test {
  state $x = 42;
  return $x++;
}

printf(
  '%d %d %d %d %d',
  test(), test(), test(), test(), test()
); # 42 43 44 45 46
```

main package

```perl
our $size = 42;

sub print_size {
  print $main::size;
}

package Some;
main::print_size(); # 42
```

__PACKAGE__

```perl
package Some::Module::Lala;

print __PACKAGE__; # Some::Module::Lala
```

package VS module

```
require 'Some/Module.pm';
require Some::Module;
```

```
package Some::Module;
```

```
# :-O :-(

use Some::Module;
Some::Another::Module::function(); # surprise!
```

Пространства имен? (Итого)

```
Local/MusicLibrary/Table.pm
```

```
use Local::MusicLibrary::Table;
```

```
package
use Local::MusicLibrary::Table;
```

Импорт?

```
use Net::FaceBook::Feed::Post;

Net::FaceBook::Feed::Post::download('...');
```

```
use Net::FaceBook::Feed::Post 'download';

download('...');
```

```
using namespace std;
cout << endl;
```

```
from facebook.feed.post import download
download('...')
```

use Module LIST;

```perl
use Local::Module ('param1', 'param2');
use Another::Module qw(param1 param2);
```

```perl
BEGIN {
  require Module;
  Module->import(LIST);
  # ~ Module::import('Module', LIST);
}
```

```perl
use Module ();
# BEGIN { require Module; }
```

Пример

```perl
package My::Package;

use File::Path qw(make_path remove_tree);

# File::Path::make_path
make_path('foo/bar/baz', '/zug/zwang');
File::Path::make_path('...');
My::Package::make_path('...');

# File::Path::remove_tree
remove_tree('foo/bar/baz', '/zug/zwang');
File::Path::remove_tree('...');
My::Package::remove_tree('...');
```

Exporter

```perl
package Local::Multiplier;

use Exporter 'import';
our @EXPORT = qw(m2 m3 m4 m5 m6);

sub m2 { shift() ** 2 }
sub m3 { shift() ** 3 }
sub m4 { shift() ** 4 }
sub m5 { shift() ** 5 }
sub m6 { shift() ** 6 }
```

```perl
use Local::Multiplier;

print m3(5); # 125
print Local::Multiplier::m3(5); # 125
```

Exporter — EXPORT_OK

```perl
package Local::Multiplier;

use Exporter 'import';
our @EXPORT_OK = qw(m2 m3 m4 m5 m6);

sub m2 { shift() ** 2 }
sub m3 { shift() ** 3 }
sub m4 { shift() ** 4 }
sub m5 { shift() ** 5 }
sub m6 { shift() ** 6 }
```

```perl
use Local::Multiplier qw(m3);

print m3(5); # 125
print Local::Multiplier::m4(5); # 625
```

%EXPORT_TAGS

```perl
our %EXPORT_TAGS = (
   odd  => [qw(m3 m5)],
   even => [qw(m2 m4 m6)],
   all  => [qw(m2 m3 m4 m5 m6)],
);
```

```perl
use Local::Multiplier qw(:odd);

print m3(5);
```

import()

- Не зарезервированное слово
- Не обязан экспортировать функции пакета
- Не обязан экспортировать в принципе

```
$ perl -e 'Lol->import();'
$ perl -e 'Lol->method();'
Can't locate object method "method" via package "Lol"
(perhaps you forgot to load "Lol"?) at -e line 1.
```

Импорт? (Итого)

```perl
use Some::Module qw(some_function);
some_function('...');
```

```perl
package Some::Module;
use Exporter 'import';
our @EXPORT = qw(some_function);

sub some_function {}
```

Контроль версий?

```
$ perl -we 'use File::Path qw(make_path);'
"make_path" is not exported by the File::Path module
Can't continue after import errors at -e line 1.
BEGIN failed--compilation aborted at -e line 1.
```

```perl
use File::Path 2.00 qw(make_path);
```

use Module VERSION;

```
package Local::Module;

our $VERSION = 1.4;
```

```
use Local::Module 1.5;
```

```
$ perl -e 'use Data::Dumper 500'
Data::Dumper version 500 required--
this is only version 2.130_02 at -e line 1.
BEGIN failed--compilation aborted at -e line 1.
```

sub VERSION

```perl
use Local::Module 500;
# Local::Module->VERSION(500);
# ~ Local::Module::VERSION('Local::Module', 500);
```

```perl
package Local::Module;

sub VERSION {
  my ($package, $version) = @_;

  # ...
}
```

v-strings

```perl
use Local::Module v5.11.133;
```

```
v102.111.111; # 'foo'
102.111.111;  # 'foo'
v1.5;
```

use VERSION;

```
use 5.12.1;
use 5.012_001;

$^V # v5.12.1
$]  # 5.012001
```

Контроль версий? (Итого)

```
use Module v1.1.1;
use 5.10;
```

Pragmatic modules

```
use strict;
use warnings;
```

use strict 'refs';

```
use strict 'refs';

$ref = \$foo;
print $$ref;  # ok
$ref = "foo";
print $$ref;  # runtime error; normally ok
```

use strict 'vars';

```perl
use strict 'vars';

$Module::a;
my  $x = 4;
our $y = 5;
```

use strict 'subs';

```perl
use strict 'subs';
```

```perl
print Dumper [test]; # 'test'
```

```perl
sub test {
  return 'str';
}
print Dumper [test]; # 'str'
```

use warnings

```perl
use warings;
use warnings 'deprecated';
```

```
$ perl -e 'use warnings; print(5+"a")'
Argument "a" isn't numeric in addition (+) at -e line 1.
```

```
$ perl -we 'print(5+"a")'
Argument "a" isn't numeric in addition (+) at -e line 1.
```

use diagnostics;

```perl
use diagnostics;
```

```
$ perl -e 'use diagnostics; print(5+"a")'
Argument "a" isn't numeric in addition (+) at -e line 1 (
    (W numeric) The indicated string was fed as an argume
    that expected a numeric value instead.  If you're for
    will identify which operator was so unfortunate.
```

use lib;

```perl
use lib qw(/tmp/lib);

BEGIN { unshift(@INC, '/tmp/lib') }
```

FindBin

```perl
use FindBin '$Bin';
use lib "$Bin/../lib";
```

use feautre;

```
use feature qw(say);

say 'New line follows this';
```

use bignum;

```perl
use bignum;
use bigint;
use bigrat;
```

```
$ perl -E 'use bigint; say 500**50'
888178419700125232338905334472656250000000000000000000000

$ perl -E 'say 500**50'
8.88178419700125e+134
```

Pragmatic modules (Итого)

```perl
package Some::Module;

use strict;
use warnings;

1;
```

no

```perl
no Local::Module LIST;

# Local::Module->unimport(LIST);
```

```perl
no 5.010;
```

```perl
no strict;
no feature;
```

Как работает экспорт?

- Как копируются функции?
- Как `Exporter` узнает, куда их копировать?

Symbol Tables

```perl
{
  package Some::Package;
  our $var = 500;
  our @var = (1,2,3);
  our %func = (1 => 2, 3 => 4);
  sub func { return 400 }
}


use Data::Dumper;
print Dumper \%Some::Package::;
```

```
$VAR1 = {
          'var' => *Some::Package::var,
          'func' => *Some::Package::func
        };
```

Typeglob

```
                         +-------> SCALAR - $bar
                         |
                         +-------> ARRAY  - @bar
                         |
                         +-------> HASH   - %bar
                         |
Foo:: -----> bar  -----+-------> CODE   - &bar
                         |
                         +-------> IO     - bar (FH)
                         |
                         +-------> GLOB   - *bar
```

Typeglob — операции

```
*Some::Package::foo = *Some::Package::var;

*Some::Package::foo = \$bar;
*Some::Package::foo = \@bar;

*Some::Package::func = sub { ... }
*Some::Package::func = \&Another::Package::func;
```

caller()

```
# 0          1           2
($package, $filename, $line) = caller();
```

```
(
    $package,    $filename,    $line,
    $subroutine, $hasargs,     $wantarray,
    $evaltext,   $is_require, $hints,
    $bitmask,    $hinthash
) = caller($i);
```

Как работает экспорт? (Итого)

- Как копируются функции? — Таблица символов.
- Как `Exporter` узнает, куда их копировать? — `caller()`

local

```perl
{
  package Test;
  our $x = 123;

  sub bark { print $x }
}

Test::bark(); # 123
{
  local $Test::x = 321;
  Test::bark(); # 321
}
Test::bark(); # 123
```

local — варианты

```perl
# localization of values
local $foo;
local (@wid, %get);
local $foo = "flurp";
local @oof = @bar;
local $hash{key} = "val";
delete local $hash{key};
local ($cond ? $v1 : $v2);

# localization of symbols
local *FH;
local *merlyn = *randal;

local *merlyn = 'randal';
local *merlyn = \$randal;
```

CPAN

The Comprehensive Perl Archive Network

http://cpan.org

Metacpan

http://metacpan.org

Установка из пакета в Debian

```
$ apt-cache search libjson-perl
libjson-perl - module for manipulating
  JSON-formatted data
libjson-pp-perl - module for manipulating
  JSON-formatted data (Pure Perl)
libjson-xs-perl - module for manipulating
  JSON-formatted data (C/XS-accelerated)

# apt-get install libjson-perl
```

Установка из пакета в CentOS

```
$ yum search perl-json
======================== Matched: perl-json =======
perl-JSON-XS.x86_64 : JSON serialising/deserialisin
  done correctly and fast
perl-JSON.noarch : Parse and convert to JSON
  (JavaScript Object Notation)
perl-JSON-PP.noarch : JSON::XS compatible pure-Perl

$ yum install perl-JSON-XS
```

Утилита cpan

```
$ cpan
Terminal does not support AddHistory.

cpan shell -- CPAN exploration and modules installa
Enter 'h' for help.
```

```
$ cpan install JSON
```

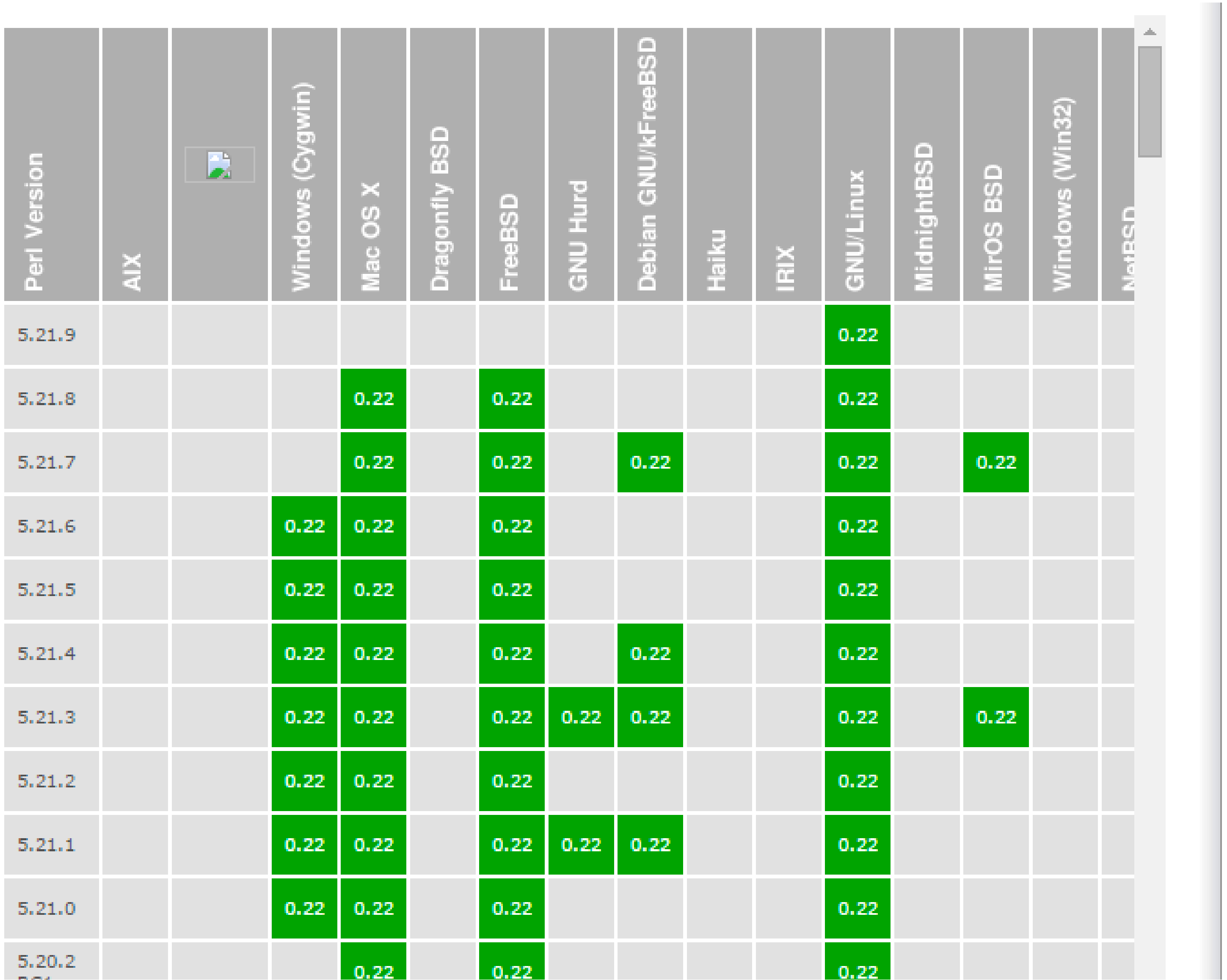
```
perl -MCPAN -e shell
```

Утилита cpanm

```
curl -L https://cpanmin.us | \
    perl - --sudo App::cpanminus
```

```
cpanm Data::Printer
cpanm MIYAGAWA/Plack-0.99_05.tar.gz
cpanm ~/dists/MyCompany-Enterprise-1.00.tar.gz
```

cpantesters



Perl Version	AIX		Windows (Cygwin)	Mac OS X	Dragonfly BSD	FreeBSD	GNU Hurd	Debian GNU/kFreeBSD	Haiku	IRIX	GNU/Linux	MidnightBSD	MirOS BSD	Windows (Win32)	NetBSD
5.21.9											0.22				
5.21.8				0.22		0.22					0.22				
5.21.7				0.22		0.22		0.22			0.22		0.22		
5.21.6			0.22	0.22		0.22					0.22				
5.21.5			0.22	0.22		0.22					0.22				
5.21.4			0.22	0.22		0.22		0.22			0.22				
5.21.3			0.22	0.22		0.22	0.22	0.22			0.22		0.22		
5.21.2			0.22	0.22		0.22					0.22				
5.21.1			0.22	0.22		0.22	0.22	0.22			0.22				
5.21.0			0.22	0.22		0.22					0.22				
5.20.2				0.22		0.22					0.22				

module-starter

```
module-starter --module Local::PerlCourse
  --author Vadim --email vadim@pushtaev.ru
```

```
$ tree Local-PerlCourse/
Local-PerlCourse/
├── Changes
├── ignore.txt
├── lib
│   └── Local
│       └── PerlCourse.pm
├── Makefile.PL
├── MANIFEST
├── README
└── t
    ├── 00-load.t
    ├── boilerplate.t
    ├── manifest.t
    ├── pod-coverage.t
    └── pod.t
```

ExtUtils::MakeMaker

```
use 5.006;
use strict;
use warnings;
use ExtUtils::MakeMaker;

WriteMakefile(
    NAME                => 'Local::PerlCourse',
    AUTHOR              => q{Vadim <vadim@pushtaev.
    VERSION_FROM        => 'lib/Local/PerlCourse.pm
    ABSTRACT_FROM       => 'lib/Local/PerlCourse.pm
    ($ExtUtils::MakeMaker::VERSION >= 6.3002
      ? ('LICENSE'=> 'perl')
      : ()),
    PL_FILES            => {},
    PREREQ_PM => {
        'Test::More' => 0,
    },
    dist                => { COMPRESS => 'gzip -9f'
    clean               => { FILES => 'Local-PerlCo
);
```

Module::Install

```
use inc::Module::Install;

# Define metadata
name           'Your-Module';
all_from       'lib/Your/Module.pm';

# Specific dependencies
requires       'File::Spec'   => '0.80';
test_requires  'Test::More'   => '0.42';
recommends     'Text::CSV_XS'=> '0.50';
no_index       'directory'    => 'demos';
install_script 'myscript';

WriteAll;
```

Module::Build

```
use Module::Build;
my $build = Module::Build->new(
  module_name => 'Foo::Bar',
  license    => 'perl',
  requires => {
    'perl'              => '5.6.1',
    'Some::Module'   => '1.23',
    'Other::Module' => '>= 1.2, != 1.5, < 2.0',
  },
);
$build->create_build_script;
```

```
  perl Build.PL
  ./Build
  ./Build test
  ./Build install
```

ДЗ 3.1

Упражнение, баллов не дает

`homeworks/getset`

```
package Local::SomePackage;

use Local::GetterSetter qw(x y);
# scalar only

set_x(50);
$Local::SomePackage::x; # 50

our $y = 42;
get_y(); # 42
set_y(11);
get_y(); # 11
```

ДЗ 3.2

8 баллов

`homeworks/music_library`

```
./Midas Fall/2015 - The Menagerie Inside/Low.ogg
./Midas Fall/2015 - The Menagerie Inside/Holes.ogg
./Midas Fall/2015 - The Menagerie Inside/Push.ogg
```

```
/---------------------------\
| Midas Fall |    Low | ogg |
|------------+--------+-----|
| Midas Fall |  Holes | ogg |
|------------+--------+-----|
| Midas Fall |   Push | ogg |
\---------------------------/
```