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OCTOBER 4TH-6TH, 2010

Developing cPanel Applications

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Contents of an Addon

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- Plugin Registration File
- UI Components
 - PHP, HTML, CGI
- Backend perl Modules
- Installation Script

Plugin Registration

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- Generated at <http://cpanel.net/developer/overview.html>
- Used for adding a UI elements to a cPanel page

Plugin Registration

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Display Order:

Order within the group.

Access URL:

URL used to access the plugin in cPanel (relative to `/usr/local/cpanel/base/frontend/<theme_name>/`).

Anchor Content:

Data in this field will be included in the anchor tags, you can use something like `target="_blank"` etc.

On Click Event:

Data in this field will be included in the anchor tags, you can use something like `—JavaScript_HERE_; return false;`

Plugin Icon:

No file chosen

32 x 32 pixel icon to be displayed in cPanel (jpg or png only, image will be resized to 32x32 automatically).

Plugin Registration

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- After running the plugin wizard it will spit back a .cpanelplugin file
- run with:

```
/usr/local/cpanel/bin/register_cpanelplugin  
$plugin_file
```

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The cPanel Frontend

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- Document root:
/usr/local/cpanel/base/
- Theme root:
/usr/local/cpanel/base/frontend/x3/
- Non-cPanel Applications:
/usr/local/cpanel/base/3rdparty/



Looking the part

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```
<cpanel Branding="include  
(stdheader.html)"> <div class="body-  
content">content goes here</div> <cpanel  
Branding="include(stdfooter.html)">
```

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Looking the part

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The screenshot shows the cPanel VPS Optimized 3 interface. At the top left is a home icon and the text 'HOME'. At the top right are a help icon and the text 'HELP', and a user icon and the text 'LOGOUT'. Below this is a blue banner with a world map and the text 'cPanel VPS Optimized 3'. Underneath the banner is a white bar with the text 'CPANEL 11'. Below that is a large white area with the text 'content goes here'. At the bottom is a navigation menu with the following items: Home, Trademarks, Help, Documentation, Contact, and Logout, separated by small squares.

Flow of a cPanel Request

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- cpsrzd receives a request
- spawns cpanel process
- cpanel parses .html executes cpanel tags
- perl functions (cpanel's API calls) are executed based on the contents of cpanel tags



What calls are available?

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Every action in cPanel is an API call.

- Listing databases
- Displaying icons
- Adding email accounts
- Installing perl modules

Types of API calls

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- API1
 - Order based arguments
 - Prints strings
- API2
 - Named based arguments
 - Returns data structures



Example of an API1 call

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Net::dnslookup

```
<cpanel Net="dnslookup($FORM{'dns'})">
```

cpanel.net has address 69.90.250.19

cpanel.net has address 208.74.123.44

cpanel.net mail is handled by 10 mx2.cpanel.net.

cpanel.net mail is handled by 0 mx1.cpanel.net.

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API1 Error Handling

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<cpanelif>

```
<!--<cpanel Mysql="adddb($FORM{'db'})">--  
><cpanelif !$CPERROR{'mysql'}>  
Database $FORM{'db'} successfully added.  
</cpanelif>  
<cpanelif $CPERROR{'mysql'}>  
Failure: $CPERROR{'mysql'}  
</cpanelif>
```



Example of an API2 call

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MysqlFE::listusersindb

```
<data>  
<db>cptest_phpbb</db>  
<user>cptest_forum</user>  
</data>  
<data>  
<db>cptest_phpbb</db>  
<user>cptest_admin</user>  
</data>
```



Example of an API2 call

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MysqlFE::listusersindb

```
<?cp MysqlFE::listusersindb(  
[b]%[/b] %[br], db, user, )  
db=$FORM{'db'}, ?>
```

```
cptest_phpbb cptest_forum  
cptest_phpbb cptest_admin
```

The XML-API and cPanel

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- Designed for WHM management
- Has a cpanel wrapper call that allows you to call API1 and API2
- Only recommended for API2
- Has JSON response mode

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XML-API's cpanel call

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Parameters

- `cpanel_xmlapi_module` defines module
- `cpanel_xmlapi_func` defines function
- `cpanel_xmlapi_apiversion` (optional) to specify API1/API2
- `cpanel_xmlapi_user` to define username if not called via cpanel

XML-API cpanel example

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Input

```
/xml-api/cpanel?  
cpanel_xmlapi_module=Email&  
cpanel_xmlapi_func=passwdpop&  
domain=somedomain.com&  
email=emailuser&  
password=$0m3|*4$$w( )d!!
```

```
<cpanelresult>  
<apiversion>2</apiversion>  
<data>  
<reason>Ok</reason>  
<result>1</result>  
</data>  
<event>  
<result>1</result>  
</event>  
<func>passwdpop</func>  
<module>Email</module>  
</cpanelresult>
```

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- PHP is an option!
- two implementations:
 - cpphp/phpcp
 - LivePHP
- Runs PHP as CGI under user in executing the script

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.cplusplus example

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getmailserver.cpphp

Original:

```
<$php
  $mailserver = "<cpanel
Email="getmailserver()">";
?>
```

Temporary file:

```
<$php
  $mailserver = "mail.domain.com";
?>
```

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- Class for accessing our APIs from PHP
- more robust than cpphp
- Works off of the same code as xml-api
- socket based connection

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LivePHP Example

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`$cp/base/frontend/x3/demo.live.php`

```
include("/usr/local/cpanel/php/cpanel.php");
$cpanel = new CPANEL();
$mail_accts =
$cpanel->api2('Email','listpopswithdisk');

foreach ($mail_accts as $mail_acct) {
print $mail_acct['email'] . "<br />";
}
$cpanel->end();
```

The cPanel backend

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- compiled perl 5.6.2
- No CPAN
- Cpanel:: namespace
- User code: `/usr/local/cpanel/Cpanel`
- Vendor Modules: `/usr/local/cpanel/perl`

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Adding API1 calls

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/usr/local/cpanel/Cpanel/DemoAPI1.pm

```
package Cpanel::DemoAPI1;

sub DemoAPI1_init { return; }

sub DemoAPI1_uc {
my ($string) = @_ ;
print uc($string);
}
```

```
<cpanel DemoAPI1="uc("appear in upper case")">
```

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Adding API2 calls

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/usr/local/cpanel/Cpanel/DemoAPI2.pm

```
package Cpanel::DemoAPI1;

sub api2_ls {
my %OPTS = @_ ;
my @file_list = split("\n", `ls $OPTS{'dir'}` );
return { files => \@file_list };
}

sub api2 { consult docs for more info }
```

Privilege Escalation

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- Allows for code to be run as root
- Run through the AdminBin/cpwrap system.
- MAJOR security concern
- Uses:
 - Service Configuration
 - Privileged API keys

Parts of AdminBin

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- Admin Binary (aka wrap.c)
 - setuid root
 - checks that it is called from a cpanel binary
 - Written in C
 - calls Admin Script
- Admin Script
 - Interpreted
 - Performs the action in question

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Flow of privilege escalation

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- cPanel module calls Cpanel::AdminBin

```
Cpanel::AdminBin::adminrun(  
  'ssl', "FETCH", 'cptest.com', 'crt'  
);
```

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Flow of privilege escalation

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- Cpanel::AdminBin calls the 'wrapper' binary
- Writes command to STDIN on the wrapper binary

```
/usr/local/cpanel/bin/sslwrap  
STDIN> FETCH cptest.com crt
```

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Flow of privilege escalation

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- Wrapper script will go and execute the admin script
- Admin scripts verifies that the user has access to requested data
- Admin script performs action and returns data back to Cpanel::AdminBin

```
/usr/local/cpanel/bin/ssladmin  
STDIN> 500 FETCH cptest.com crt  
-----BEGIN CERTIFICATE-----
```

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Flow of privilege escalation

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```
echo 'skipparentcheck=1' > /var/cpanel/cpanel.config
```

```
root@host$ su - cptest
cptest@host$ /usr/local/cpanel/bin/sslwrap
FETCH cptest.com crt-----BEGIN
CERTIFICATE-----
MIIDaTCCA+KgAwIBAgIJAIIo...-----END
CERTIFICATE-----
```

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- No standard format
- Just a shell script that installs it

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Additional Resources

- Development Documentation:
<http://sdk.cpanel.net/>
- Developer Forums:
<http://forums.cpanel.net/developer-discussions.html>
- Tickets System
- Integration Blog
<http://www.cpanel.net/blog/integration/>