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cPanel Conference 2009
October 5th, 6th & 7th - Houston, Texas

Product Integration 101

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David Grega



Presentation Overview

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Introducing you to the integration possibilities offered by cPanel and WHM without going into excessive technical detail.

We will be discussing:

- Making API calls to both cPanel & WHM
- Customizing the behavior of cPanel functionality
- Adding entirely new functionality to both cPanel and WHM



The Presenters

Matt Dees

- Member of cPanel Integration Team.
- Wrote majority of cPanel development documentation.
- Handles integration support, testing and development of integration utilities.

David Grega

- Technical Sales
- Explain the capabilities of cPanel software, including the extent to which it can be customized.



Knowing Our Audience

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Knowing Our Audience

System Administrators, please raise your hand.

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Knowing Our Audience

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System Administrators, please raise your hand.

Developers, please raise your hand.



Knowing Our Audience

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System Administrators, please raise your hand.

Developers, please raise your hand.

Decision Makers, please raise your hand.



Remote APIs

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- XML-API
- Manage 2 API
- API Client Libraries



What is the XML-API?

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- XML Response Mechanism
- Can return JSON as well
- Implements WHM Actions
- Accounting Functions
- Administrative Functions
- Documentation: <http://sdk.cpanel.net/xmlapi>



XML-API Possible Uses

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- Billing System
- Centralized Server Management
- Desktop Applications/Widgets
- Admin Shell Scripts



loadavg

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/xml-api/loadavg

```
<loadavg>  
  <one>0.00</one>  
  <five>0.00</five>  
  <fifteen>0.00</fifteen>  
</loadavg>
```



createacct

[/xml-api/createacct?](#)
[username=myuser&](#)
[password=temp123&](#)
[domain=mydomain.com](#)

This data can also be passed in as POST data.

<http://sdk.cpanel.net/xmlapi>



XML-API Client Libraries

Libraries are available at <http://sdk.cpanel.net/lib/>

Available under a BSD license

Languages:

- Perl
- PHP
- Future Languages? (we'd like to hear from you, what you want)



What Do These Libraries Actually Do?

Designed so someone with basic scripting abilities can use our XML-API.

- Returns SimpleXML Objects, Associative Arrays/ Hash references, raw JSON or raw XML
- Convenience functions for all XML-API Calls
- Allows for simple authentication
- Built in support for cPanel functions
- Released under BSD License



SimpleXML & XML::Simple

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- XML Data:
 <node>
 <container> STRING </container>
 </node>
- SimpleXML (PHP):
 \$xml_obj = simplexml_load_string(\$xml);
 \$xml_obj->container == 'STRING'
- XML::Simple (perl):
 my \$XML_obj = XMLin(\$xml);
 \$xml_obj->{'container'} eq 'STRING'



PHP XML API Library Example

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```
include('cp_xmlapi_php.inc');  
$xmlapi = new xmlapi( $IP );  
$xmlapi->hash_auth( 'root', $HASH );  
$loadavg = $xmlapi->loadavg();  
print $IP . ' : ' . $loadavg->one;
```

```
matt@cpconf $ ./xmlapi-php-test.php  
127.0.0.1: 0.70
```



Perl XML API Library Example

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```
use Cpanel::XMLAPI;  
my $xmlapi = xmlapi->new( $IP );  
$xmlapi->hash_auth( 'root', $HASH );  
$loadavg = $xmlapi->loadavg();  
print $IP . ' : ' . $loadavg->{'one'};
```

```
matt@cpconf $ ./xmlapi-php-test.pl  
127.0.0.1: 0.70
```



What is the Manage2 API?

- Interface similar to the XML-API for Manage2 available to cPanel Partner NOCs
- Handles cPanel licensing requests
- Designed to assist automated datacenter deployment
- Has API client libraries available



What is the Manage2 API?

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- Adding Licenses
- Removing Licenses
- Transferring Licenses
- Modifying Licenses
- Lookup Licenses IDs
- Checking Licenses



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Local APIs



Local APIs

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- Used for account-level actions
- API1 and API2
- Can be called via the XML API



API1

- Prints data to the cPanel Interface
- Takes order-based arguments
- Called via <cpanel> html tags

Example:

```
<cpanel Email="addpop (  
  $FORM{ 'email' },  
  $FORM{ 'password' },  
  $FORM{ 'quota' },  
  $FORM{ 'domain' }  
) ">
```

- <http://sdk.cpanel.net/api1>



API2

- Returns data to the cPanel interface
- Takes name-based arguments
- Called via `<?cp >` html tags

Example:

```
<?cp Email::listlists(  
  %[br /],  
  list,  
)  
?>
```

- <http://sdk.cpanel.net/api2>



API1 and API2 via the XML-API

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/xml-api/cpanel

- Passed in either XML Data or as URL parameters
- API1 will usually not return data
- API2 will return well-formed XML
- <http://sdk.cpanel.net/xmlapi-cpanel>



XML API

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- Call `/xml-api/cpanel`
- API1 just uses `arg-n` to denote argument order
- API2 takes normal params
- Pass special `cpanel_` parameters:

```
/xml-api/cpanel?user=USER&  
xmlapi_cpanel_module=Email&  
xmlapi_cpanel_func=listpopswithdisk&  
domain=yourdomain.com
```



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Customizing the Behavior of cPanel Functionality



Scenario

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To improve DNS reliability, you decide to use a hosted DNS service.

You need to update the DNS zones in this third party solution every time DNS is modified through cPanel.

How do you get this to work with cPanel?



cPanel Function Hooks

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Allow you to execute your own custom code whenever a specific event takes place in the cPanel interface.

If you want to do something whenever a subdomain is added, we just execute a shell script whenever that function is called in cPanel!



Shell Scripts?

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Shell Scripts?

Raise your hand if you are experienced with programming shell scripts.

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Shell Scripts?

Raise your hand if you are experienced with programming shell scripts.

Keep your hand up if you have ever built a shell script from scratch before.



Crash course in Shell Scripts

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Shell scripts need to have executable permissions (e.g. 755) to run.

Shell scripts will not run if the user trying to start the script does not have sufficient access. In other words, file ownership is important.

The shebang on the first line of the file, not file extension, determines what programming language interpreter will be used to run the shell script. For example:

```
#!/usr/bin/perl  
#!/usr/bin/php -q  
#!/usr/bin/python
```



cPanel Function Hook Scripts

Just place your hook script at:

```
/usr/local/cpanel/hooks/MODULE/FUNCTION
```

Where **MODULE** is the name of the API1 or API2 module in which the function belongs.

Where **FUNCTION** is the name of the API1 or API2 function.



Sample Script

There is a sample cPanel Function Hooks script programmed in Perl on all cPanel servers at:

```
/usr/local/cpanel/hooks/  
passwd/change_password.example
```

Documentation on this topic is available at:

<http://sdk.cpanel.net/function-hooks>



For Experienced Programmers

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For experienced programmers that have a developer server running cPanel/WHM at their disposal, we have Custom Event Handlers.

These are more powerful, since you can abort certain events and execute code **before** or after cPanel executes its code for an API1 or API2 function.

Documentation on this is on our website at:

<http://sdk.cpanel.net/CustomEventHandler>

Please test on a development server before putting this into production use!



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Adding New Functionality to cPanel



Augmenting cPanel

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Augmenting cPanel

Raise your hand if you offer your customers some value-added service like free ad credits?

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Augmenting cPanel

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Raise your hand if you offer your customers some value-added service like free ad credits?

Keep your hand up if you would like to link to these within your cPanel interface.



Augmenting cPanel

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Raise your hand if you offer your customers some value-added service like free ad credits?

Keep your hand up if you would like to link to these within your cPanel interface.

Keep your hand up if you already do this.



Scenario

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Your company has just signed an affiliate deal to offer your customers some value added services like SEO optimization or ad credits with a popular online advertiser.

How do I get links to those offerings added to the cPanel interface?





Adding Icons to cPanel

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This is most effectively done via cPanel Plugins.

cPanel Plugins is how you add new icons to the cPanel interface.

These icons can be enabled or disabled on different feature lists, meaning you can disable these for some users on your server.

With cPanel Plugins, you can do something as simple as link to another website or as complex as adding an icon for new pages you're adding to the cPanel interface.



Linking to a Website in cPanel

If you only want to add a link to a website in cPanel, you can use our online Plugin Install File Generator

The Plugin Install File Generator is located in the Developer section of cPanel.net



Plugin Install File Generator

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Plugin Name:

Name of the Plugin.

Module Description:

Description of the module (used for branding).

Feature Manager?

If enabled, the feature will be an option in the feature manager.

Display Name:

Name displayed in the cPanel Interface.

Display Group:

What cPanel icon group the icon should appear in. (Currently only in x3).

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>/).



Plugin Install File Generator

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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:

Browse...

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

submit

Step 2 - Follow Installation Instructions

[View cPanel Plugins Installation Instructions](#)



Another Scenario

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You have given a customer shell access to the server. The software they are trying to run isn't so great and needs to be restarted every so often.

How can I make it so they just click a button in cPanel to restart the software?



Steps to Build a cPanel Plugin

1. Build your web page / web application.
2. Place this page or directory in
`/usr/local/cpanel/base/frontend/x3/`
3. Use the cPanel Plugin Generator for adding the icon to the cPanel interface.
4. If you want to distribute this plugin, build a command line installer script to handle placing the files in their correct location and installing the plugin file generated by the cPanel Plugin Generator.



Plugin Install File Generator

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Plugin Name:

Name of the Plugin.

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Order within the group.

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



Plugin Install File Generator

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Order within the group.

Access URL:

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

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

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

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Browse...

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

submit

Step 2 - Follow Installation Instructions

[View cPanel Plugins Installation Instructions](#)



Be Mindful

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- cPanel Plugins can only do what the cPanel user can do.
- You can trigger cPanel actions from a cPanel Plugin using the cPanel APIs. This can be useful if you need to create databases as part of a plugin that installs a web application.



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cPanel Modules



cPanel Modules

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- New API calls can be added to cPanel
- Much faster than using a CGI script
- Calls also available via the XML-API



API1 Call Example

```
/usr/local/cpanel/Cpanel/RestartCustom.pm
```

```
package Cpanel::RestartCustom;

sub RestartCustom_init { return; }

sub RestartCustom_restartapp {
    system("/etc/init.d/service restart");
}

1;
```

```
<cpanel RestartCustom="restartapp ()">
```

<http://sdk.cpanel.net/CpanelModules>



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Adding New Functionality to WebHost Manager



Scenario

You have a server maintenance shell script but would like to access this via WHM instead of having to log into SSH all the time.

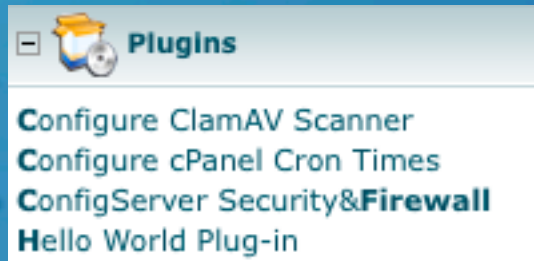
How can this be done?



A WHM Plugin

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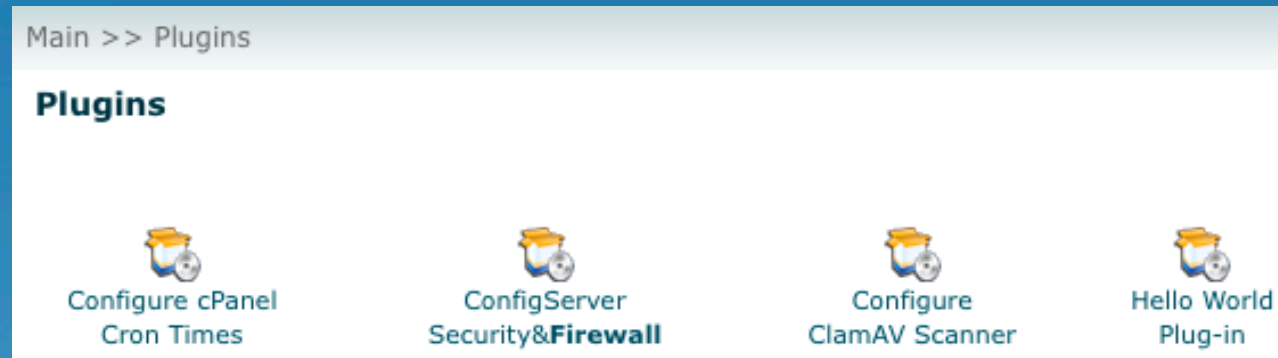
- Adds a link under the “Plugins” section of WHM
- WHM Plugins are carefully constructed CGI scripts.



Main >> Plugins

Plugins

- Configure ClamAV Scanner
- Configure cPanel Cron Times
- ConfigServer Security&Firewall
- Hello World Plug-in



Main >> Plugins

Plugins

- Configure cPanel Cron Times
- ConfigServer Security&Firewall
- Configure ClamAV Scanner
- Hello World Plug-in



Building a WHM Plugin

1. Create a CGI script with a file name of `addon_YOURNAME.cgi` in `/usr/local/cpanel/whostmgr/docroot/cgi/` where `YOURNAME` is anything that can be used in a valid Unix filename
2. The following should appear near the top of the file (preferably on line 2):

```
#WHMADDON:addonupdates:My Plugin Name
```



Sample WHM Plugin Code

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```
#!/usr/bin/perl
#WHMADDON:addonupdates:Hello World Plug-in

print "Content-type: text/html\r\n\r\n";
print '<h1>Hello World!</h1>';

1;
```

The screenshot shows the WHM interface with the following elements:

- Left sidebar menu:
 - SQL Server (PgSQL)
 - SSH Server (OpenSSH)
 - Plugins** (highlighted)
 - Configure ClamAV Scanner
 - Configure cPanel Cron Times
 - ConfigServer Security&Firewall
 - Hello World Plug-in** (highlighted with a dashed box)
- Top header:
 - WHM** VPS Optimized₃
 - Home | News | Change Log | Secure | Logout (root)
- Main content area:
 - Hello World!**



Be Mindful

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- WHM Plugins run as user **root**.
- Because of this, it is generally a good idea to only let root-level users use WHM Plugins.
- The name of your plugin on line 2 of the file may contain HTML if you desire.
- If you use Perl as your programming language, you will be able to call some WHM functions to have your Plugin blend in with the appearance of the WHM interface.



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Access Control to WHM Plugins



Access Control

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Access Control

Raise your hand if you know what an ACL is.

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Access Control

Raise your hand if you know what an ACL is.

Keep your hand up if you know where to configure an ACL in WHM.



Access Control Lists (ACLs)

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Super Privs [Add All](#) | [Remove All](#)

Account Management

- Account Modification (**warning: this will allow circumvention of account creation limits, give shell access unless explicitly disallowed, dedicated ips, etc**)
- Bandwidth Limiting Modification (**Warning: This will allow circumvention of account package limits if you are not using resource limits**)
- Quota Modification (**Warning: This will allow circumvention of account package limits if you are not using resource limits**)
- Turn an account into a demo account

Advanced Account Management

- Rearrange Accounts (used to free up disk space)

Root Access [Add All](#) | [Remove All](#)

Everything

- All Features (**warning: total and complete access**)

Save this list as (optional):

(none)





List of ACLs

List generated by viewing the contents of: /usr/local/cpanel/Whostmgr/ACLS.pm

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- demo
- disallow-shell
- viewglobalpackages
- add-pkg
- add-pkg-ip
- add-pkg-shell
- all
- allow-addoncreate
- allow-parkedcreate
- allow-unlimited-bw-pkgs
- allow-unlimited-disk-pkgs
- allow-unlimited-pkgs
- clustering
- create-acct
- create-dns
- demo-setup
- edit-account
- edit-dns
- edit-mx
- edit-pkg
- frontpage
- kill-acct
- kill-dns
- limit-bandwidth
- list-accts
- mailcheck
- news
- park-dns
- passwd
- quota
- rearrange-accts
- res-cart
- resftp
- restart
- show-bandwidth
- ssl
- ssl-buy
- ssl-gencrt
- stats
- status
- suspend-acct
- thirdparty
- upgrade-account



Sample Code with ACL Support

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```
#!/usr/bin/perl
#WHMADDON:addonupdates:Hello World Plug-in
print "Content-type: text/html\r\n\r\n";
use lib '/usr/local/cpanel';
use Whostmgr::ACLS ();
Whostmgr::ACLS::init_acls();
if (!Whostmgr::ACLS::checkacl( 'all' ) ) {
    print 'Access Denied.';
    exit;
}
print '<h1>Hello World!</h1>';

1;
```



ACL Support Without Perl?

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- Yes! First, determine the username of the person accessing the page.
- For example, in PHP, the username can be accessed using the variable:

```
$_ENV [ 'REMOTE_USER' ]
```

SQL Server (PgSQL)
SSH Server (OpenSSH)

WHM VPS Optimized 3

Home News Change Log Secure Logout (root)

Hello World!

You are logged in as: root!

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Determine ACL via Username

- ACLs are stored in the file: **`/var/cpanel/resellers`**
- Can use the reseller's username, and compare that with the information stored in **`/var/cpanel/resellers`** to determine if the user should have access to your plugin.
- Sample Code is available for PHP at:
<http://sdk.cpanel.net/examples/php-acl.tar.gz>



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Let's Review Everything



Presentation Recap

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- You can use the XML-API to trigger actions in both cPanel & WHM.
- You can use the Manage2 API to control your cPanel licenses
- Function Hooks allow us to customize the behavior of cPanel functionality.
- Plugins allow us to add entirely new functionality to both cPanel and WHM.

Additional Resources:

Developer's Resources: <http://sdk.cpanel.net>

Developer's Corner on the forums: <http://forums.cpanel.net/>

Integration Blog: <http://cpanel.net/blog/integration>

Also check out the presentation:
Softlayer - Using the API & modules to enhance cPanel functionality.

Questions?



If you think of any questions later, you can ask us here at the cPanel Conference or find us via the Developer section of cPanel.net.





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