Software Collections
Introduction

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Summary

- What are SCL (Software Collections)
- Using SCL
- Live LAMP demo
- Packaging SCL
- Linux distributions
- Questions

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Definition

- The aim of Software Collections is to provide multiple versions of software in one distribution. The version from the collection must not interact with the system version. System version must not be polluted by collection's packages.

- Collection is a **system-independent** package or a group of packages. It could be the latest version of stable old software that is already included in the distribution.

- Collections can provide several parallel-installable versions of software.

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Needs #1

- Distribution with long support provides the same version of a software during all the life cycle (years)

- Examples :

  - RHEL-5 provides:
    Apache 2.2, MySQL 5.0 and PHP 5.1

  - RHEL-6 provides:
    Apache 2.2, MySLQ 5.1 and PHP 5.3

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Needs #2

- Distribution with short support provides recent version of software, but some applications are not yet compatible.

- Example:
  - Fedora 19 provides:
    Apache 2.4, MariaDB 5.5 and PHP 5.5

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Needs #3

- Some users need various versions of the same software
  - Developers to test their application and to ensure compatibility
  - System administrator, to test before an update
  - Shared hosting providers

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Needs #4

- Supported versions by distribution vendor (stability, security)

- No change in the base system (stability)

- System independent (same version on various systems, running different base versions)

- Simple for packager

- Simple for system administrator

- Simple for users

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Other solutions

- Virtualization
    - => heavy, cost
- Local build
    - => complex, no support
- Alternatives
    - => system wide

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SCL solution

- Set of packages (RPM)

- Separate tree

  - Installed in `/opt/<vendor>/<sclname>`

- Launcher to enable the collection

Tools

- The **scl-utils** package
  - `/usr/bin/scl`
  - `/etc/scl/prefixes`
- The **scl-utils-build** package
  - Packagers tools: rpm macros

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Content #1

- `<scl>`
  - Metapakage (empty), dependencies on most important packages of the SCL
- `<scl>-runtime`
  - `/etc/scl/prefixes/<scl>`
  - `/opt/<vendor>/<scl>/enable`
  - `/opt/<vendor>/<scl>/root`
- `<scl>-build`
  - `/etc/rpm/macros.<scl>-config` (additional macros for packager)

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Content #2

- Examples of packages in the http24 SCL

```
httpd24-apr
httpd24-apr-util
httpd24-apr-util-ldap
httpd24-apr-util-mysql
httpd24-apr-util-nss
httpd24-apr-util-odbc
httpd24-apr-util-openssl
httpd24-apr-util-pgsql
httpd24-apr-util-sqlite
httpd24-httpd
httpd24-httpd-tools
httpd24-httpd-manual
httpd24-mod_ldap
httpd24-mod_proxy_html
httpd24-mod_session
httpd24-mod_ssl
...
```

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Content #3

- Examples of a package (httpd24-httpd)

```
/etc/logrotate.d/httpd24-httpd
/etc/rc.d/init.d/httpd24-httpd                          <====
/opt/rh/httpd24/root/etc/httpd
/opt/rh/httpd24/root/etc/httpd/conf
/opt/rh/httpd24/root/etc/httpd/conf.d                   <====
/opt/rh/httpd24/root/usr/lib64/httpd
/opt/rh/httpd24/root/usr/lib64/httpd/modules
/opt/rh/httpd24/root/usr/sbin/apachectl
/opt/rh/httpd24/root/usr/sbin/fcgistarter
/opt/rh/httpd24/root/usr/sbin/htcacheclean
/opt/rh/httpd24/root/usr/sbin/httpd                     <====
/opt/rh/httpd24/root/usr/share/httpd
/opt/rh/httpd24/root/var/log/httpd
/opt/rh/httpd24/root/var/run/http
/opt/rh/httpd24/root/var/www                            <====
...
```

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How to use a SCL #1

- Installation

```
yum install php55
```

- Base system is unchanged

```
$ php -v
PHP 5.3.3 (cli) (built: Aug 19 2013 05:50:20)
```

- Using the SCL launcher

```
$ scl enable php55 'php -v'
PHP 5.5.4 (cli) (built: Sep 17 2013 17:03:02)
```

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How to use a SCL #2

- Services

```
# service php54-php-fpm status

# systemctl status httpd24-httpd.service
```

- Modules for system software

  - Ex mod_php, from SCL, for system Apache

```
# yum remove php

# yum install php54-php

# service httpd restart
```

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Demo

- Base system
  - RHEL 6
  - SELinux enabled
  - PHP 5.3
- Software Collections used
  - httpd24, php54, php55, mariadb55

  => http://rhel6/

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Configuration used

- Apache 2.4.6 proxy configuration

```
ProxyPassMatch ^/php53/(.*\.php)$
    fcgi://127.0.0.1:9000/var/www/html/$1

ProxyPassMatch ^/php54/(.*\.php)$
    fcgi://127.0.0.1:9001/var/www/html/$1

ProxyPassMatch ^/php55/(.*\.php)$
    fcgi://127.0.0.1:9002/var/www/html/$1

Alias /php53 /var/www/html
Alias /php54 /var/www/html
Alias /php55 /var/www/html
```

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Packaging #1

- ## The main SCL package

```
%global scl php54
%scl_package %scl

...

%install
cat <<EOF | tee enable
export PATH=%{_bindir}:%{_sbindir}\${PATH:+:\${PATH}}
export MANPATH=%{_mandir}:\${MANPATH}
EOF

install -D -m 644 enable \
    %{buildroot}%{_scl_scripts}/enable

%scl_install
```

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Packaging #2

- Package changes needed for SCL

```
%{?scl:%scl_package foo}
%{!?scl:%global pkg_name %{name}}
...
Name:              %{?scl_prefix}foo
...
Requires:          %{?scl_prefix}bar
...
%setup -n %{pkg_name}-%{version}
...
```

- Most magic done by RPM macros

  - `%{_bindir}`   => in the SCL

  - `%{_root_bindir}` => int the system

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- Tools are available (scl-utils in repository since Fedora 15)

- SCL are not yet allowed (but approved)

- Packaging Guidelines are under review

Red Hat #1

- Tools are available (scl-utils in base repository for RHEL-5 and RHEL-6)
- **Red Hat Developer Toolset 2.0**
  - GA since September 12th, 2013
  - For RHEL-5 and RHEL-6
  - Eclipse 4.3.0
  - Gcc 4.8.1
  - Gdb 7.6

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Red Hat #2

- **Red Hat Software Collections 1.0**
  - GA since September 12th 2013
  - Available for RHEL-6 x86_64
  - Only requires a valid RHEL subscription
  - 3 years support
  - Databases
    - MariaDB 5.5.32, MySQL 5.5.32, PostgreSQL 9.2.4
  - Languages
    - Perl 5.16.3, PHP 5.4.16, Python 2.7.5 + 3.3.2, Ruby 1.9.3, NodeJS 0.10.5

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Benefits

- For user
  - Choice
  - Simplicity
- For enterprise
  - Recent software available
  - No base system change
  - Supported
- For upstream communities
  - Faster adoption of new versions

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Links

- https://fedorahosted.org/SoftwareCollections/
- http://blog.famillecollet.com/tag/SCL
- http://developerblog.redhat.com/

Soon:

- http://www.softwarecollections.org/

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Questions?

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