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Cool Stack 1.2

Optimized Open Source Software Stack (Cool Stack)
for the Sun Solaris$^{(TM)}$ Operating System

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1. Introduction

Cool Stack is a collection of some of the most commonly used open source applications optimized for the Sun Solaris OS / UltraSPARC^(TM) and AMD Opteron platforms. These binaries will also work on Intel Xeon and compatible systems running the Solaris OS. Cool Stack has been built on Solaris 10 but will also run on OpenSolaris^(TM) and Solaris Express, Developer Edition (SXDE). By using these binaries you will enjoy the best levels of performance from your system, while also reducing your time-to-service.

Cool Stack includes several packages in the Solaris *pkgadd* format, so you can install just the ones you need. Some of the applications in Cool Stack already ship with Sun Solaris OS 10, but these are either older versions and/or not built with full optimization. Cool Stack 1.2 is built using Sun Studio ^(TM) 12 Compiler with high levels of optimization. Further, Cool Stack has been pre-configured to have the most popular applications (Apache, PHP, MySQL) to work seamlessly out of the box.

2. Cool Stack Installation

Cool Stack 1.2 includes the following packages:

- **CSKruntime**: Core runtime libraries required by other packages – libiconv, libxml2, readline, openldap, sasl2, pcre **New!**
- **CSKamp** package which in turn includes :
    - **CSKapache2**: Apache2 HTTP Server
    - **CSKphp5**: PHP 5
    - **CSKmysql32**: MySQL5 32bit
- **CSKmysql**: MySQL5 64bit database server
- **CSKperl**: Perl5 language interpreter
- **CSKphplibsbundle** which has optional libraries for PHP5 extensions. This bundle includes :
    - **CSKphplibs** : Many smaller libraries which include curl, freetype, gd, gdbm, gettext, gmp, imap, unixODBC, tidy
    - **CSKtds**: FreeTDS
    - **CSKncurses**: ncurses library
- **CSKmemcached**: Memcached distributed memory object system
- **CSKruby**: Ruby, Rubygems and Rails
- **CSKsquid**: Squid Web Proxy Cache
- **CSKtomcat**: Apache Tomcat Servlet Container
- **CSKlighttpd **New!****: Lighttpd Web Server

All of the packages also have a corresponding source package – the source package name is the same as the binary with a suffix of *Src* added. (For example: CSKapache2Src is the source package for apache2).
You must be 'root' to install the packages. Download your target packages into any directory. For each of the downloaded packages, run the following commands:

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bunzip2 <package>.pkg.bz2
pkgadd -d <package>.pkg
Note: where <package>.pkg.bz2 is the name of the downloaded file containing the package.

This process will install the package in /opt/coolstack, along with all dependent libraries. Note that the CSKamp has now been split to 3 packages so users can choose just the components they want. The CSKruntime package is required before the other packages can be installed.

After installation, please refer to the README file included in each of the application's directories. The README includes detailed information on the following:
– how the application was built
– Solaris-specific configuration and tuning notes.

2.1 Upgrading from Cool Stack 1.1

As seen from the description above, the packaging has been changed for this release. If you already have packages from Cool Stack 1.1 install, please be aware that these will be over-written with the new version. You should back up whatever files you have changed (e.g. apache2/conf directory, php5/lib/php.ini etc.) A safe way to do this is to first rename the current /opt/coolstack directory and then remove the currently installed Cool Stack packages using pkgrm CSK<*pkgname*>. Note that pkgrm will not remove files that you added as for e.g. In apache2/htdocs or elsewhere. You can save these files before installing the new packages, then re-copy your saved files back. This process is illustrated below assuming you had only CSKamp installed :
Save entire coolstack (temporarily)
bash-3.00# cp -rp /opt/coolstack /opt/coolstack1.1
Delete old Cool Stack 1.1 package
```
bash-3.00# pkgrm CSKamp
```
Save any files you added after installation
```
bash-3.00# cd /opt/coolstack
bash-3.00# mkdir /tmp/CS_save; cp -rp . /tmp/CS_save
bash-3.00# cd /tmp/save
```
*delete all files in /tmp/save you don't care about – e.g. apache2/logs/**

Add new Cool Stack 1.2 package from wherever you downloaded it to
```
bash-3.00# bunzip2 CSKamp_1.2_sparc.php.bz2; pkgadd -d CSKamp_1.2_sparc.pkg
```

Copy back the saved files. Be cautious and ensure that you're copying back ONLY required files or otherwise you could mess up your package
bash-3.00# `cp -rp /tmp/save /opt/coolstack`

Copy your original config files back from /opt/coolstack1.1. For example:
```
bash-3.00# cd /opt/coolstack; cp ../coolstack1.1/apache2/conf/httpd.conf
apache2/conf
```

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2.2 Sample Installation

Following is a sample installation of CSKamp (with much of the file list etc. omitted), assuming it has been downloaded to /tmp. Before you install CSKamp, you should install CSKruntime as follows :

```
# bunzip2 /tmp/CSKruntime_1.2_sparc.pkg.bz2
# pkgadd -d /tmp/CSKruntime_1.2_sparc.pkg
```

Now we'll install CSKamp as follows :

```
# bunzip2 /tmp/CSKamp_1.2_sparc.pkg.bz2
# pkgadd -d /tmp/CSKamp_1.2_sparc.pkg

The following packages are available:
  1  CSKapache2     Apache httpd
                    (sparc) Apache 2.2.6
  2  CSKmysql32     MySQL
                    (sparc) MySQL 5.0.45
  3  CSKphp5        PHP 5
                    (sparc) PHP 5.2.4


Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]:


Processing package instance <CSKapache2> from </tmp/CSKamp_1.2_sparc.pkg>


Apache httpd(sparc) Apache 2.2.6
Apache

Do you also want to configure csk-http service [y,n,?,q] y
...
...
## Executing postinstall script.
svccfg: Taking "initial" snapshot for svc:/network/csk-http:CSKapache2.
svccfg: Taking "last-import" snapshot for svc:/network/csk-http:CSKapache2.
svccfg: Refreshed svc:/network/csk-http:CSKapache2.
svccfg: Successful import.
csk-http service has been imported.
Please use "svcadm enable svc:/network/csk-http" to enable the service

Installation of <CSKapache2> was successful.


Processing package instance <CSKphp5> from </tmp/CSKamp_1.2_sparc.pkg>


PHP 5(sparc) PHP 5.2.4
Installation of <CSKphp5> was successful.


Processing package instance <CSKmysql32> from </tmp/CSKamp_1.2_sparc.pkg>


MySQL(sparc) MySQL 5.0.45
```

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```
Mysql

Do you also want to configure csk-mysql32 service [y,n,?,q] y
...
Installation of <CSKmysql32> was successful.
```


After the installation, you should see the following in /opt/coolstack :
```
# ls /opt/coolstack
apache2      etc          info         man          php5         share
bin          include      lib          mysql_32bit  sbin
#
```


2.3 Cool Stack Installation on SXDE/OpenSolaris

Due to some incompatibility in package processing, the data stream format of the packages do not work on some OpenSolaris and SXDE releases. The solution is to convert the streams to filesystem format. Here is an example :
```
# pkgtrans CSKamp_1.2_x86.pkg /var/tmp
# pkgadd -d /var/tmp
```
pkgadd will display all the packages available in /var/tmp and you can now choose to install whichever packages you want.

3. Cool Stack Contents

The following sections provide more details on each of these packages.

3.1 CSKruntime

This package includes the core libraries (libiconv, libxml2, readline, openldap, cyrus-sasl, pcre) used by many of the other packages. Please install this package first.

3.2 CSKamp

This package includes Apache HTTP Server 2.2.6, MySQL 5.0.45 and PHP 5.2.4 as separate packages. All the applications in the package are built and pre-configured to work together out of the box. However, you can choose to install just Apache, PHP or MySQL based on your requirements.

3.2.1 CSKapache2

Apache httpd is built with MPM pre-fork and modules for LDAP, Cache, Proxy, PHP, SSL, mod-deflate, mod_fcgid and Perl. SMF support is now included. The necessary scripts are installed if you answered 'yes' to the question 'Do you also want to configure csk-http service' while installing CSKapache2. After the package has been installed and apache2 configured, you can enable the service as follows :

```
# svcadm enable csk-http
```

After this point, SMF will automatically manage the startup and shutdown of the service. If the httpd server dies for any reason, it will automatically be re-started. Please see the README file in /opt/coolstack/apache2 for more SMF commands.

3.2.2 CSKphp5

PHP has been built with high-levels of optimization including profile feedback-based optimization. This should result in increased performance for almost all applications. A FastCGI version of PHP is included as /opt/coolstack/php5/bin/php-cgi. This application binary can be used via FastCGI from non-Apache web servers (such as lighttpd). Support for the following extensions is included:
apc, bz2, curl, dba, gd, gettext, gmp, iconv, imap, ldap, mssql, mysql, mysqli, ncurses, odbc, openssl, pdo_dblib, pdo_mysql, pdo_odbc, pdo_pgsql, pgsql, pspell, readline, snmp, suhosin, tidy, xsl, zlib

By default, only apc, mysql, mysqli extensions are enabled in the shipped php.ini i(in /opt/coolstack/php5/lib/php.ini). Before using any of the other extensions, please enable it by adding an entry for it in php.ini.

3.2.2.1 PHP Package Dependencies

Several of the php extensions require additional packages installed. These are listed below.

PHP Extension(s)	Cool Stack Package Required
Curl, dba, gd, gettext, gmp, imap, odbc, tidy, pdo_odbc	CSKphplibs
Ncurses	CSKncurses
pdo_dblib, mssql	CSKtds

pdo_pgsql and pgsql require Solaris 10 11/06 or above which includes Postgres.

3.2.3 MySQL Versions

To work with PHP, MySQL included in the CSKamp package is a 32-bit version. For the database server, we recommend you install the CSKmysql package which is a 64-bit version, allowing the use of larger caches to deliver improved performance for large databases.
Note that the 32-bit CSKamp package will work with the 64-bit CSKmysql database server. SMF support for both versions is included and can be enabled as follows (after creating the database) :
```
# svcadm enable csk-mysql32     (for 32 bit MySQL in the CSKamp package)
#svcadm enable csk-mysql        (for 64 bit MySQL in CSKmysql package)
```

See the README file in the mysql directories for more information on how to create a database and get started with MySQL before enabling SMF.

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3.3 CSKperl

This package includes Perl 5.8.8. Note that Solaris 10 ships with almost the same version of Perl (5.8.4). However, CSKperl is compiled with higher levels of optimization using the Sun Studio 12 compiler and will provide better performance (one customer reported 2x the performance using Cool Stack). Further, CSKperl includes the following extensions required by twiki and other common applications:

Authen-SASL-2.10, Bundle-CPAN-1.855,CGI-Session-4.20, Convert-ASN1-0.20,
DBD-mysql-4.005, DBI-1.59,
Digest-HMAC-1.01, Digest-MD5-2.36, Digest-SHA1-2.11,
HTML-Parser-3.56, Jcode-2.06, libwww-perl-5.805,
IO-Socket-SSL-1.02, Net_SSLeay.pm-1.30, perl-ldap-0.33, Sys-Syslog-0.18,
Unicode-String-2.09, Unicode-Map-0.112, Unicode-Map8-0.12, Unicode-MapUTF8-1.11,
URI-1.35, XML-SAX-0.14, XML-Parser-2.34 , XML-NameSpaceSupport-1.09

To use this version of perl, include /opt/coolstack/bin in your PATH before /usr/bin.

3.4 CSKmemcached

This package includes memcached 1.2.2, a distributed memory object cache system. The package also includes libevent 1.3d (with patches) which is a required library for memcached. This version of memcached provides limited multi-threading capabilities.

3.5 CSKruby

This package includes ruby 1.8.6, rubygems 0.9.0 and rails 1.2.3. Although rubygems and rails are platform-independent, they are packaged with ruby for easy installation using a single download.

3.6 CSKsquid

This package includes Squid 2.6.16 Web Proxy Cache. Squid is a single-threaded application and as such does not scale well on SMP platforms. You may need to run multiple instances to achieve scalability. SMF support for squid is now included and can be enabled as follows :
```
#svcadm enable csk-squid
```
Once enabled,SMF will automatically re-start squid if it crashes for any reason. Please see the README file in /opt/coolstack/squid for more details on how to configure squid before enabling SMF.

3.7 CSKtomcat

This package includes Apache Tomcat 5.5.23 which is a pure Java application. It is provided for convenience as it is no different from the one on tomcat.apache.org. SMF support for tomcat is now included and can be enabled as follows :
```
# svcadm enable csk-tomcat
```
Once enabled, SMF will automatically re-start tomcat if it crashes for any reason. Please see the README file in /opt/coolstack/tomcat for more details on configuring tomcat before enabling SMF.

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3.8 CSKlighttpd

This package includes lighttpd 1.4.18 which is an increasingly popular light-weight web server. You can use the php-cgi binary from CSKphp5 with lighttpd. Lighttpd is shipped with a configuration file in etc/lighttpd.conf that is optimized for Solaris and supports php5 applications via fastcgi out of the box.

3.9 Source Packages

For every binary package (except CSKtomcat), there is a corresponding package that contains the source code and build scripts used to generate the package. In most cases, a script called *make_solaris.sh* was used to build the package – this script resides in the top-level directory of each library/application. For perl, read the instructions in *README.coolstack*. Many of the other source directories, also include a *README.coolstack* file that gives additional information. We do not include a source package for tomcat as we did not build it from sources. Rather CSKtomcat is provided for convenience and is the same as available from the upstream apache tomcat site.

3.9.1 Important Notes

Please be aware of the following notes related to the source files made available with this release:

● To retain optimal performance, any re-compilation of these packages should be carried out with the Sun Studio 12 compiler (except for mysql on x86/x64 which was built using /usr/sfw/bin/gcc). The latest Sun Studio compiler is available as a free download at:
    http://developers.sun.com/sunstudio/downloads/index.jsp.
● The Apache release includes the apxs utility to help build modules for Apache. Note that the version of apxs shipping with this release generates CFLAGS settings that are only compatible with the Sun Studio compiler. If you use a different compiler, it may be necessary to modify CFLAGS manually to achieve a clean compile.
● Do NOT mix and match libraries from Cool Stack 1.1 with libraries or components in Cool Stack 1.2. Specifically, if you want to add an extension to PHP or Perl, ensure you use ALL of the libraries and components from the same Cool Stack version.

4. Additional Help

If you have gotten this far, thanks for reading this document. Please also read the FAQ at http://cooltools.sunsource.net/coolstack. The CoolTools Community can assist with questions about Cool Stack open source software within the Discussions area: forum.sun.com > Open Source Technologies > Cool Stack - http://forum.java.sun.com/forum.jspa?forumID=857

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