

# HDX-DEV-200

## Theme Development

HCLSoftware U

Creating a new generation of experts

Edition: January 2025

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## Table of Contents

Author(s) .....	3
Introduction .....	4
Prerequisites .....	5
Lab Overview .....	6
Part 1: Add new Top Column 2 Column Equal Layout.....	8
Part 2: Add new Black and Red Styles .....	12
Part 3: Discover Navigation Bar Module options and update Profile to Compressed one.....	15
Part 4: Use Theme Optimization Analyzer to Debug .....	18
Conclusion .....	25
Resources .....	26
Legal statements.....	27
Disclaimers .....	28

## Author(s)

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**Company:**  
**HCLSoftware**

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### Introduction

This hands-on lab guides you through adding a style to and debug a theme on HCL Digital Experience (DX). The theme manages the overall look & feel and layout of your page. In this lab, you will explore how to easily add layouts and styles to your DX theme, and use the Theme Analyzer to debug it.

In this DX developer lab, you play the role of Gene, a developer for the fictitious Woodburn Studio company.



**Gene Hayes, Developer, based in Chicago (USA)**

As a Web Developer, you will add a new layout and two styles to your **HCL DX Theme** theme you created before in HDX-DEV-100 Theme Development. Then you will also discover how modules are created and used and use the Theme Optimization Analyzer to enable debugging.

## Prerequisites

1. Completion of [HDX-INTRO](#), [HDX-BU-100](#), [HDX-BU-200](#) and [HDX-DEV-100](#) courses, including the labs
2. An HCL DX Theme created using the Simple Theme template. See [HDX-DEV-100 Theme Development lesson](#) lab parts 1 and 3 to learn how to create and manage this locally.
3. Access to download the Lab Resources. In the same place where you have found this lab, you will find corresponding resources which you may download and unzip in your Desktop. This helps you to run the lab more easily, and you may later replace them by your own ones.
4. A local code editor. This lab provides instructions with Visual Studio Code (VSC): <https://code.visualstudio.com>.
5. DXClient deployed and configured. See [HDX-DEV-100 Introduction](#) lesson to learn how to set this up.

You will be using the following user IDs and passwords:

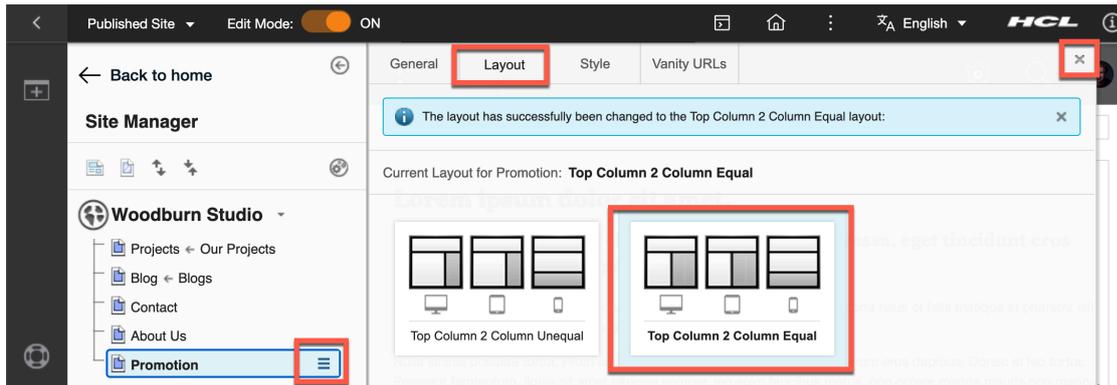
Purpose	User	Password
SoFy Login	Your official email id	Your password
Developer Gene Hayes	ghayes (or wpsadmin)	HCL-Dem0 (or wpsadmin)

## Lab Overview

In this lab you will continue working on the theme you created earlier in HDX-DEV-100 Theme Development and used in a fictional website: Woodburn Studio, but you can also use your own. In this lab, you will add a layout and two styles to it, discover and use modules and learn to debug it using the Theme Analyzer.

### Part 1: Add new Top Column 2 Column Equal Layout

As Gene, the DX developer, you want to allow your site managers to choose a Top Column 2 Column Equal page layout and create, add this to your theme

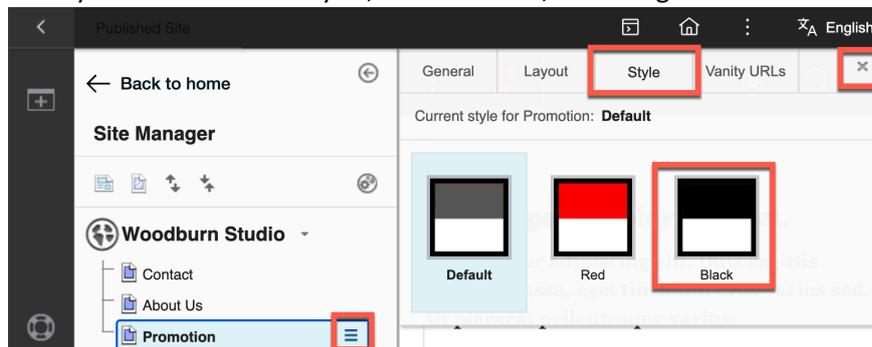


and try it out.



### Part 2: Add new Black and Red Styles

Then you add two extra styles, black and red, to manage the header banner background color

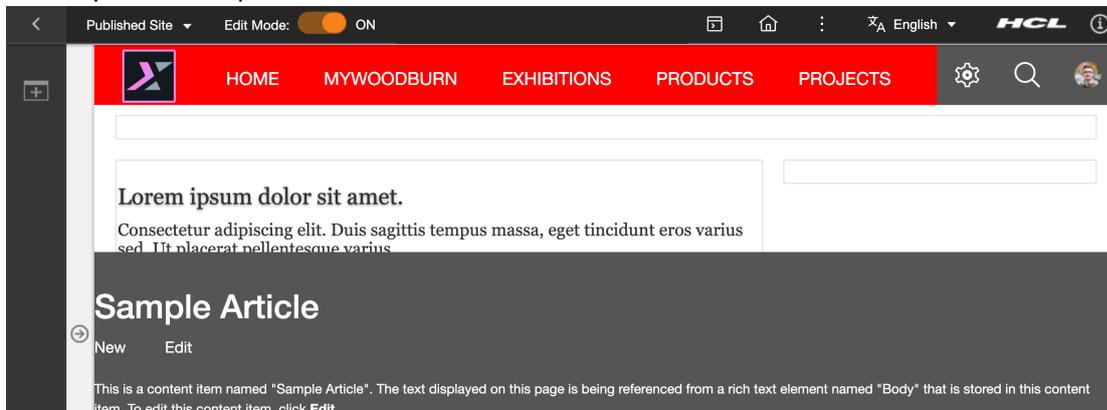


and try them out.



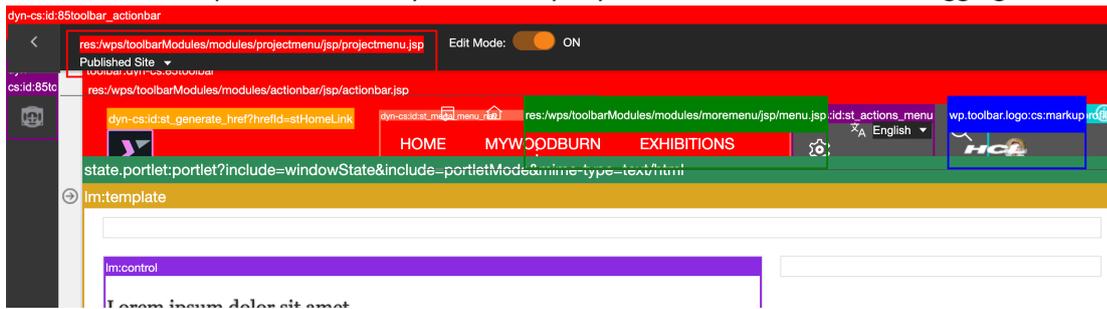
### Part 3: Discover Navigation Bar Module options and update Profile to Compressed one

Learn on how modules are used, by comparing two navigation bar modules and apply the compressed one to your theme profile that fixes the footer.

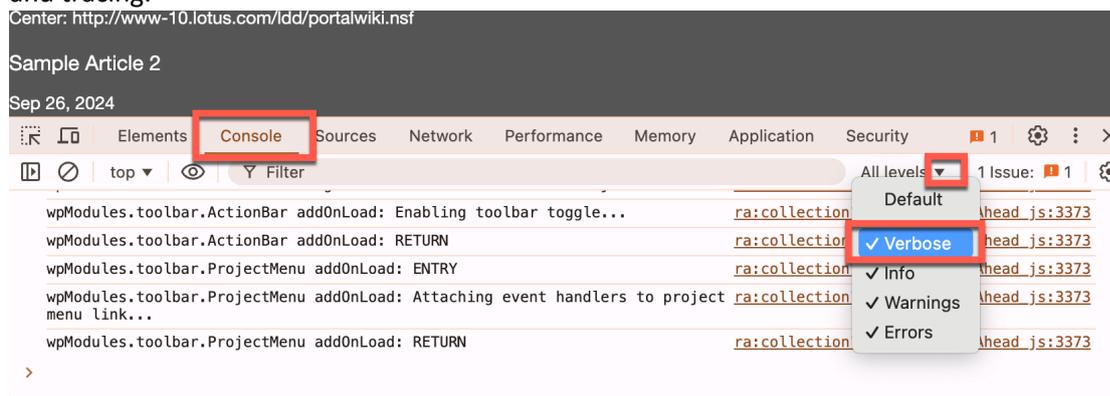


### Part 4: Use Theme Optimization Analyzer to Debug

Use the Theme Optimization Analyzer to analyze your theme and enable debugging



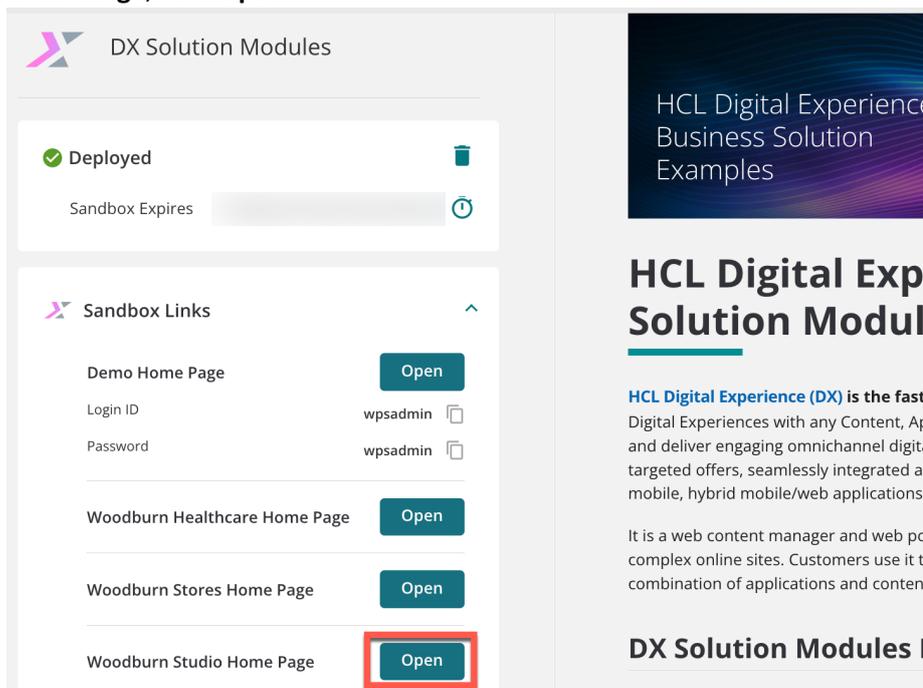
and tracing.



## Part 1: Add new Top Column 2 Column Equal Layout

As Gene, the DX developer, you want to allow your site managers to choose a Top Column 2 Column Equal page layout and create, add this to your theme and try it out.

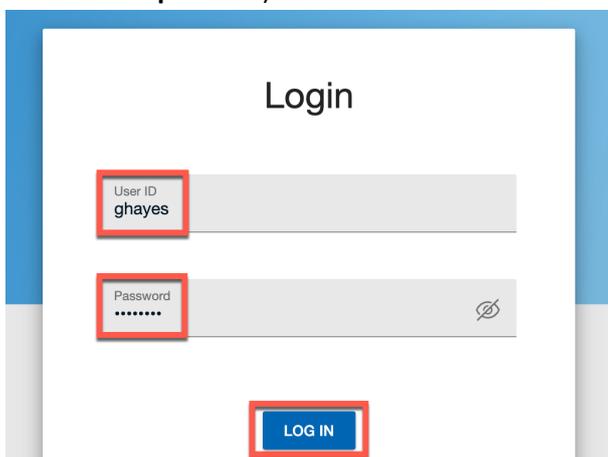
1. Start by checking the default layouts available on your existing HCL DX Theme. Go to your Promotion page of Woodburn Studio first where you have applied the HCL DX Theme theme. On the server where the DX Solution Modules has been installed, next to **Woodburn Studio Home Page**, click **Open**.



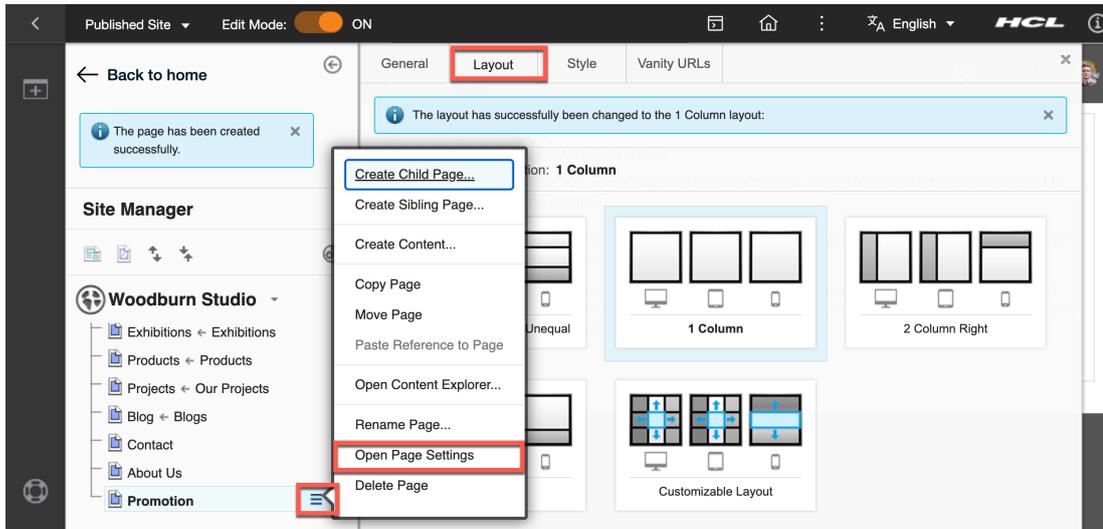
2. Log into your server as Gene Hayes. Click **Log in**.



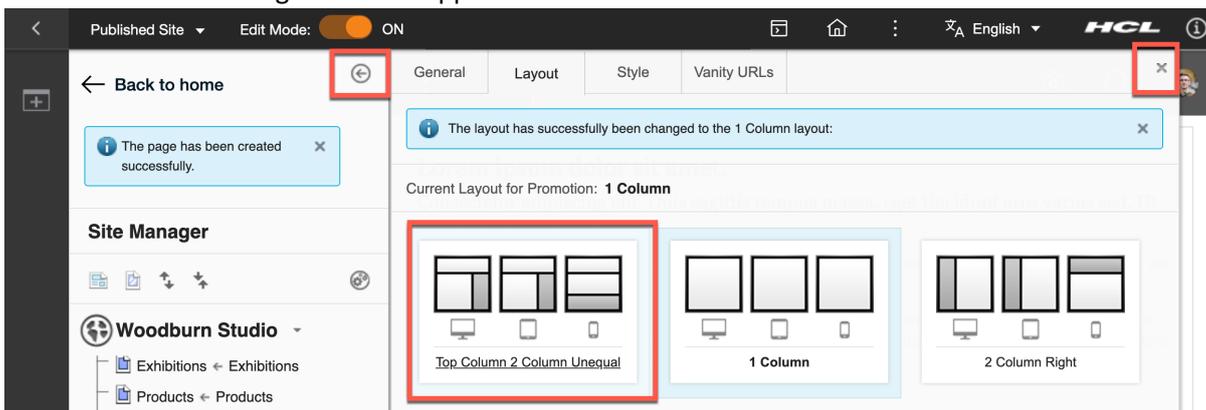
3. Then use the credentials of Gene (User ID: **ghayes**, Password: **HCL-Dem0** – if you do not have these, you may use the default administrator account with User ID: **wpsadmin**, Password: **wpsadmin**).



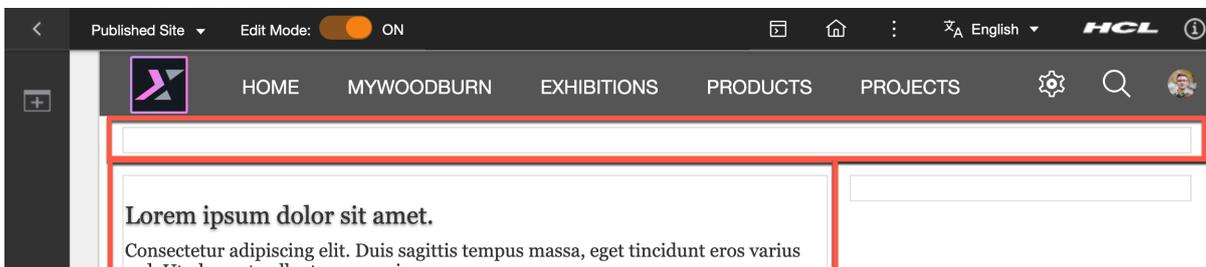
- Then go to your **Promotion** page, open its context menu, click **Open Page Settings** and **Layout**. If you do not have this promotion page, please redo parts 1 and 3 of the HDX-DEV-100 Theme Development lab.



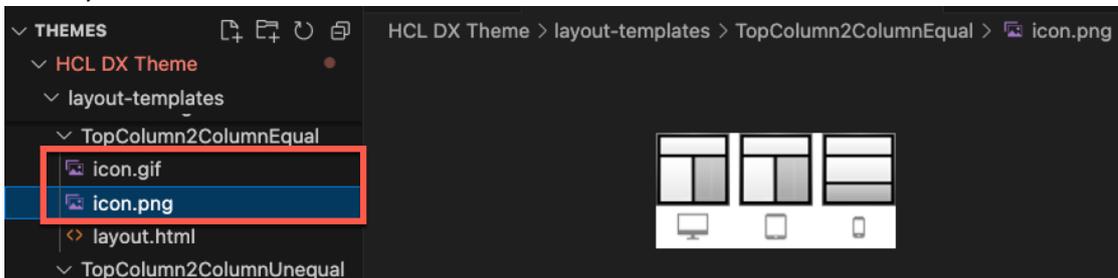
- And notice the different out of the box layouts of your theme. You will add a new layout Top Column 2 Column Equal that is like this with two equal columns in the second row. Now select this to see it working, by clicking the **Top Column 2 Column Unequal**. Then Close the Toolbar and Site Manager to see it applied.



- Here it shows for desktop. You may add page components and applications to make them more visible in view mode.



- Then go to your code editor and under your theme layout-templates add a new folder for your new layout. You may do this by copying the **TopColumn2ColumnUnequal** page layout. Select, copy and paste it in the same folder and rename it to **TopColumn2ColumnEqual**. Then replace the **icon.gif** and **icon.png** images by the ones you have downloaded to illustrate your new layout.



- Then update the **layout.html**. Instead of using 8 of 12 columns for the left wide container and 4 of 12 for the right narrow one, use 6 of 12 and medium for both. Keep the left as the main container and the right as secondary. Hence update the second row to this below and save it.

```

<div class="st-row">
  <div class="st-col st-col-c-6-of-12">
    <div class="component-container st-container ibmDndColumn wpthemeMedium" name="ibmMainContainer"></div>
  </div>
  <div class="st-col st-col-c-6-of-12">
    <div class="component-container st-container ibmDndColumn wpthemeMedium" name="secondary"></div>
  </div>
</div>

```

```

HCL DX Theme > layout-templates > TopColumn2ColumnEqual > layout.html > div.st-section > div.st-row > div.st-col.st-col-c-6-of-12 >
4 <div class="st-section">
9   <div class="st-row">
10    <div class="st-col st-col-whole">
11     <div class="component-container st-container stWholeCol ibmDndColumn wpthemeFull" name="headline"></div>
12    </div>
13   </div>
14   <div class="st-row">
15    <div class="st-col st-col-c-6-of-12">
16     <div class="component-container st-container ibmDndColumn wpthemeMedium" name="ibmMainContainer"></div>
17    </div>
18    <div class="st-col st-col-c-6-of-12">
19     <div class="component-container st-container ibmDndColumn wpthemeMedium" name="secondary"></div>
20    </div>
21   </div>
22 </div>
23

```

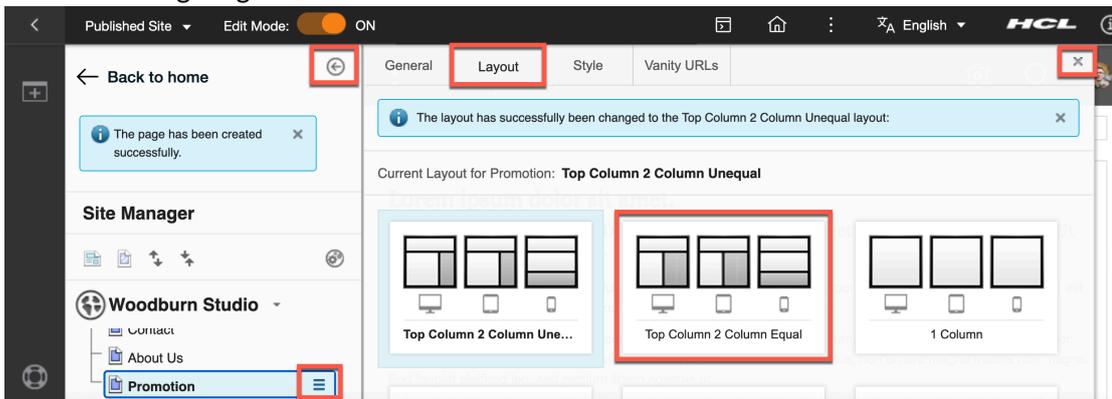
- Then you need to add this new layout to the existing **system/layouts.json**. Duplicate (copy and paste below) the first line for **TopColumn2ColumnUnequal**, modify it to match your new layout name (rename **Unequal** to **Equal** everywhere) and save it:

```

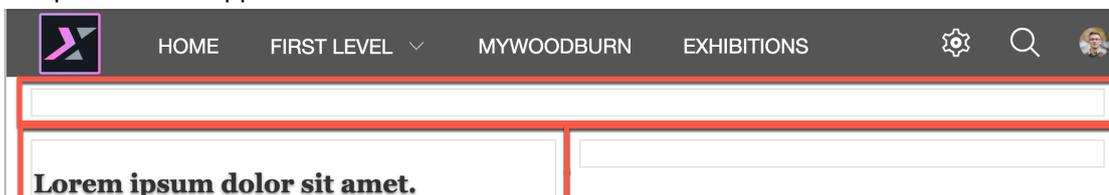
HCL DX Theme > system > {} layouts.json > ...
1  items: [
2   {url': ibmCfg.themeConfig.themeWebDAVBaseURI+'layout-templates/TopColumn2ColumnUnequal/', 'id': 'TopColumn2ColumnUnequal', 'thumbnail': ibmCfg.themeConfig.the
3   {url': ibmCfg.themeConfig.themeWebDAVBaseURI+'layout-templates/TopColumn2ColumnEqual/', 'id': 'TopColumn2ColumnEqual', 'thumbnail': ibmCfg.themeConfig.theRo
4   {url': ibmCfg.themeConfig.themeWebDAVBaseURI+'layout-templates/1Column/', 'id': '1Column', 'thumbnail': ibmCfg.themeConfig.themeRootURI+'layout-templates/1Co
5   {url': ibmCfg.themeConfig.themeWebDAVBaseURI+'layout-templates/2ColumnRight/', 'id': '2ColumnRight', 'thumbnail': ibmCfg.themeConfig.themeRootURI+'layout-tem
6   {url': ibmCfg.themeConfig.themeWebDAVBaseURI+'layout-templates/2ColumnLeft/', 'id': '2ColumnLeft', 'thumbnail': ibmCfg.themeConfig.themeRootURI+'layout-templ
7
8  ]
9

```

10. Then test it. Go back to your promotion page, open its context menu, click **Open Page Settings, Layout** and your new page layout **Top Column 2 Column Equal**. Close the toolbar and Site Manager again.



11. And you see the containers equally using the second row where you may add other page components and applications.

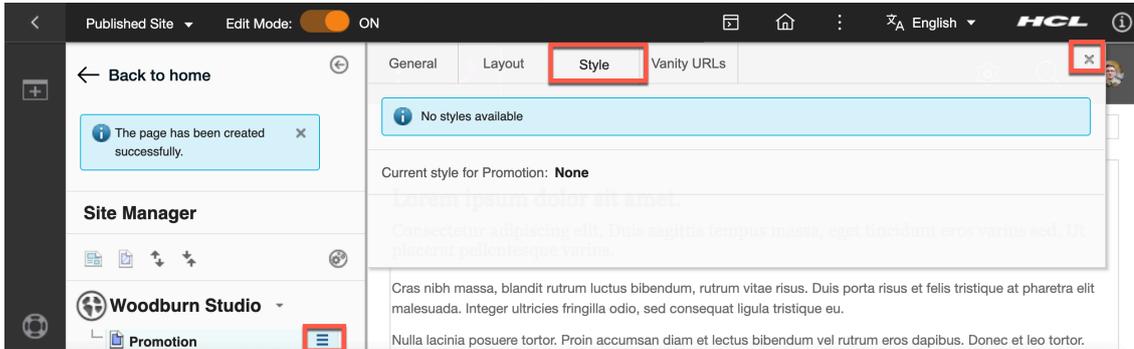


You have successfully added a new page layout and tested it on your page.

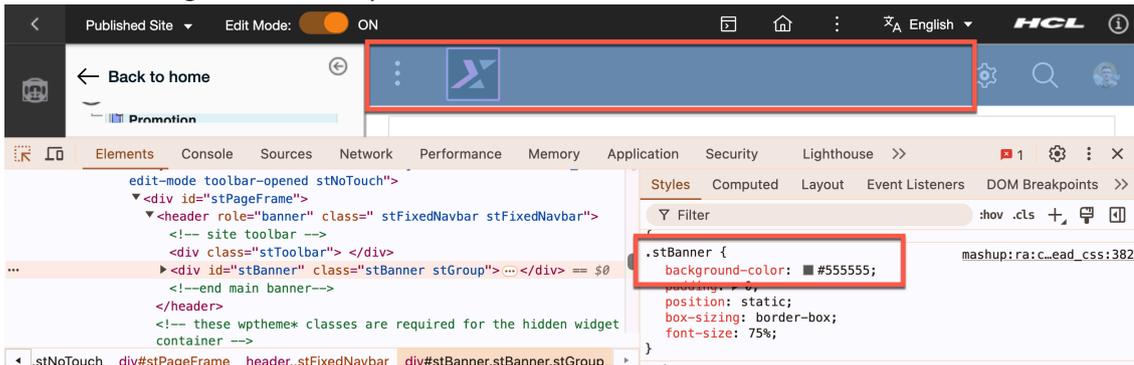
## Part 2: Add new Black and Red Styles

Then you add two extra styles, black and red, to manage the header banner background color and try it out.

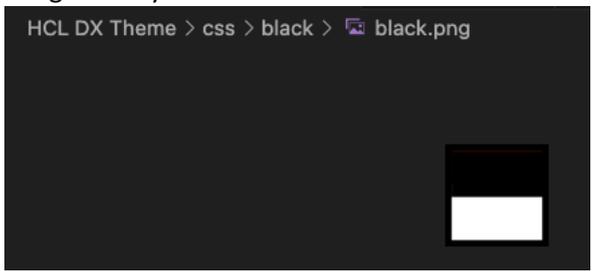
1. First check that currently there are no styles available. Go back to your promotion page, open the page **menu** and select **Open Page Settings** and select **Styles**. Then close the toolbar.



2. Then inspect the back ground color of your theme banner. Notice it is managed by the `stBanner` back-ground-color style.



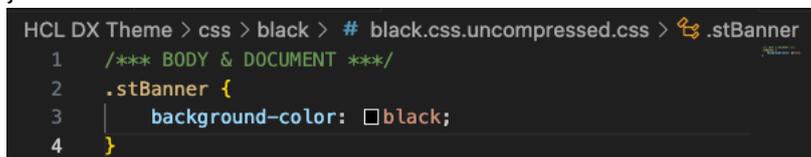
3. Now create new styles that allows to set this to black and red. Go back to your theme code editor and under the `css` directory, create a new folder and name it **black**. Copy the **black.png** image from your downloaded resources to it.



- Then create a new uncompressed css file for this style and name it **black.css.uncompressed.css**. Here you add all your style changes. In this, you will only change the background color of your header banner stbanner. Insert the following CSS styling.

```

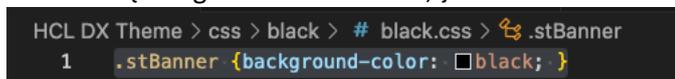
/** BODY & DOCUMENT */
.stBanner {
  background-color: black;
}
    
```



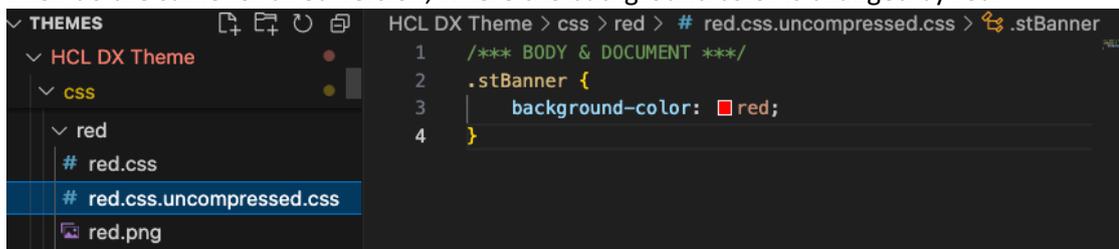
- You also need to add a compressed version of this. Create the corresponding new file **black.css** and put the corresponding compressed CSS styling.

```

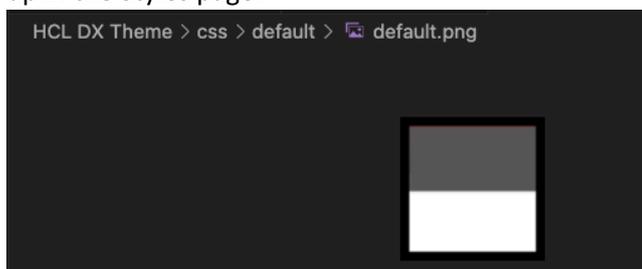
.stBanner {background-color: black; }
    
```



- Then do the same for a red version, where the background color is changed by red.



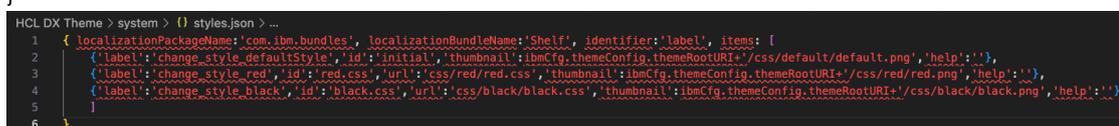
- You also need to add a **default.png** from your downloaded files to the default style to show up in the Styles page.



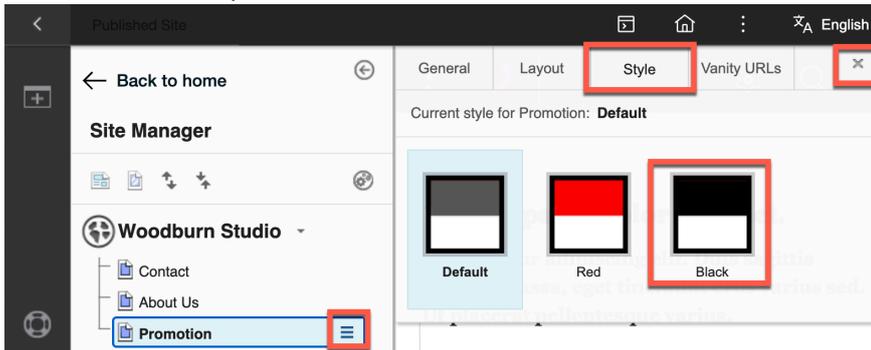
- And create a new **system/styles.json** file to make these appears under the styles page. Add the following (you may copy it from your downloaded resources as well).

```

{ localizationPackageName:'com.ibm.bundles', localizationBundleName:'Shelf', identifier:'label', items: [
  {'label':'change_style_defaultStyle','id':'initial','thumbnail':ibmCfg.themeConfig.themeRootURI+'/css/default/default.png','help':''},
  {'label':'change_style_red','id':'red.css','url':'css/red/red.css','thumbnail':ibmCfg.themeConfig.themeRootURI+'/css/red/red.png','help':''},
  {'label':'change_style_black','id':'black.css','url':'css/black/black.css','thumbnail':ibmCfg.themeConfig.themeRootURI+'/css/black/black.png','help':''}
]
}
    
```



9. Then try it out. Go back to your promotion page, open its context menu and select **Open Page Settings**, select **Styles**, notice the Default style is now selected, select **Black** and close the secondary toolbar.



10. It now shows black.



11. Now follow the same steps to change it to red.

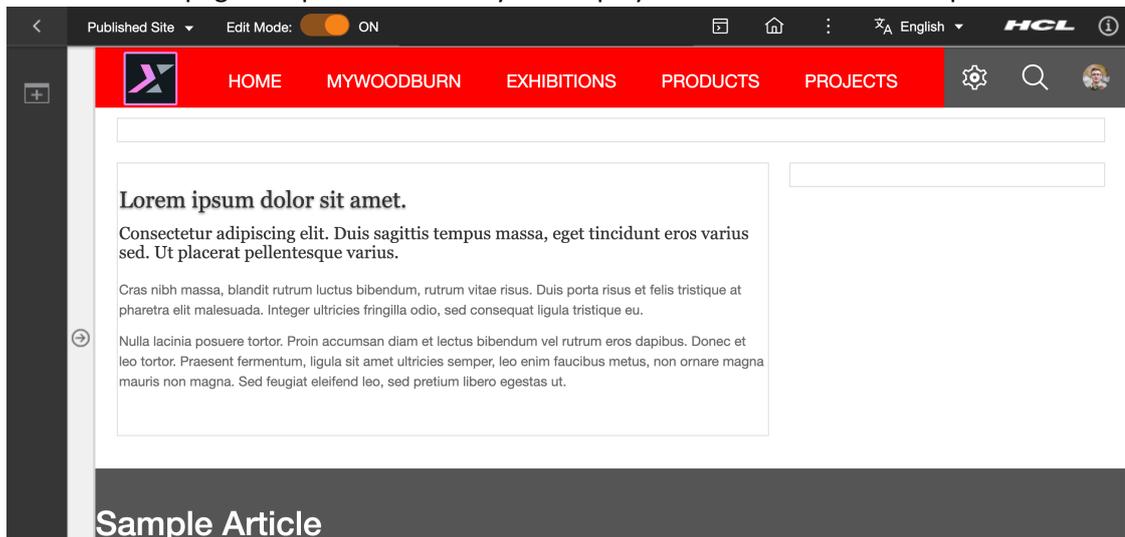


You have successfully added styles to your theme and test it on your Promotion page!

## Part 3: Discover Navigation Bar Module options and update Profile to Compressed one

Learn on how modules are used, by comparing two navigation bar modules and apply the compressed one to your theme profile that fixes the footer.

1. First check out what the fixed navigation bar does. Your promotion page shows the full content of the page components and may not display the footer if there is no space left.



2. This is managed by the `st_fixed_navbar` module, selected in the profile of your page. Go to your code editor and see how this module is created. Expand the folder **modules**, **st\_fixed\_navbar**, **config** and **head** and open the **readme.txt**. The JavaScript for this module is managed under the config folder with uncompressed and compressed JavaScript files and the styling under the head folder.

The screenshot shows a code editor interface. On the left, a file explorer shows the following structure:

- HCL DX THEME
  - modules
    - getting\_started\_module
    - st\_compressed\_navbar
    - st\_fixed\_navbar
      - config
        - fixed\_navbar.js
        - fixed\_navbar.js.uncompres...
        - fixed\_navbar.js.uncompres...
      - head
        - fixed\_navbar.css
        - fixed\_navbar.css.uncompres...
      - readme.txt
      - st\_layoutGrid
      - st\_navigation

The right pane shows the content of `readme.txt`:

```

1  st_fixed_navbar
2  =====
3  This module fixes the navbar to the top of the page and adjusts the top padding
4  of the main body content to ensure that the navbar does not cover any content
5  when at the top of the page. Javascript is used to determine how much padding
6  is needed.
7
8
9  How to use this module
10 =====
11 Simply add "st_fixed_navbar" to your profile's module list to enable this
12 module. Note that changing the class and id prefixes of your theme will require
13 to both config/fixed_navbar.js and head/fixed_navbar.css
  
```

- Now have a look at the `st_compressed_navbar` module. Expand again the folders `st_compressed_navbar`, `config` and `head` and open the `readme.txt`.

The screenshot shows the VS Code interface. On the left, the Explorer pane shows the file structure under 'HCL DX THEME' > 'modules' > 'st\_compressed\_navbar'. The folders 'st\_compressed\_navbar', 'config', and 'head' are expanded, and the file 'readme.txt' is selected. On the right, the editor shows the content of 'readme.txt':

```

1 st_compressed_navbar
2 =====
3 This module shrinks the navbar when the user scroll down a page and restores it
4 to it's normal height when scrolling up or when they hover their mouse over the
5 navbar.
6
7 How to use this module
8 -----
9 Simply add "st_compressed_navbar" to your profile's module list to enable this
10 module. Note that changing the class and id prefixes of your theme will
11 require updates to both config/compressed_navbar.js and
12 head/compressed_navbar.css
    
```

- You may further investigate the code themselves to see how this is implemented. Now, you want to use the compressed navbar instead of your fixed one. This is managed in the profile. Your current page uses the bootstrap profile. Edit this. Expand the `profiles` folder and open the `profile_bootstrap.json` file. You see the selection of the `st_fixed_navbar` module.

The screenshot shows the VS Code Explorer pane with 'profiles' expanded and 'profile\_bootstrap.json' selected. The editor shows the JSON content of the file:

```

12 "moduleIDs": [
13   "wp_layout_windowstates",
14   "wp_portal",
15   "wp_oob_sample_styles",
16   "wp_draft_page_ribbon",
17   "st_fixed_navbar",
18   "st_navigation",
19   "st_notice"
    
```

The 'profile\_bootstrap.json' file in the Explorer and the '"st\_fixed\_navbar"' entry in the JSON array are highlighted with red boxes.

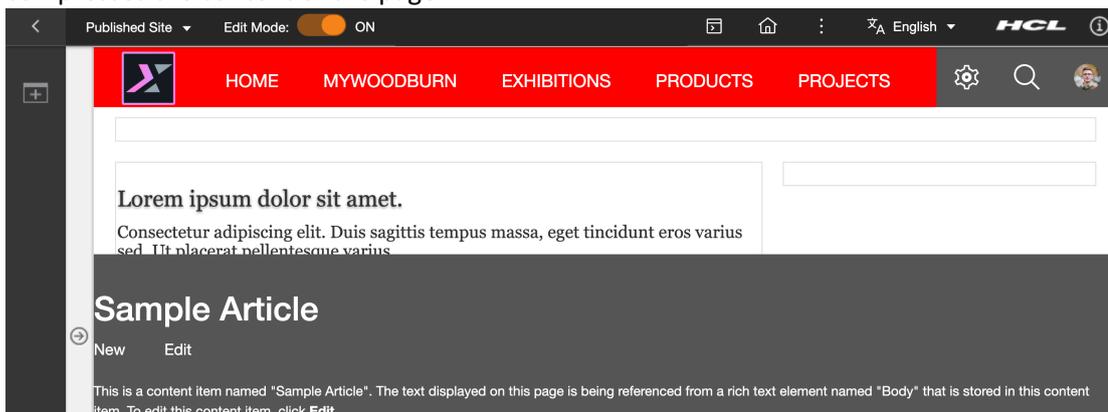
- Change that to `st_compressed_navbar` and save it.

This is a close-up of the JSON array in 'profile\_bootstrap.json' after the change. The entry '"st\_compressed\_navbar"' is now highlighted with a red box.

```

12 "moduleIDs": [
13   "wp_layout_windowstates",
14   "wp_portal",
15   "wp_oob_sample_styles",
16   "wp_draft_page_ribbon",
17   "st_compressed_navbar",
18   "st_navigation",
    
```

- 6. Then refresh the Promotion page and you now see that the footer fully shows and compresses the content of the page.

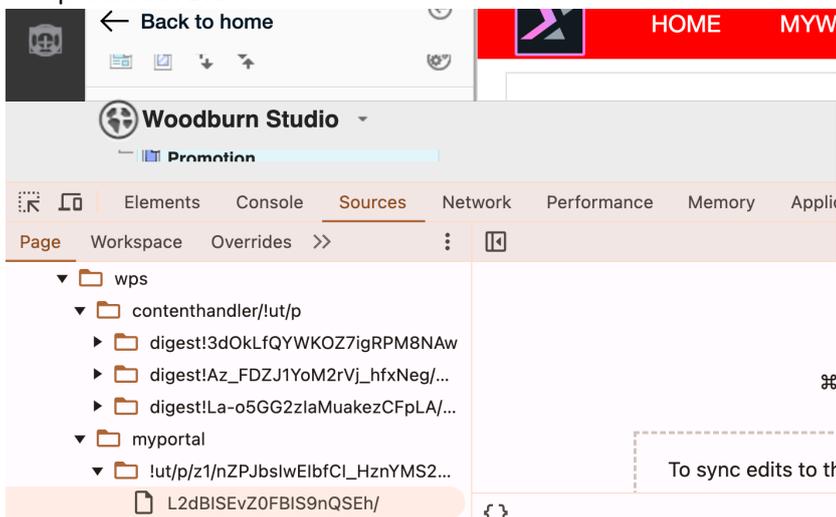


You have successfully discovered how modules are developed and configured in profiles.

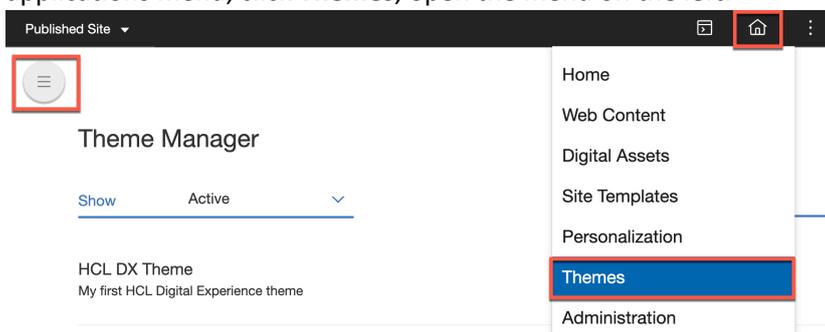
## Part 4: Use Theme Optimization Analyzer to Debug

Use the Theme Optimization Analyzer to analyze your theme, enable debugging and tracing.

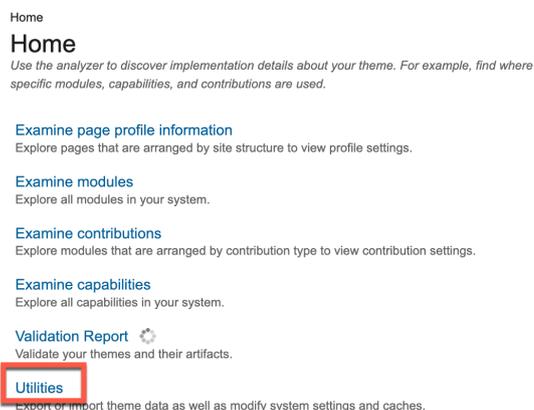
1. First check what information you may see without the debugging enabled. Inspect your page and check the Sources. Notice there is not much CSS or JavaScript that shows, as it is all compressed in DX.



2. Then go back to the control center under the Theme Optimization Analyzer. Open the applications menu, click **Themes**, open the menu on the left.



3. Then click **Analyzer** and notice the different options to analyze your page profile information, modules, contributions, capabilities and use a validation report. Then go to the utilities. Click **Utilities**.



4. And click **Control Center**.

[Home](#) > Utilities

## Utilities

### Export Theme Data

If you need help with a theme issue, you can export your data to share with IBM support or your local support organization. Support personnel are able to import and view your data to troubleshoot problems.

Export display data as a compressed file. [Click here to export data.](#)

### Import Theme Data

Import theme data to analyze and troubleshoot issues from another server. Only files that are exported from the Theme Analyzer can be imported.

Filename:  No file chosen

### Control Center

Various system settings and modifications of the theme optimization framework.

### Client Tracing

Enable and disable tracing for client side javascript.

### Advanced Utilities

More system utilities around theme optimization

5. Where you enable the remote debugging for the server, all users and individual request. Click **Click to turn on**.

#### Remote Debugging

This option controls whether the system returns debug resources as defined by module contributions, which are usually uncompressed versions of javascript or css. This feature can be enabled for the complete server or an individual client. If the feature is enabled for the complete server, the debug resources are active for all users of this server and it stops the combiner from downloading multiple files in one request. Instead, each downloaded file is fetched in its own separate request.

Remote Debug (Server, all users, individual requests) is turned **off**. [Click to turn on.](#)

Remote Debug (Current browser only, combined) is turned **off**. [Click to turn on.](#)

6. It should show it is turned **on**.

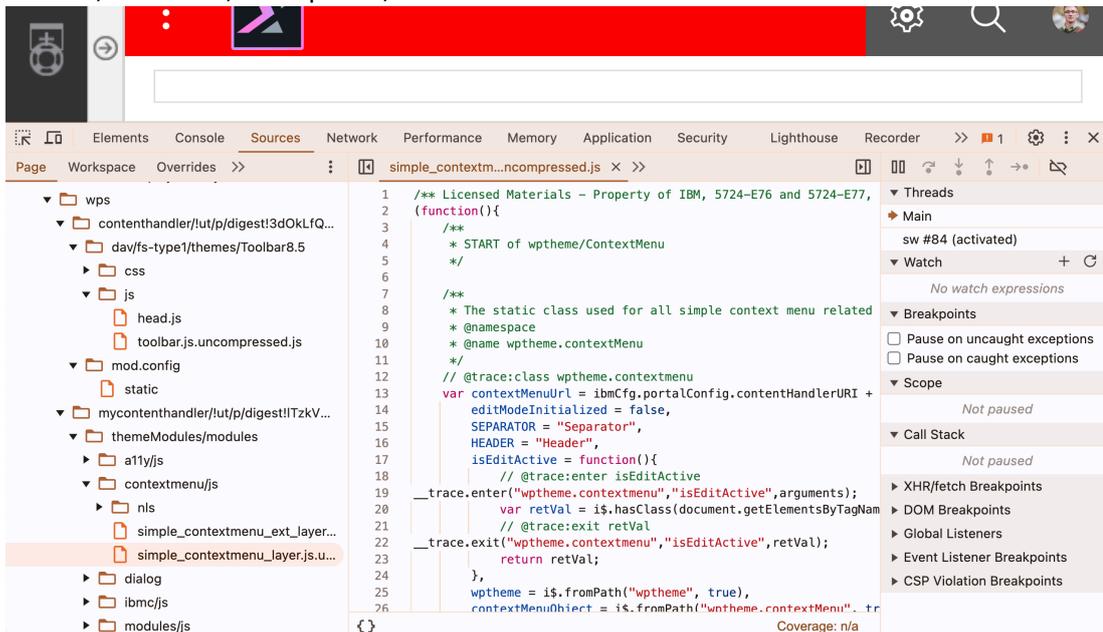
#### Remote Debugging

This option controls whether the system returns debug resources as defined by module contributions, which are usually uncompressed versions of javascript or css. This feature can be enabled for the complete server or an individual client. If the feature is enabled for the complete server, the debug resources are active for all users of this server and it stops the combiner from downloading multiple files in one request. Instead, each downloaded file is fetched in its own separate request.

Remote Debug (Server, all users, individual requests) is turned **on**. [Click to turn off.](#)

Remote Debug (Current browser only, combined) is turned **off**. [Click to turn on.](#)

- Now refresh the page and notice you have access to much more resources, including the uncompressed CSS and JavaScript files. You may use the debugging tools on them, see the threads, set watch, breakpoints, etc.



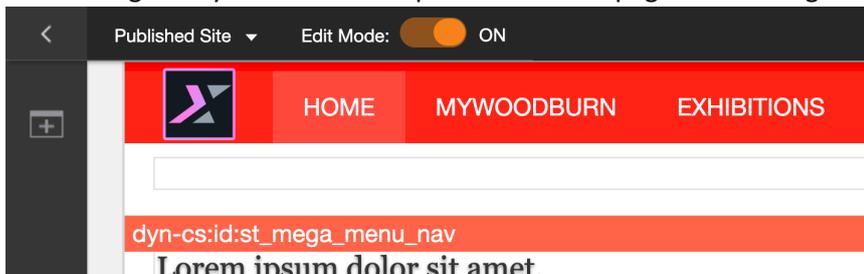
- Then enable the dynamic content spot debugging. Turn on the **Default** debug. Click **Click to turn on**.

**Dynamic Content Spot Debugging**  
 This option controls a visualization feature for dynamic content spots. It allows to pinpoint exactly which markup was contributed by which dynamic content spot. Please note that this setting is not persisted across a server restart.  
 Dynamic Content Spot (Default) Debug is turned off. [Click to turn on.](#)  
 Dynamic Content Spot (Inline) Debug is turned off. [Click to turn on.](#)

- Refresh the Promotion page and when you hover your mouse over parts of your page, you'll notice what resources have been used. E.g. when hovering over the Project Menu that shows Published Site, you see it is managed by the projectmenu.jsp resource:



- Or showing the dynamic content spot used for the page menu navigation.



- 11. To more easily see all the different resources used, turn on the **Inline** debug. Click **Click to turn on**.

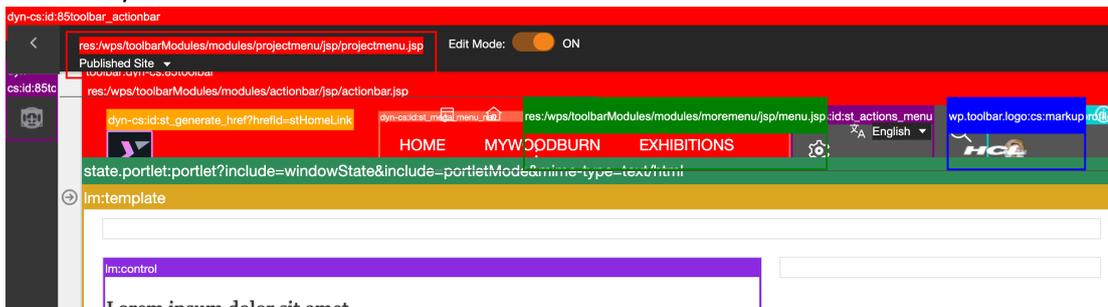
**Dynamic Content Spot Debugging**

This option controls a visualization feature for dynamic content spots. It allows to pinpoint exactly which markup was contributed by which dynamic content spot. Please note that this setting is not persisted across a server restart.

Dynamic Content Spot (Default) Debug is turned **on**. [Click to turn off](#).

Dynamic Content Spot (Inline) Debug is turned **off**. [Click to turn on](#).

- 12. And now you see all the different resources used.



13. You may want to disable the dynamic content spot debugging first. Then check that, while you may use examine options and validation report, you may also write all information on profiles, modules and meta modules to the trace.log. Finally, have a look at how client tracing works. Click **Utilities**.

Home > **Utilities** > Control Center

## Control Center

**Invalidate Cache**  
This option allows to invalidate all theme optimization related caches such as profiles and modules. With this you can make changes to profiles or modules and after invalidating the caches the system will pick up the changes. [Click to invalidate.](#)

**Remote Debugging**  
This option controls whether the system returns debug resources as defined by module contributions, which are usually uncompressed versions of javascript or css. This feature can be enabled for the complete server or an individual client. If the feature is enabled for the complete server, the debug resources are active for all users of this server and it stops the combiner from downloading multiple files in one request. Instead, each downloaded file is fetched in its own separate request.  
Remote Debug (Server, all users, individual requests) is turned **off**. [Click to turn on.](#)  
Remote Debug (Current browser only, combined) is turned **on**. [Click to turn off.](#)

**Dynamic Content Spot Debugging**  
This option controls a visualization feature for dynamic content spots. It allows to pinpoint exactly which markup was contributed by which dynamic content spot. Please note that this setting is not persisted across a server restart.  
Dynamic Content Spot (Default) Debug is turned **off**. [Click to turn on.](#)  
Dynamic Content Spot (Inline) Debug is turned **off**. [Click to turn on.](#)

**Development Mode**  
This option controls the development mode feature which disables all caches of the theme optimization framework.  
Development mode is turned **on**. [Click to turn off.](#)

**Reports**  
This option provides various reports about the theme optimization framework that are written into the trace file. Please note that these settings are not persisted across a server restart.  
The profile report writes information about the recognized profiles as you access your theme.  
Profile reporting is turned **off**. [Click to turn on.](#)  
The module report writes information about all recognized modules in the system.  
Module reporting is turned **off**. [Click to turn on.](#)  
The meta module report writes only information about the recognized meta modules in the system.  
Meta module reporting is turned **off**. [Click to turn on.](#)

14. Then Client Tracing.

Home > Utilities

## Utilities

**Export Theme Data**  
If you need help with a theme issue, you can export your data to share with IBM support or your local support organization. Support personnel are able to import and view your data to troubleshoot problems.  
Export display data as a compressed file. [Click here to export data.](#)

**Import Theme Data**  
Import theme data to analyze and troubleshoot issues from another server. Only files that are exported from the Theme Analyzer can be imported.  
Filename:  No file chosen

**Control Center**  
Various system settings and modifications of the theme optimization framework.

**Client Tracing**  
Enable and disable tracing for client side javascript.

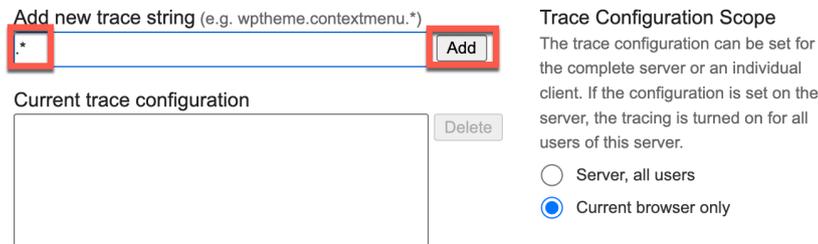
**Advanced Utilities**  
More system utilities around theme optimization

- Here you may indicate what traces to show. Use new trace string `.*` to first show traces for all JavaScript, select **Current browser only** (or server if you want everyone to benefit from this) and click **Add**.

[Home](#) > [Utilities](#) > Client Tracing

### Client Tracing

Allows to enable and disable client side javascript specific tracing. Multiple trace strings can be added to the overall trace configuration. The trace settings will be active immediately. Please note that turning on tracing will also enable uncompressed resources (of type debug) to be downloaded instead.



- Ensure it shows under the current trace configuration, as shown.

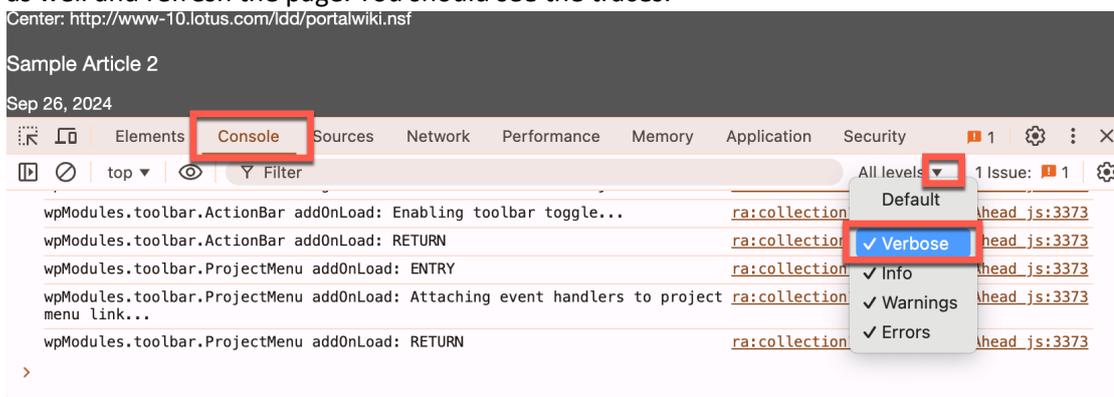
[Home](#) > [Utilities](#) > Client Tracing

### Client Tracing

Allows to enable and disable client side javascript specific tracing. Multiple trace strings can be added to the overall trace configuration. The trace settings will be active immediately. Please note that turning on tracing will also enable uncompressed resources (of type debug) to be downloaded instead.



- Then inspect your page again. Go to the Console tab, ensure you selected the Verbose level as well and refresh the page. You should see the traces.



18. Then update the current trace configuration to only show those related to the wpModule Toolbar. Remove the current entry `.*` by selecting it and clicking **Delete** and add **`wpModules.toolbar.*`**.

Add new trace string (e.g. `wptheme.contextmenu.*`)

Current trace configuration

**Trace Configuration Scope**

The trace configuration can be set for the complete server or an individual client. If the configuration is set on the server, the tracing is turned on for all users of this server.

Server, all users

Current browser only

You have successfully learned how to use the Theme Optimization Analyzer to debug your theme code.

## Conclusion

Using this lab tutorial, you created a new theme on the DX server, based on a Bootstrap based Simple theme template. You have created a new Promotion test page that you configured to run with your new theme and that allows you to easily see any updates. Then you used the Theme Editor to look at several aspects of them, like the CSS and layout templates, and make an update to the footer to use a Web Content item. And then you learned how to pull the theme code to your local system, make further changes with your preferred code editor and push them to the DX server using WebDav and DXClient and optionally using the HCL DX Extensions for Visual Studio Code, Web Developer Toolkit with its Web Developer Dashboard and dxsync command.

### Resources

Refer to the following resources to learn more:

HCL Digital Experience Home - <https://hclsw.co/dx>

HCL Digital Experience on HCL Solutions Factory (SoFy) - <https://hclsofy.com/>

HCL Software - <https://hclsw.co/software>

HCL Product Support - <https://hclsw.co/product-support>

HCL DX Product Documentation - <https://hclsw.co/dx-product-documentation>

HCL DX Support Q&A Forum - <https://hclsw.co/dx-support-forum>

HCL DX Video Playlist on YouTube - <https://hclsw.co/dx-video-playlist>

HCL DX Product Ideas - <https://hclsw.co/dx-ideas>

HCL DX Product Demos - <https://hclsw.co/dx-product-demo>

HCL DX Did You Know? Videos - <https://hclsw.co/dx-dyk-videos>

HCL DX GitHub - <https://hclsw.co/dx-github>

HCL DX Extensions for Visual Studio Code - <https://hclsw.co/dx-extension-vsc>

HCL DX Web Developer Toolkit - <https://github.com/HCL-TECH-SOFTWARE/WebDevToolkitForDx>

HCL DX File Sync (dxsync) - <https://github.com/HCL-TECH-SOFTWARE/dxsync>

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