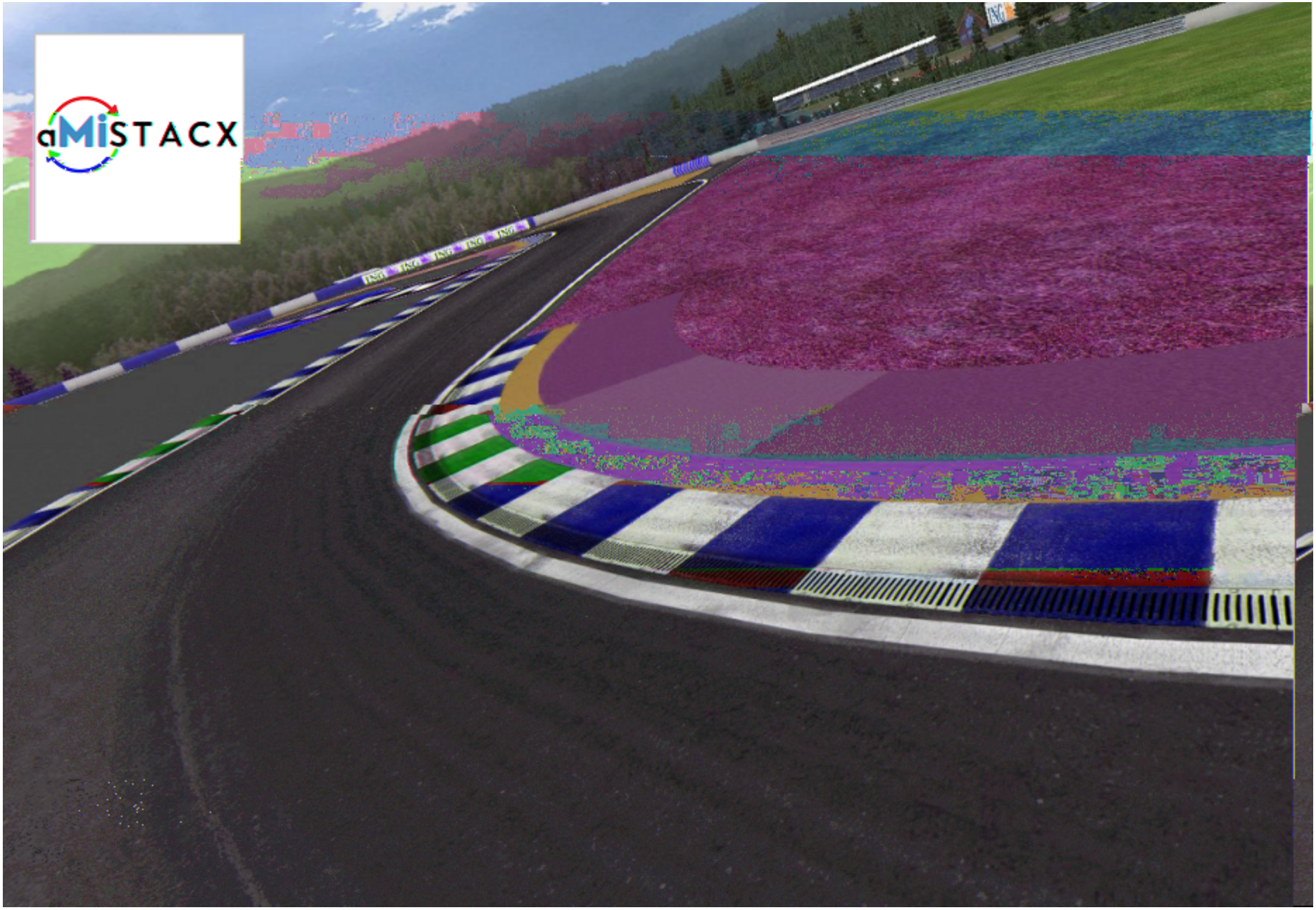


Simplicity & Performance - build your dream store with **aMiSTACX.**

Congratulations!

And welcome to your **Premium** aMiSTACX **F1 G3** Series - **WordPress 4.9.8 + WooCommerce** performance stack.

Important! As a supported managed service aMiSTACX will install and configure this AWS AMI stack for you should you not have enough experience with AWS hosting. Please contact support@amistacx.com to schedule.

or

DIY - As this stack was designed to be as automated as possible, with the least amount of steps required to get you up and running quickly, please follow the directions closely to ensure success.

It is best advised to get the product you purchased running per this documentation first! Then you have the option to customize your solution to your requirements.

These instructions for our stack assume the following:

- You have an **Intermediate** understanding of the AWS console
- You have an **Intermediate** skill level and/or experience with a Linux stack, and an **Intermediate** skill level with **WordPress**.
- You have a remote access SSH client, such as putty, and you understand how to create a ppk file from an AWS PEM file. These credentials will allow you to connect to your new aMiSTACX instance in your AWS availability zone.

WinSCP Sudo: https://amistacx.com/winscp-sudo-access-for-ubuntu-ami-stacx/
Putty to AWS: https://amistacx.com/how-to-use-putty-to-connect-to-aws/
How to generate a PPK file: https://amistacx.com/how-to-generate-a-ppk-file-for-ssh-and-sftp/

More Info on Putty/AWS: http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/putty.html

What's New in v2.0

- **Ubuntu Security Roll-ups & Package Updates**
- **PHP 7.3.0 [Default]**
- **WordPress 4.9.9 Core**
- **Fixed EC2 T3 Class Support**
- **Tweaks for Performance**

Full Change Log:

https://s3.amazonaws.com/amistacx.com/mp/stacx_change_logs/amistacx_wordpress_4.9.9_f1_g3_woo_change_log_v2.0.txt

WordPress EULA: https://s3.amazonaws.com/amistacx.com/mp/eula/amistacx_apache_wordpress_eula.txt

WordPress ® is a trademark of the WordPress Foundation.

I. Ubuntu 16.04.5 LTS Essentials

Core Software Versions

- **Ubuntu 16.04.5**
- **Apache 2.4.37**
- **PHP 7.0.33**
- **PHP 7.1.24**
- **PHP 7.2.15**
- **PHP 7.3.2 [Default]**
- **MySQL 5.7.25**
- **WordPress 4.9.9**
- **WooCommerce Plugin 3.5.3**
- **aMiSTACX Page Speed & Redis Purge 1.0.0**
- **phpMyadmin 4.5.4.1**
- **Redis 3.0.6**

PHP 7.x settings

/etc/php/7.3/fpm

memory_limit = 512M
upload_max_filesize = 150M
post_max_size = 151M
max_execution_time = 300

MYSQL [Non-default settings]

/etc/mysql/mysql.conf.d/mysqld.cnf

key_buffer_size = 32M
max_allowed_packet = 32M
thread_stack = 193K
wait_timeout = 300

innodb_buffer_pool_size = 256MB

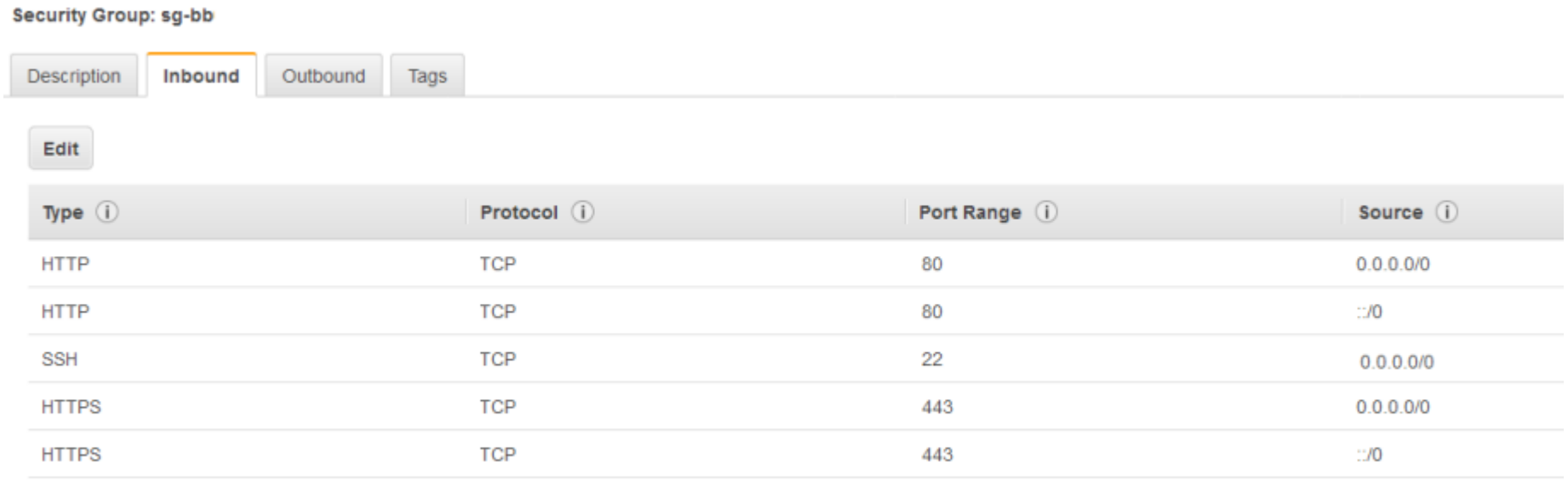
/etc/systemd/system/mysql.service.d/override.conf #Open File Increase

[Service]
LimitNOFILE=65535

III. AWS Security Group Confirmation

When first creating your EC2 stack, make sure your AWS security group [inbound] allows the following protocols and ports: SSH 22, HTTP* 80, HTTPS 443 incoming, TCP 8080.

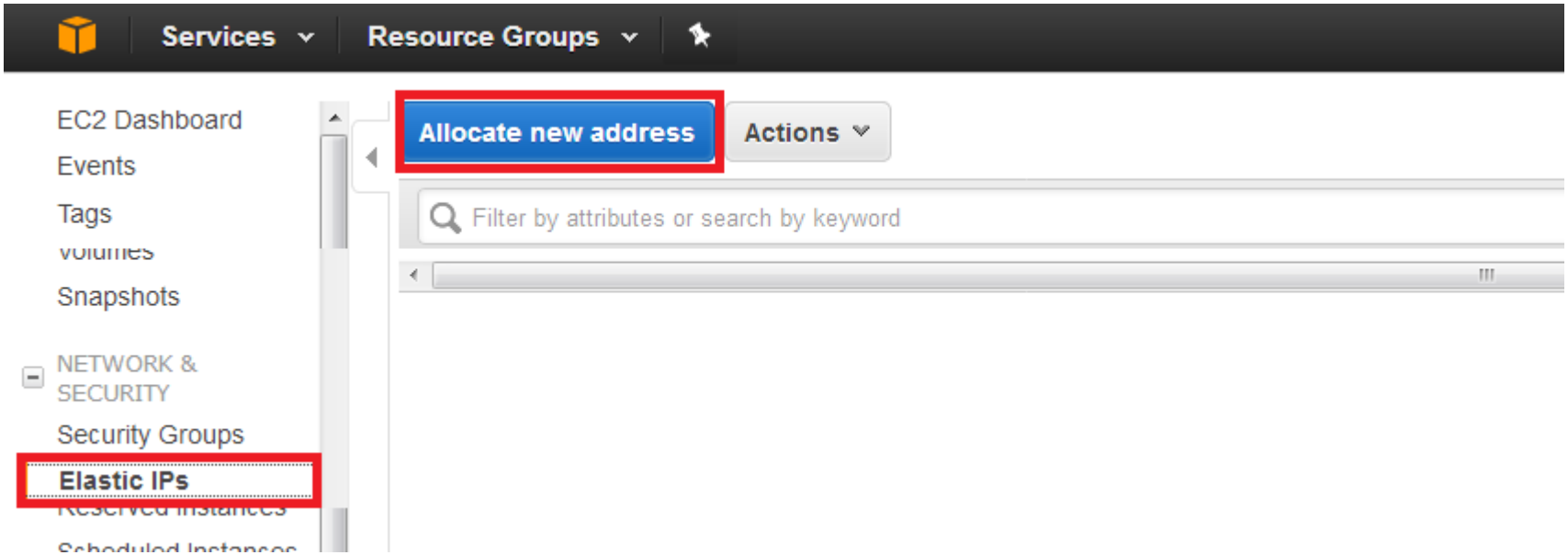
Note: It is recommended that you verify everything is working before changing the SSH to only allow specific connections.



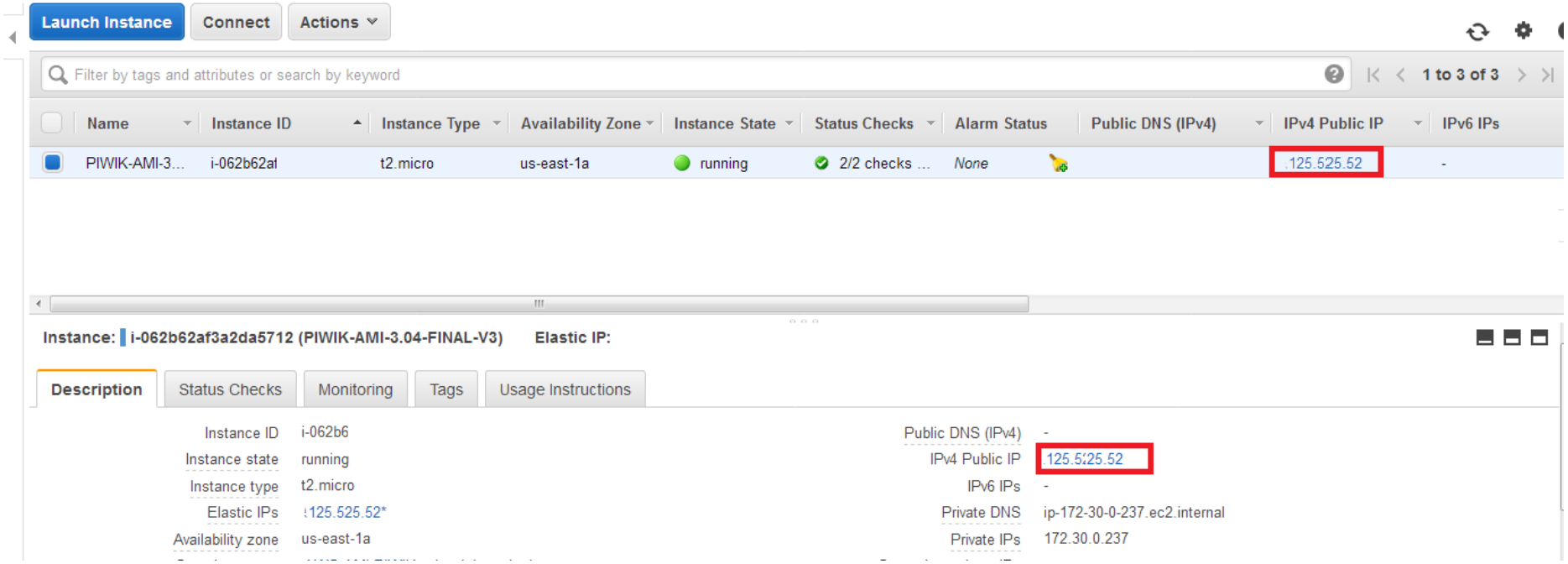
Note: F1-LAMP server uses a secure utility port of **8080** for phpmyadmin and documentation.

IV. AWS Elastic IP Address [Allocation]

It is strongly recommended that you create an AWS elastic IP address associated to this new EC2 build instance. This will allow you to start and stop without having to update public IP address connection information.



V. AWS Public IP Address [Setting]



After your image is built, first confirm you can access SSH, HTTP, and HTTPS.

Your IP address is the elastic public IP address. You use this for DNS and for SSH.

To check HTTP: **Http:<AWS_Public_IP_Address>/**

To check HTTPS: **Https:<AWS_Public_IP_Address>/**

Note: You will need to add an exception for HTTPS as you are using a self-signed cert.

VI. DNS CloudFlare

CloudFlare [Easy to configure]

Our instructions use DNS/CDN provider CloudFlare for examples, and is recommended for users with basic to intermediate Administration/Networking skills.

CF offers a great easy to use DNS service, that is very user friendly, is **Free** to use for basic features.
It's a great starting point to get up and running quickly!

https://www.cloudflare.com/plans/

Note: The CloudFlare Free plan has a restriction of **100MB** file uploads through their CDN. You can use CloudFlare for DNS only, but if your require file uploads on your site from your customers that exceed 100MB, then you will have to upgrade to a paid plan.

AWS Route 53 + CloudFront [Higher skill level required to configure]

Should you want to use AWS CDN CloudFront then it is highly recommended you stick with Route 53 to handle your DNS.

VII. Recommended Stack Configurations [Optional - For advanced Linux Users]

Note: Should you want to use a DNS friendly name and real SSL cert, follow directions in this section; otherwise, you may proceed with the next section.

Friendly DNS Name w/ Domain or Subdomain

[**Note:** It is important that you consider using a subdomain as you may want to use a free certificate(s) from Let's Encrypt and they do not offer wildcard certs - yet! This stack is configured to use Let's Encrypt. For example, www is considered a subdomain, and if you wanted to use both www and yourdomain.com you would require two certificates.]

In conjunction with external DNS, if want you to use a friendly name, you will need to access the server via SSH and use the ubuntu user to sudo to update the following:

1A. Subdomain: [Example. www.yourdomain.com]

sudo nano /etc/apache2/sites-available/wordpress.conf

Un-comment line "remove #" and update to ServerAlias ***subdomain***.**example.com** **[where example.com = your domain name]**

sudo nano /etc/apache2/sites-available/wordpress-ssl.conf

Un-comment line "remove #" and update to ServerAlias ***subdomain***.**example.com** **[where example.com = your domain name]**

Save files! And from from CLI: **sudo service apache2 restart**

1B. Point external A record DNS to your new subdomain > ***subdomain***.example.com

2A. Domain: [Example. example.com]

sudo nano /etc/apache2/sites-available/wordpress.conf

Un-comment line “remove #” and update to ServerName ***example.com*** **[where example.com = your domain name]**

sudo nano /etc/apache2/sites-available/wordpress-ssl.conf

Un-comment line “remove #” and update to ServerName ***example.com*** **[where example.com = your domain name]**

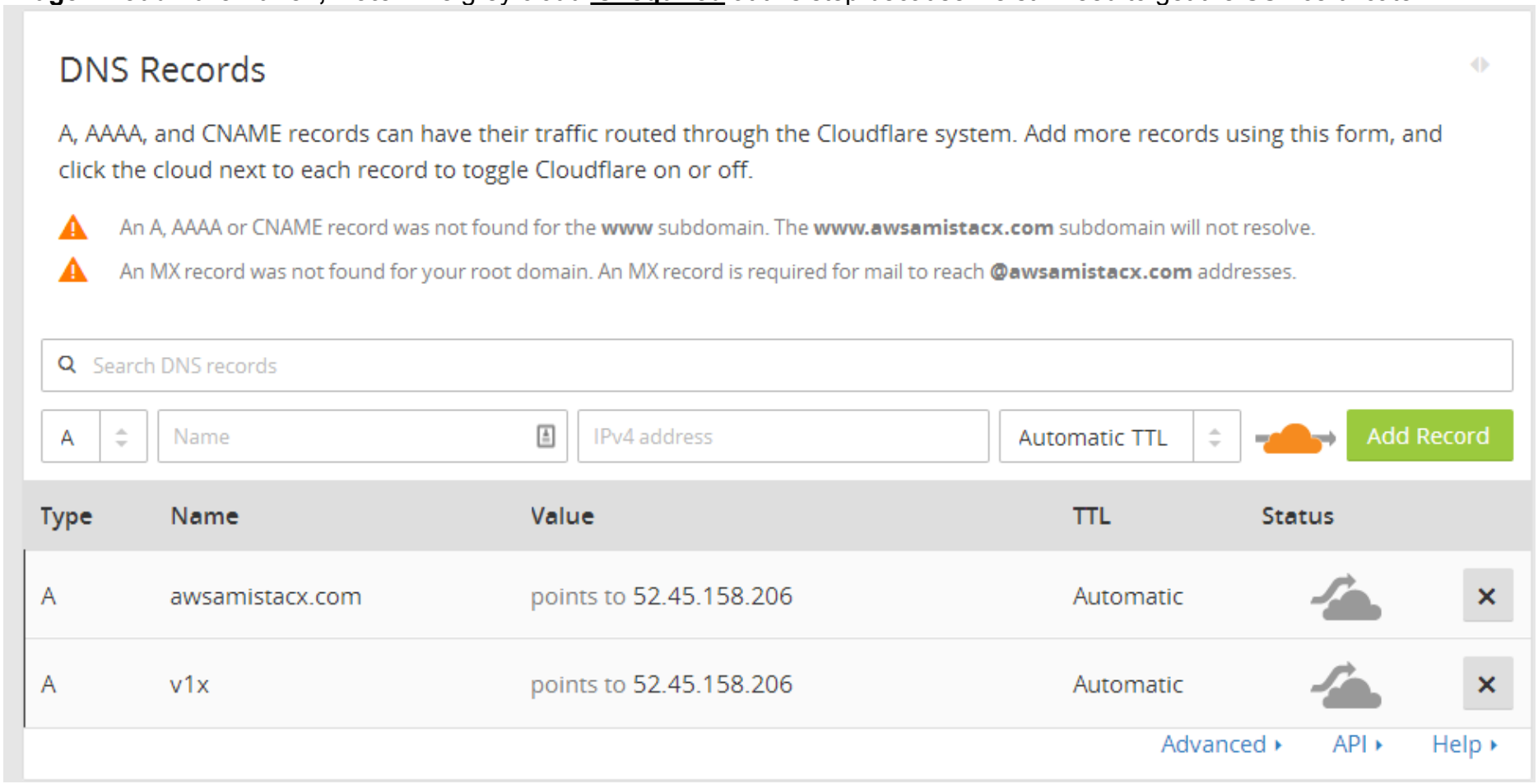
Save files! And from from CLI: **sudo service apache2 restart**

<Continued>

2B. Point external DNS A record to your new subdomain > *subdomain*.example.com

e.g.

Image: CloudFlare Panel ; Note: The grey cloud **<u>is required</u>** at this step because we still need to get the SSL certificate.



VIII. SSL Configuration [Optional]

A note about TLS Certificates for HTTPS. Should you run a high volume ecommerce site that can not afford any downtime, and you are in a LAMP/LEMP configuration, then you should consider opting to purchase a certificate.

Using Let's Encrypt for a free cert is great, but if you select to use the CloudFlare CDN, then every 90 days you will need to take your server offline for a minute or two to renew your certificate. Certbot will not auto-renew on the CDN, and also even if you flipped the CDN to off and renewed your certificate you still need to reload the Apache service.

Unless your server is stateless and you have multiple servers in a farm, then you will experience downtime.

CloudFlare Option A:

This product comes with a dummy SSL certificate. Should you want to utilize a free CloudFlare plan as a front-run DNS and CDN provider - HIGHLY RECOMMENDED - then you can use their flexible SSL to map to the Dummy SSL without any additional SSL local configurations! Or you can request a certificate from Let's Encrypt - HIGHLY RECOMMENDED.

https://www.cloudflare.com/plans/

Sign up, add your domain, have CF host your DNS, create a subdomain or domain mapping to your AWS elastic IP address. For Example, ***subdomain.example.com*** or ***example.com***

Note: This Stack is CloudFlare Aware! You do not need to make any modification to see visitors IP addresses should you use this stack for Matomo Analytics.

Option B. Full Paid Certificate

An alternative to Let's Encrypt Free Certificates is to use a purchased certificate. The advantages of a purchased certificate from a provider such as Comodo or Verisign are many.

With Let's Encrypt, you have to take your server offline for a minute every 90 days as the certs come up for renewal. The reason is if your server is on a CDN [it should be] then the standardized renewal cron request process will fail. Additionally, even if the server was able to renew the request, the Apache service would still need to be restarted. [Not ideal in any e-commerce solution.]

So here we will cover just a very basic certificate installation process on Apache. There are thousands of articles covering this process in depth, so here we seek brevity.

Please see our site for the full procedure.

https://amistacx.com/ubuntu-16-04-apache-2-4-generate-certificate-signing-request/

Let's Encrypt Option C:

Note: Before you begin - DNS must resolve! In other words, http://subdomain.example.com or http://example.com must resolve correctly to your AWS elastic public IP address. Let's Encrypt requires this otherwise the process will fail.

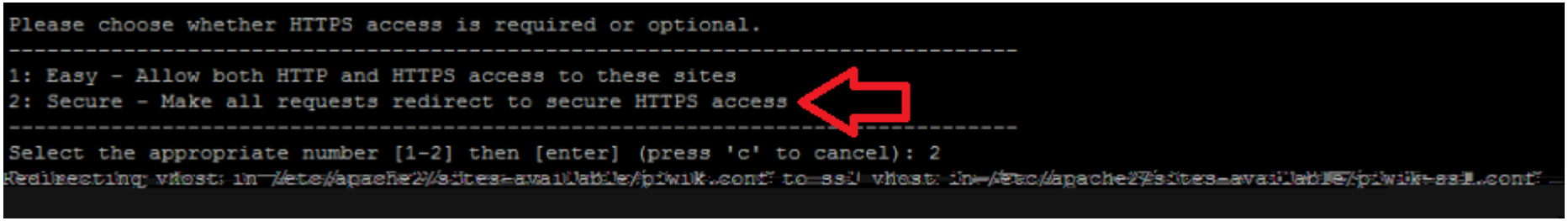
After confirming the DNS, to get your free certificate from let's encrypt - CLI:

sudo certbot-auto --apache -d *example.com*

Or

sudo certbot-auto --apache -d *subdomain.example.com*

Select Option 2. Make all requests redirect to HTTPS



Note: The cert expires every 90 days, you will need to set up a cron job to renew.

Note: Troubleshooting CloudFlare TLS HandShake Error:

Should you get a TLS handshake error, please review this article.

https://amistacx.com/lets-encrypt-tls-handshake-failure/

D. Let's Encrypt "*" Wildcard Certs:

Let's Encrypt as of January 2018 offers wildcard certs. Our stacks are compatible; however, there is some DNS legwork that must be performed. Please see the how to article on our site:

https://amistacx.com/lets-encrypt-wildcard-certs-on-ubuntu-16-04/

E. Cron Setup [Required for Let's Encrypt]

To run the renewal cert check daily, we will use cron, a standard system service for running periodic jobs. We tell cron what to do by opening and editing a file called a crontab.

sudo nano /etc/crontab -e

Your text editor will open the default crontab which is a text file. Paste in the following line at the end of the file [as shown], then **save** and close it, and reload:

11 4 * * * root /usr/bin/certbot-auto renew --quiet

sudo /etc/init.d/cron reload

The 11 4 * * * part of this line means "run the following command at 4:11 am, every day". You may choose any time.

```
SHELL=/bin/sh
PATH=/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin

* * * * * www-data /usr/bin/php /var/www/magento/bin/magento cron:run | grep -v "Ran jobs by schedule"
* * * * * www-data /usr/bin/php /var/www/magento/update/cron.php >> /var/www/magento/var/log/update.cr
* * * * * www-data /usr/bin/php /var/www/magento/bin/magento setup:cron:run >> /var/www/magento/var/lc


# m h dom mon dow user  command
17 *  * * * root    cd / && run-parts --report /etc/cron.hourly
25 6  * * * root  test -x /usr/sbin/anacron || ( cd / && run-parts --report /etc/cron.daily )
47 6  * * 7 root  test -x /usr/sbin/anacron || ( cd / && run-parts --report /etc/cron.weekly )
52 6  1 * * root  test -x /usr/sbin/anacron || ( cd / && run-parts --report /etc/cron.monthly )
11 4  * * * root  /usr/bin/certbot-auto renew --quiet
#
```

The renew command for certbot-auto will check all certificates installed on the system and update any that are set to expire in less than thirty days. --quiet tells Certbot not to output information nor wait for user input.

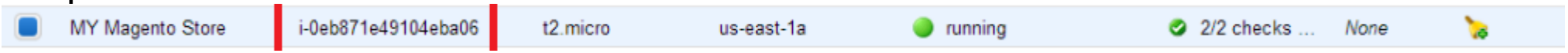
Note: Make sure outbound HTTP is open as the cron will poll the remote cert source via the cron job. This is normally the default from the AWS security group. Allowing ALL.

IX. MySQL 5.7 Connection information

Login = root
Password = your AWS Instance ID

Password is your EC2 **Instance ID**. From AWS Web Console, or obtain via CLI: **~$ ec2metadata --instance-id**

Example from AWS console:



IMPORTANT! Please store this password in a safe location as you may later change EC2 instance IDs, and forget your password.
Note: You would also use these very same credentials to access the database through phpMyadmin.

https://Your_AWS_Public_IP_or_Hostname:8080/phpmyadmin/

NOTE: Make sure you include the "/" at the end of the phpmyadmin URL.

X. Email Configuration

Postfix is installed but is **not** configured!

It is advised should you use our stack for WordPress, Magento, or other CMS, using an SMTP plugin that makes life a lot better and a lot easier to configure. ;-)

However, postfix allows the server to send mail in default configuration. E.g. password reset email.

Ref. https://help.ubuntu.com/community/Postfix
Ref: https://aws.amazon.com/workmail/

XI. WordPress Install 4.9.x [Part I]

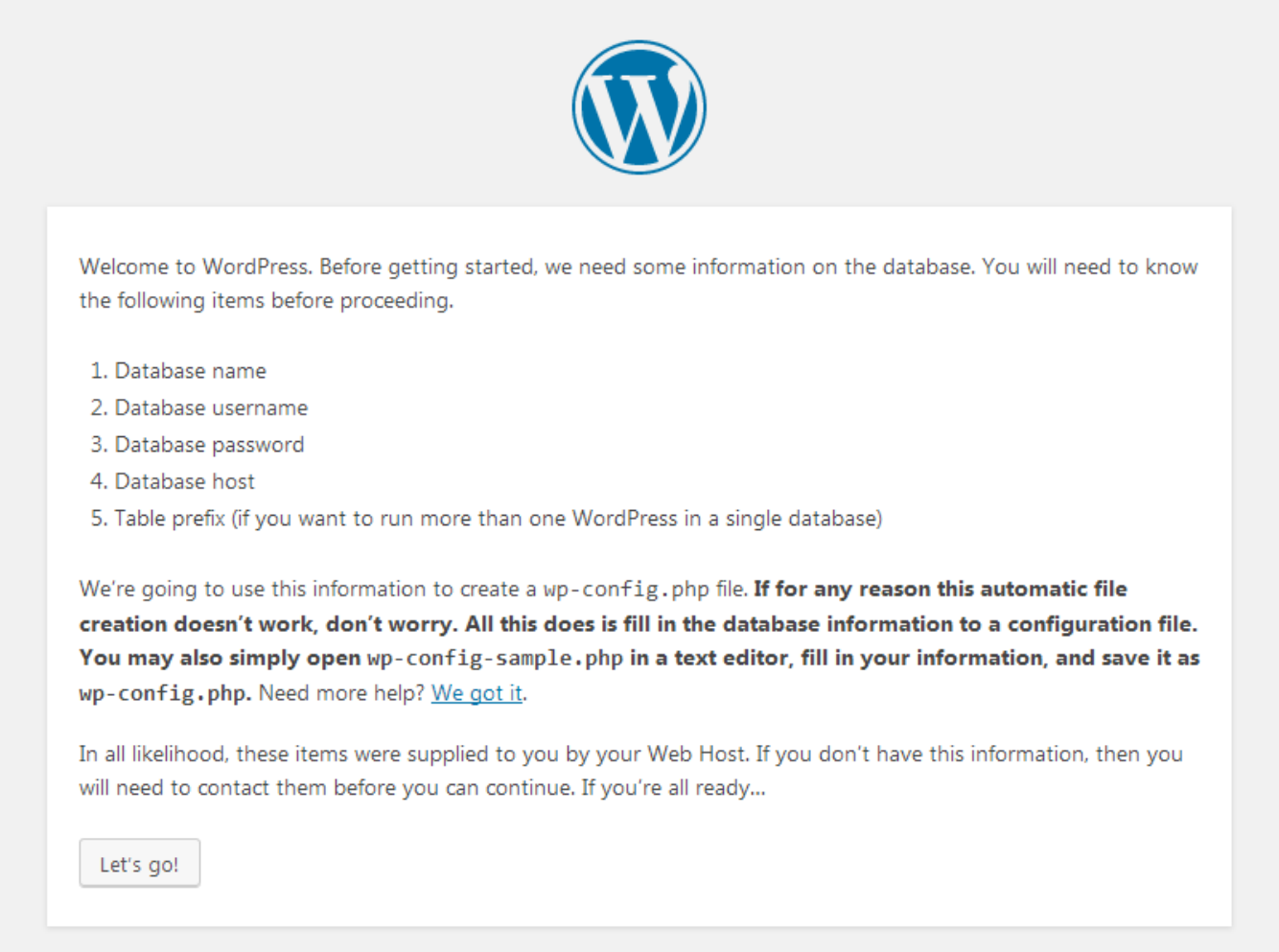
With DNS configured and an SSL certificate assigned it is time to proceed with the WordPress setup.

http{s}://**subdomain**.example.com **or** **http{s}://example.com**

http{s}://<youripaddressordomain>/wp-admin/install.php

>>Select your language.

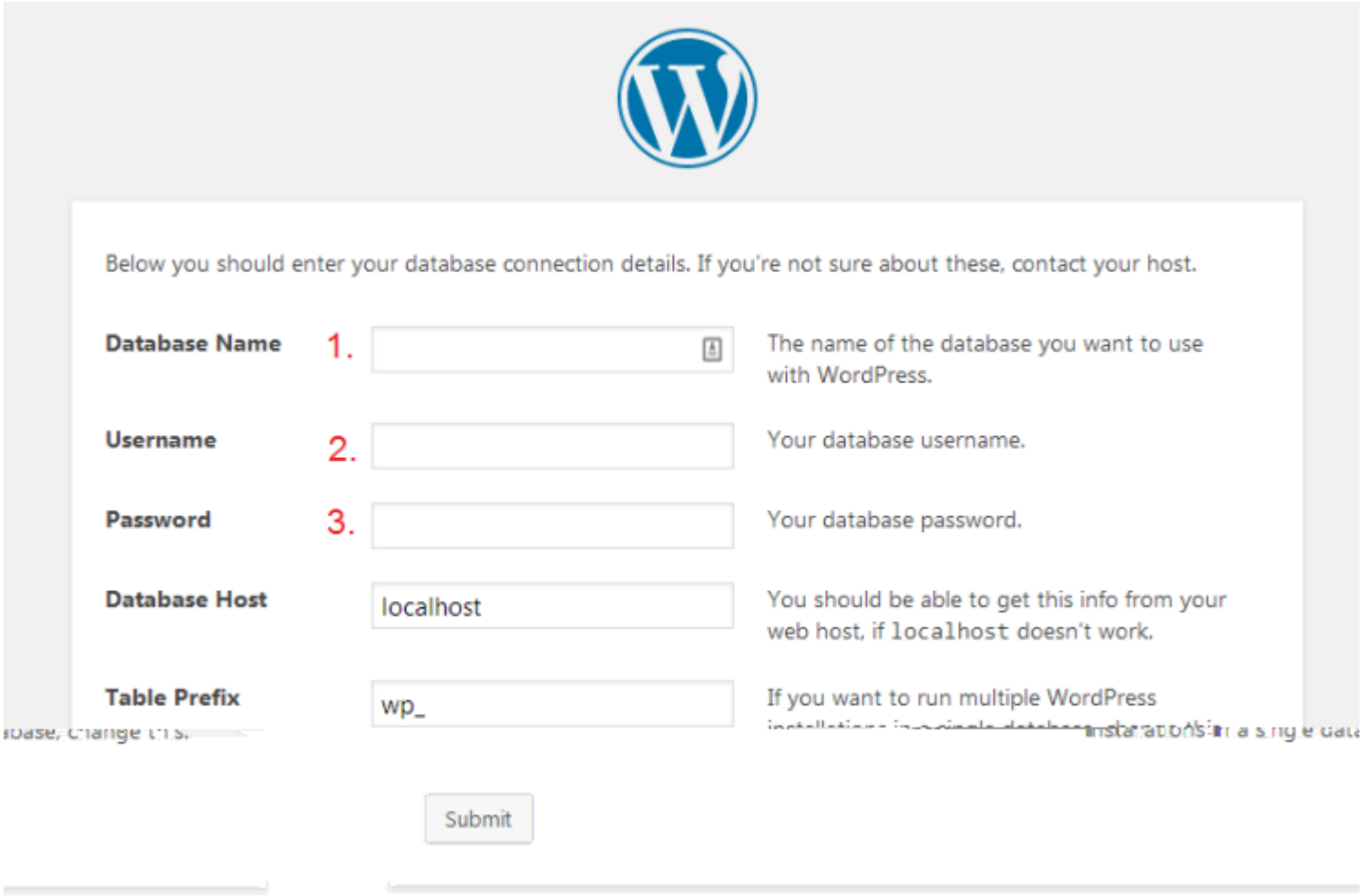
>> Review and then Select "**Let's Go**"



Fill in the database information.

User: root ; Password: {EC2 Instance ID} ; Database: wordpress

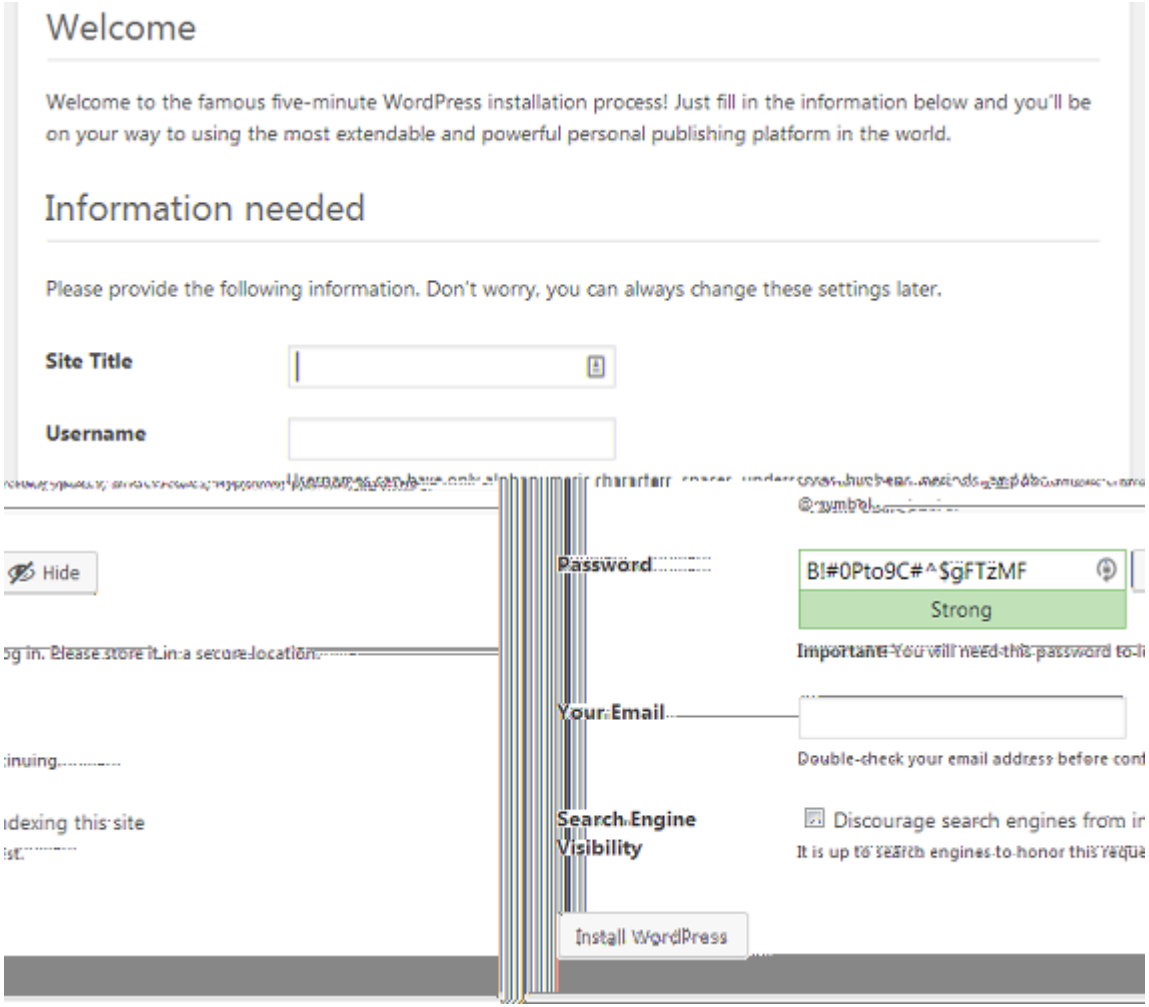
>>Click "**Submit**" when finished.



Enter Site Title, Create your WP Site Admin Username, and **Copy the password**. **Enter your Real email address**.

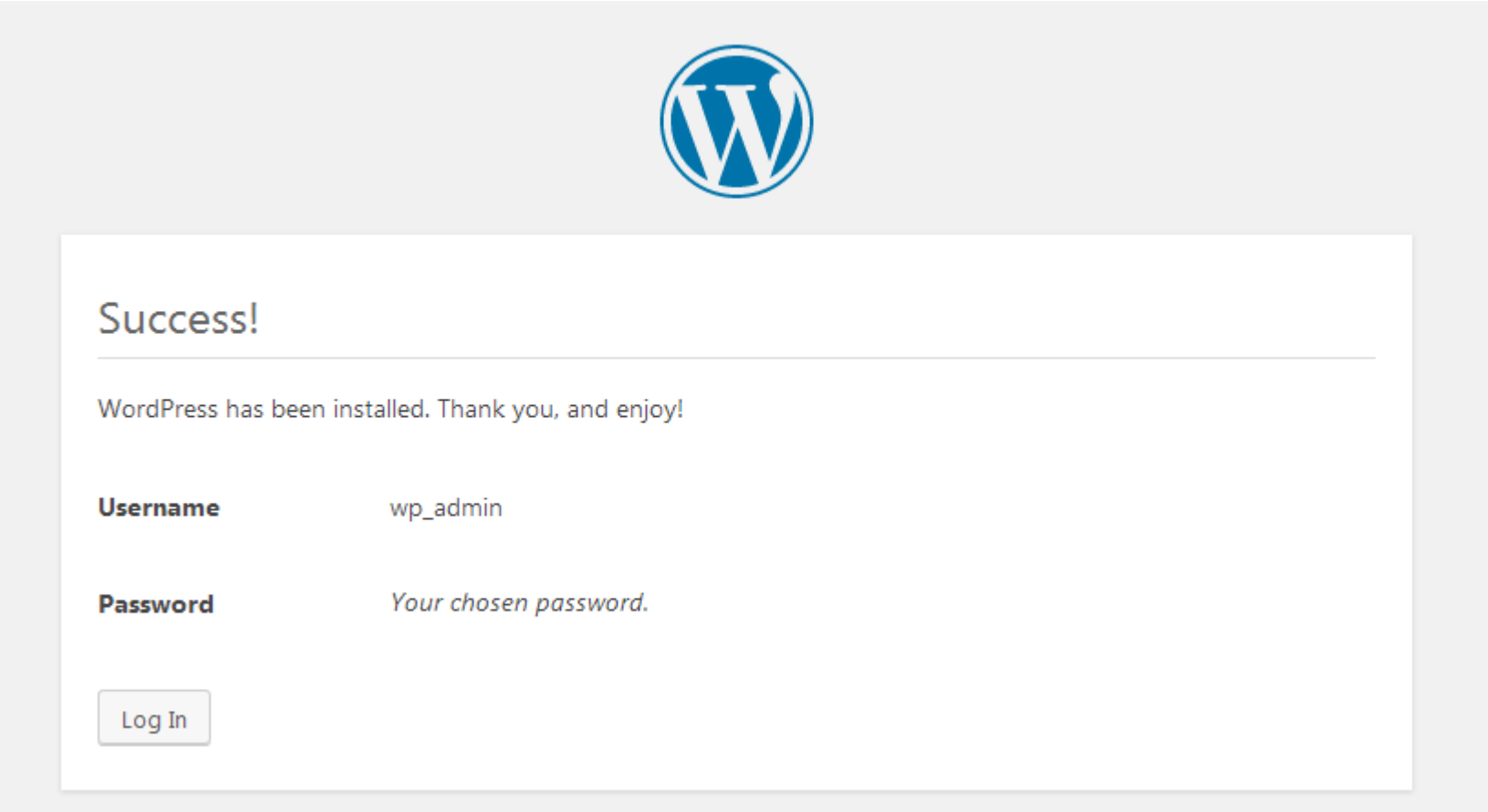
Note: This is your WordPress Admin, and different from your MySQL admin. Do not use the same information for both.

>>Select "**Install WordPress**"



You’re finished! Yay :)

>>Click “**login**” to configure your WordPress site. To access the Admin Panel: **http{s}://<youripaddressordomain>/wp-login**



Your new site welcome screen with default WordPress theme:

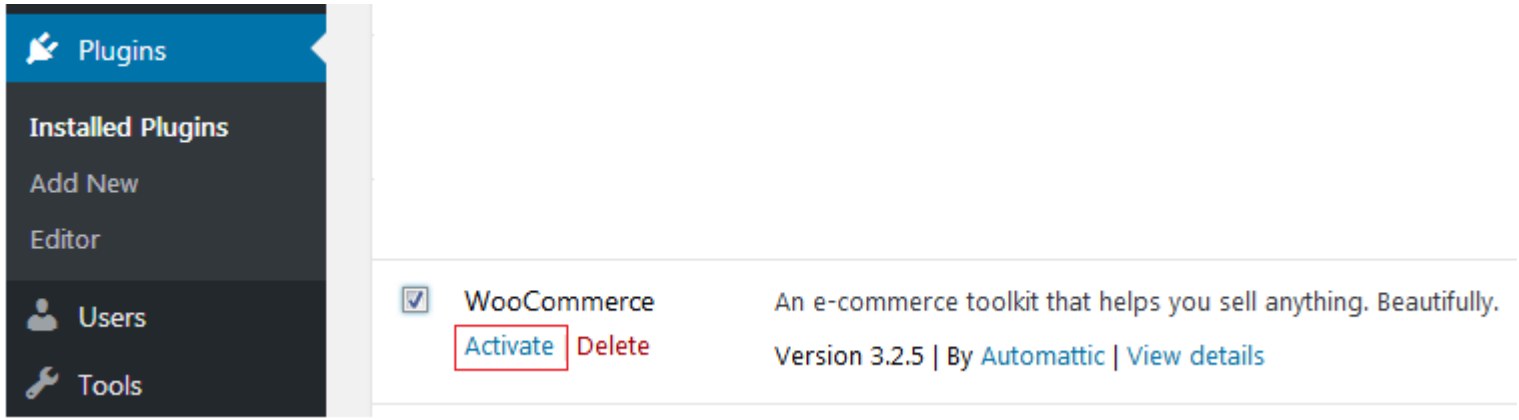
http{s}//yourdomain_or_ipaddress

XII. WooCommerce Plugin 3.5.3 [Activate & Configure]

1. Log into WP-Admin Panel

2. Navigate to Plug-ins in WP Main Menu
>>Activate WooCommerce

Ref: **https://wordpress.org/plugins/woocommerce/**



Note: Please review the WooCommerce configuration guide.

Ref: https://docs.woocommerce.com/document/woocommerce-setup-wizard/

XIII. Post Install - WordPress Upgrade Options

Note: Before you upgrade, you may want to consider making an AWS EC2 backup image of your completed stack so you do not have to go through the build process again should you encounter an issue with an upgrade.

Important: Before you upgrade, check any plugins that in use for compatibility with your new version. Same goes for any custom theme you may be using.

1. From within the WordPress dashboard select upgrade to **4.9.x**
2. After upgrading WordPress, you may want to also upgrade any plugins to their latest supported version.

XIV. Performance Tuning; Part I - It's All about the Cache

As you know, this stack is designed for speed! This **F1** stack can score high 90's from Pingdom, GTMetrix, and Google Insights using the default **WordPress and/or WooCommerce Storefront** theme.

As shown here in the demo: https://woo.awsamistacx.com/

However, you need to understand that you are caching objects to client browsers, and if you use CloudFront or CloudFlare, you have to understand you are caching and understand headers. aMiSTACX has pre-configured the vhost for 80 and 443 to use the **cache-control header with max age**. Adjust as required.

Note: Headers Module is now **enabled** by default. Should you no longer want to use the module for any reason, you will need to disable the module.

IMPORTANT! If you use CloudFlare CDN, please do A/B testing. We have observed instances where the CDN was slowing down the performance of our stacks.

Note: Turning off Rocket Loader™ may increase quality scores on some speed test sites - such as worldpagetest.org

You still can use CloudFlare for basic DNS, but you will need to set your domain to "grey" cloud, meaning CDN off. When toggling CF On and Off, please wait at least 5-10 minutes between testing cycles.

Part II - Google PageSpeed for Apache [Optional]

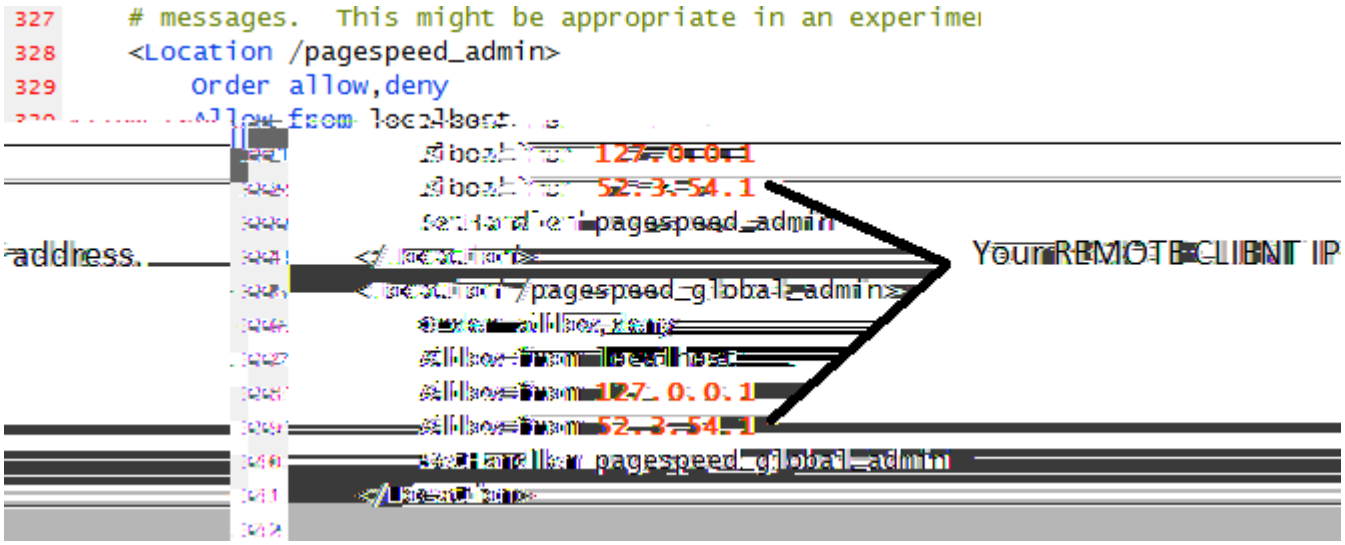
The Google PageSpeed module is installed and **disabled** by default as it actually may slow the server. Caching is beyond the scope of this guide and is up to the customer to implement correctly. Components are only provided as a convenience.

/etc/apache2/mods-available/pagespeed.conf

You have the option to turn On the PageSpeed module [Line 4], and you can also set the remote access to the admin panel.

To access remote access panel:

Step 1. Add these lines and add your client IP address.



Step 2. Uncomment line 348 and add your domain or IP address.

```
346
347     ModPagespeedRewriteLevel OptimizeForBandwidth
348     #ModPagespeedDomain https://example.org
349     ModPagespeedEnableFilters responsive_images,resize_images,lazyload_images,convert_jpeg_to_progressive
350     ModPagespeedEnableFilters combine_css,prioritize_critical_css,rewrite_css,fallback_rewrite_css_urls
351     ModPagespeedEnableFilters canonicalize_javascript_libraries,rewrite_javascript,defer_javascript
352     ModPagespeedEnableFilters collapse_whitespace,extend_cache,trim_urls
353     ModPagespeedForceCaching on
354     ModPagespeedEnableCachePurge on
355
```

Step 3. Restart Apache and to access then from a browser:

e.g http://{Your_AWS_IP_Hostname}/pagespeed_admin

Ref: https://www.modpagespeed.com/doc/configuration

Part III - aMiSTACX PageSpeed WordPress Purge Module [Optional]

The aMiSTACX PageSpeed & Redis Purge Plugin module is installed and **disabled** by default.

To make use of this plugin PageSpeed need to be properly configured!

To access remote access panel:

Step 1. Add these lines and add your **AWS Public EC2 server IP address,** and as an option your client IP address.

/etc/apache2/mods-available/pagespeed.conf

```
327     # messages.  This might be appropriate in an experimer
328     <Location /pagespeed_admin>
329         Order allow,deny
330         Allow from localhost
331         Allow from 127.0.0.1
332         Allow from 52.3.54.1
333         SetHandler pagespeed_admin
334     </Location>
335     <Location /pagespeed_global_admin>
336         Order allow,deny
337         Allow from localhost
338         Allow from 127.0.0.1
339         Allow from 52.3.54.1
340         SetHandler pagespeed_global_admin
341     </Location>
342
```

Your AWS Public IP Address and [optional] your Client IP Address.

Step 2. Uncomment line 348 and add your domain or IP address.

```
346
347     ModPagespeedRewriteLevel OptimizeForBandwidth
348     #ModPagespeedDomain https://example.org
349     ModPagespeedEnableFilters responsive_images,resize_images,lazyload_images,convert_jpeg_to_progressive
350     ModPagespeedEnableFilters combine_css,prioritize_critical_css,rewrite_css,fallback_rewrite_css_urls
351     ModPagespeedEnableFilters canonicalize_javascript_libraries,rewrite_javascript,defer_javascript
352     ModPagespeedEnableFilters collapse_whitespace,extend_cache,trim_urls
353     ModPagespeedForceCaching on
354     ModPagespeedEnableCachePurge on
355
```

Note: If you use HTTPS, then the hostname needs to match the server certificate. If not you will get a cURL warning when purging the PageSpeed cache using the plugin.

Step 3. Restart Apache

```
sudo service apache2 restart
```

Step 4. Edit your WordPress .htaccess file and configure like this:
[Assuming Fresh install.]

```
# BEGIN WordPress
<IfModule mod_rewrite.c>
RewriteEngine On
RewriteBase /
RewriteRule ^index\.php$ - [L]
RewriteCond %{REQUEST_URI} !pagespeed
RewriteCond %{REQUEST_FILENAME} !-f
RewriteCond %{REQUEST_FILENAME} !-d
RewriteRule . /index.php [L]
</IfModule>
# END WordPress
```


Step 5. [Optional] Assuming you added client IP address in step 1. Access PageSpeed Admin Panel then from a browser:

e.g http://{Your_AWS_IP_Hostname}/pagespeed_admin

Ref: https://www.modpagespeed.com/doc/configuration

XV. How to switch PHP versions [Example]

[Applies to 7.0 -7.3]

To Switch to php 7.0 from php 7.1:

- Disable FPM Service for PHP 7.1
  sudo service php7.1-fpm stop

- Since we want 7.0 as the default, Disable 7.1 FPM Service on Startup
  sudo systemctl disable php7.1-fpm

- Double-Check, but these should already be Disabled
  sudo a2dismod php7.2
  sudo a2dismod php7.1
  sudo a2dismod php7.0

- Verify Apache Config for 7.0 is Active One
  sudo a2disconf php7.1-fpm.conf
  sudo service apache2 restart
  sudo a2enconf php7.0-fpm.conf
  sudo service apache2 restart

- Restart PHP 7.0 FPM Service and Enable on Startup
  sudo systemctl enable php7.0-fpm
  sudo service php7.0-fpm restart

  sudo service apache2 restart

  sudo update-alternatives --set php /usr/bin/php7.0

- Verify PHP 7.0 with Opcache
  php -version

- Double-Checking Services Running
  systemctl status php7.0-fpm
  systemctl status apache2

XVI. What's Next?

Be sure to checkout our WordPress and main site for tips and assistance.

https://amistacx.com/wordpress/

https://amistacx.com

- **Register for Area 51 Management Dashboard**
- **Create a FULL AMI Image/Snapshot backup**
- **Consider updating the Ubuntu System Files and add the latest Security patches.**

Note: Make a full backup first!

From CLI

sudo apt-get update
sudo apt upgrade
sudo apt autoremove

XVII. Post Install Security

1. Lock-down https://<yourdomain>:8080/phpmyadmin

For a production environment, it is strongly suggested you implement a second level of security on the phpMyadmin URL by using AWS Security Group IP policies to restrict access.

2. SSH Security Group

Consider restricting access to the SSH port via your AWS security group. As per the below article outlines.

https://amistacx.com/restrict-access-to-ssh-with-aws-security-groups/

3. Two-Factor Authentication [Activate]

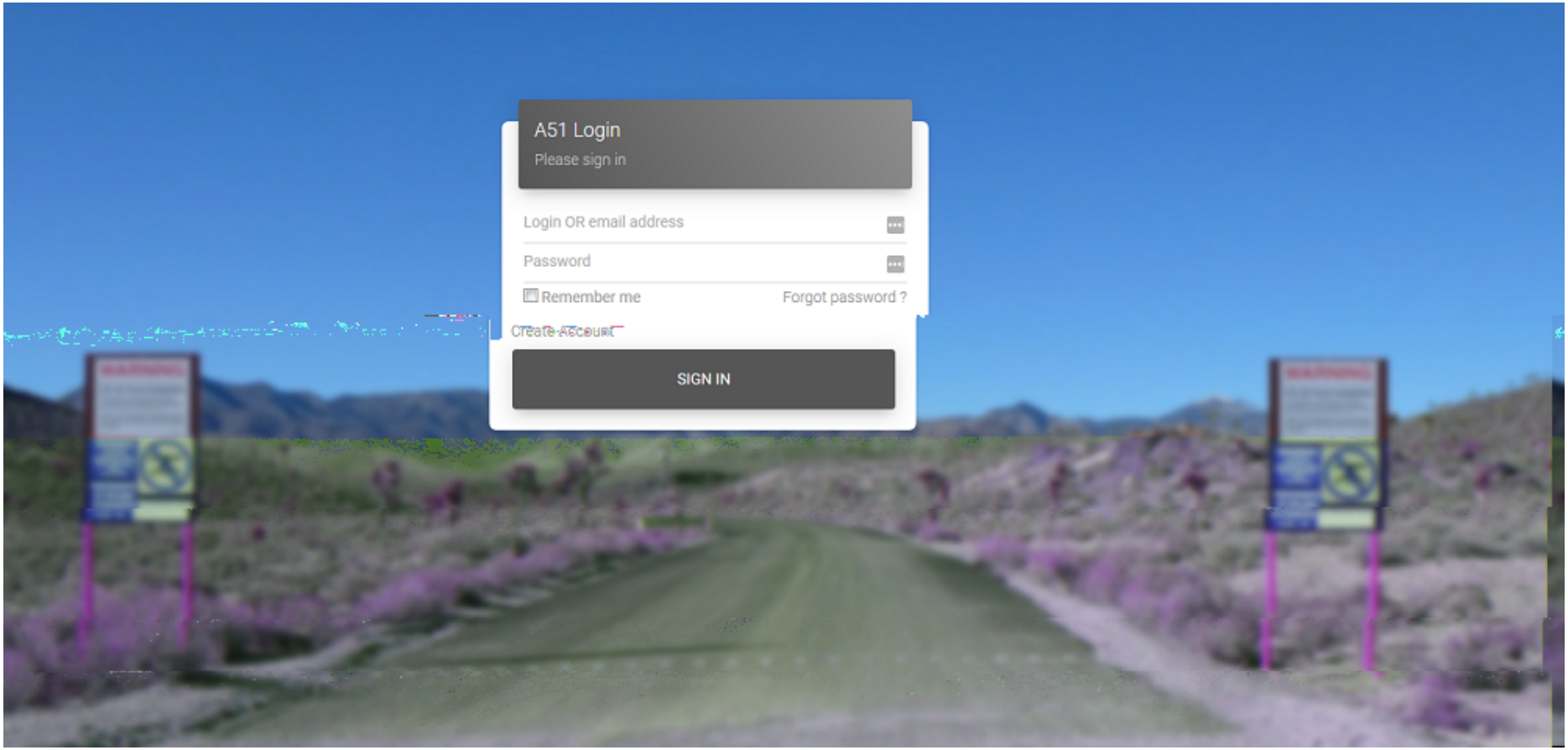
We have pre-loaded a two-factor authentication plugin. You may want to consider activating it for additional security to the WordPress Admin console. Please review the plugin's documentation prior to activation.

Tip: If you need to reset your group/user permissions and folder/file permissions back to the aMiSTACX default:

sudo chmod -R u+rwX,go+rX,go-w /var/www/wordpress

sudo chown -R www-data:www-data /var/www/wordpress

XVIII. Area 51 aka A51 Dashboards [Registration]



A51 dashboards will allow a centralized external management of aMiSTACX resources on AWS. You must have aMiSTACX EC2 servers in order to make use of the A51 dashboard product.

Simply click “Create Account” from the login screen and follow the onscreen prompts.

More details and updates can be found at https://amistacx.com/area-51-aws-management-console/
A51 Guide: https://s3.amazonaws.com/amistacx.com/mp/stacx_a51/A51-dashboards-documentation.pdf

XIX. Support

Should you need help or have questions, please reach out to support. We will do our best to respond within 24hrs, and if you can't wait you can try our AI Macey-Bot. She's available 24/7/365, and she's good :)

Home & KB: https://amistacx.com

Thanks for selecting **aMiSTACX** as your Premium AWS EC2 stack provider. **Better - Stronger - Faster!**