

Drupal 8 Cache API

...and tacos! 🌮



Märt Matsoo

Developer

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Major: Back-End

Minor: Front-End

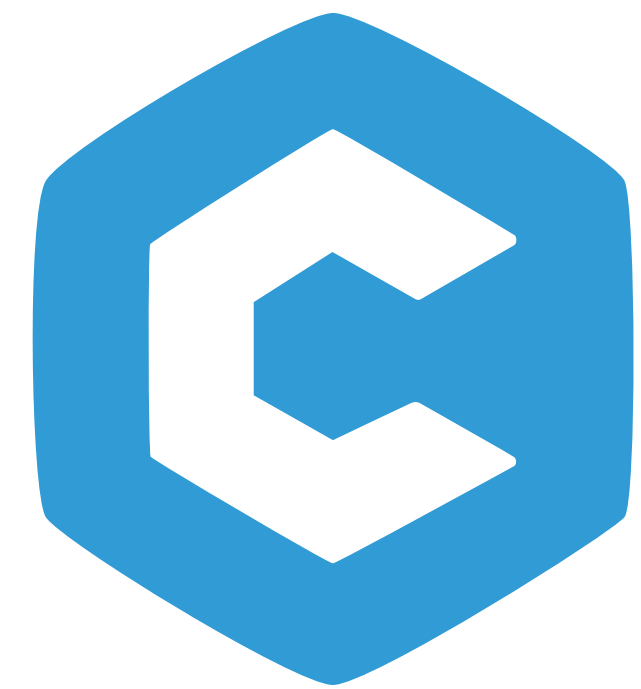
Who?

Originally from Toronto, Canada

Lives in Tallinn, Estonia

Drupal since 2008

Works for Chromatic!



CHROMATIC

<https://chromatichq.com>

@ChromaticHQ

What is Chromatic?

Mostly Drupal-focused with Front End and DevOps expertise

Been around for over 10 years

Distributed (No head office. No office, period.)

<https://chromatichq.com>

Taco time...

Drupal 8 Cache API

...and tacos! 🌮

Why cache at all?

- Buy a Big Mac or buy the ingredients and make one at home?
- Minutes vs Hours
- Cached page vs Non-cached page
- Milliseconds vs Seconds
- 281 milliseconds vs 2.97 seconds on my local



Drupal render arrays

- Render arrays are the building blocks of a Drupal page
- Introduced in Drupal 7 and allow for flexibility in extending / altering / overriding parts of the page

```
<div class="content">?php print $content_attributes; ?><?php  
  print render($content);  
?></div>
```

- `print render($content);`

- It's important that our render array - the thing that renders the HTML - knows to cache itself
- **From D.O.:** "It is of the utmost importance that you inform the Render API of the cacheability of a render array." - From Cacheability of Render Arrays*

* <https://www.drupal.org/docs/8/api/render-api/cacheability-of-render-arrays>

Originally a blog post

A screenshot of a blog post header from Chromatic. The background is a close-up image of several tacos in a wooden bowl, featuring lettuce, tomatoes, and cheese. The text is overlaid on this image. In the top left corner, there is a blue hexagonal logo with a white 'C' and the word 'CHROMATIC' in white. In the top right corner, there is a blue button with the word 'Menu' in white. The main title is centered in white text. At the bottom, there is a white bar containing a profile picture of a man, the name 'Märt Matsoo', and the date 'February 20, 2017'.

 CHROMATIC

Menu

A Taco-Friendly Guide to
Cache Metadata in Drupal 8

 Märt Matsoo / February 20, 2017

Got Slack? Get HeyTaco!

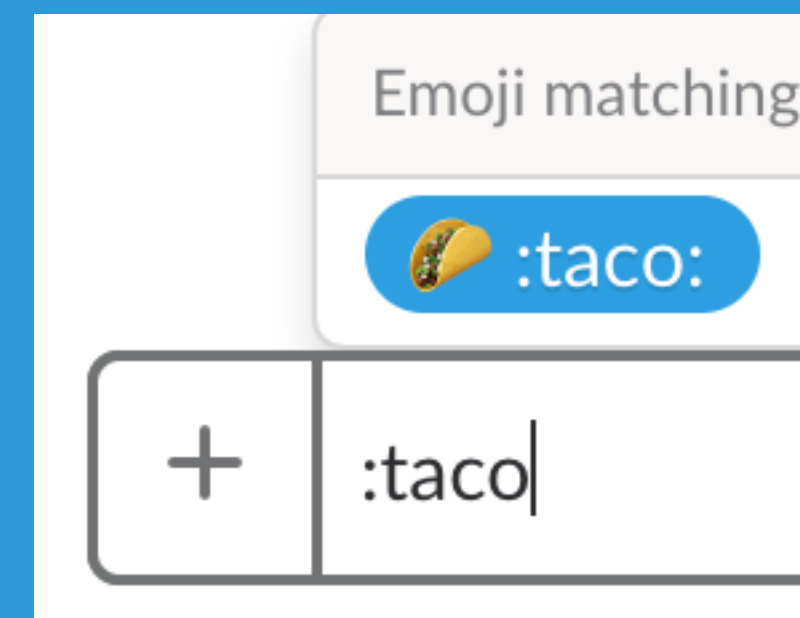
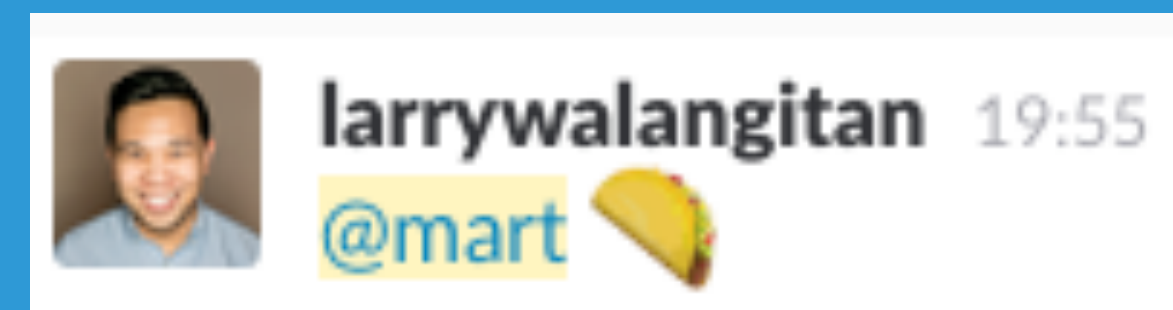


slack

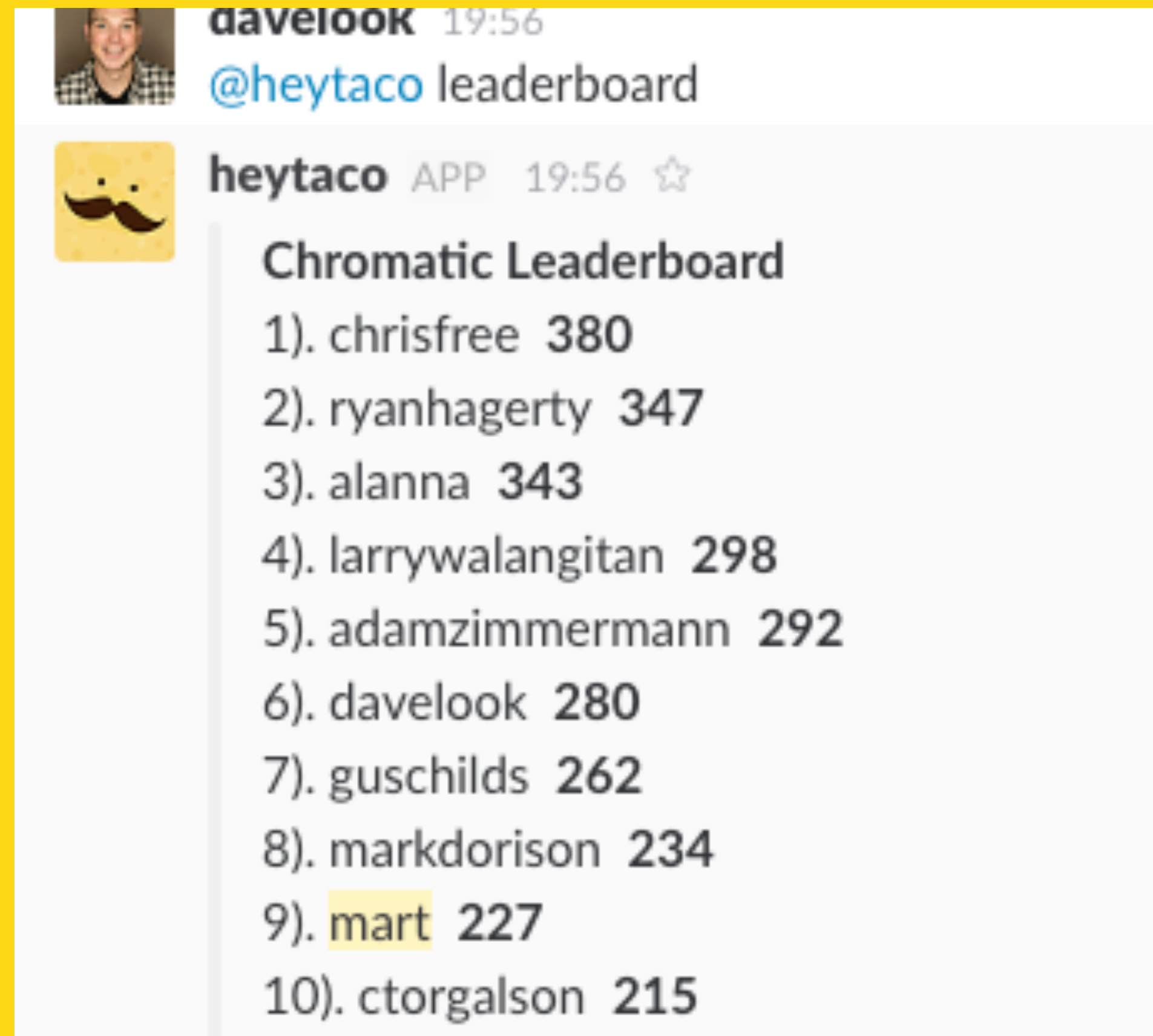


HeyTaco!

- HeyTaco! is an integration app for Slack
- You hand out tacos to show appreciation and HeyTaco! keeps track of who gets them and how many they have.
- 5 tacos to hand out each day.



HeyTaco! in Slack looks like this



A screenshot of a Slack message. The message is from a user named 'davelook' at 19:56, mentioning '@heytao' and 'leaderboard'. The message content shows a 'Chromatic Leaderboard' with a list of 10 users and their scores. The user 'mart' is highlighted in yellow in the original image.

davelook 19:56
@heytao leaderboard

heytao APP 19:56 ☆

Chromatic Leaderboard

- 1). chrisfree 380
- 2). ryanhagerty 347
- 3). alanna 343
- 4). larrywalangitan 298
- 5). adamzimmermann 292
- 6). davelook 280
- 7). guschilds 262
- 8). markdorison 234
- 9). **mart** 227
- 10). ctorgalson 215

HeyTaco! API



API

```
// Using Guzzle.  
$response = \Drupal::httpClient()->get(HEYTACO_URL);  
// Get JSON from HeyTaco.  
$json_string = (string) $response->getBody();  
$leaderboard = array_shift(json_decode($json_string, TRUE));
```

There is one main object in our API: Leaderboard. We currently only offer a JSON response format. If you have any questions please [contact us](#).

Leaderboard

Retrieve your team leaderboard ([Sign in to HeyTaco!](#) to display your team id below):

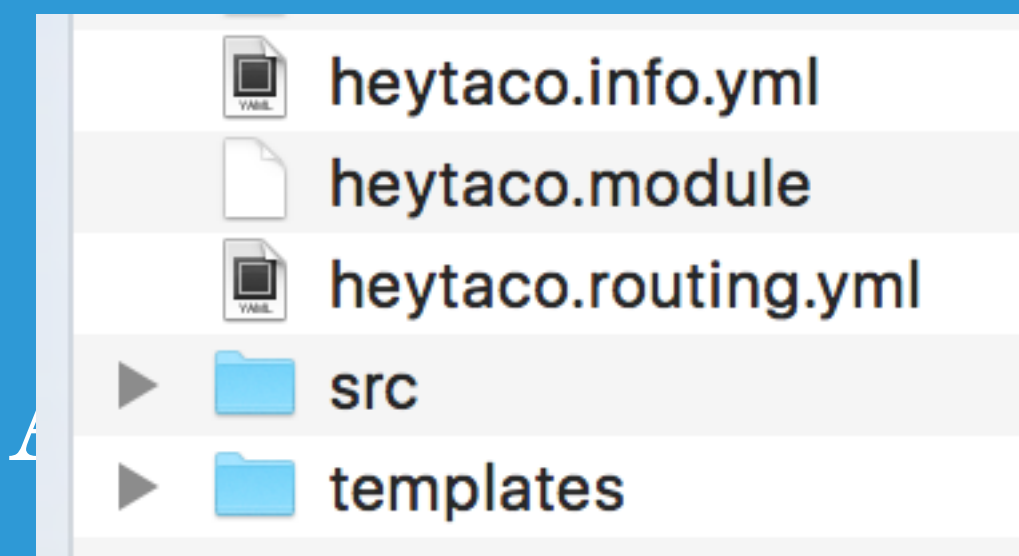
```
https://www.heytao.chat/api/v1/json/leaderboard/{%teamId%}?days=1
```

Example JSON Response

```
{  
  "leaderboard": [{  
    "received_by_id": "U123456789",  
    "username": "test",  
    "team_name": "Test",  
    "avatar": "https://secure.gravatar.com/avatar/9828a53f505ab5ea9c7daedee91.png",  
    "timestamp": "2016-11-12T10:30:32.000Z",  
    "count": "1"  
  }]  
}
```

What's the plan?

- drush core-quick-drupal (“qd”, “cutie”)
- Drupal 8 custom module creates a Block
- Custom code grabs leaderboard from HeyTaco! <https://www.hey-taco.com/ChromaticHQ/hey-taco>)
- Use D8 Cache settings to cache it separately for each user
- Add bonus tacos to the bosses' totals to make them think they're great
- A bit of Twig to theme it (hey-taco-block.html.twig)



Partner vs Non-partner Leaderboards

HeyTaco! Leaderboard

Hi chrisfree!

1. chrisfree **486**
2. davelook **386**
3. alanna **363**
4. ryanhagerty **357**
5. markdorison **341**
6. larrywalangitan **306**
7. adam **297**
8. guschilds **270**
9. märt **234**
10. ctorgalson **229**

HeyTaco! Leaderboard

Hi alanna!

1. chrisfree **486** *
2. davelook **386** *
3. alanna **363**
4. ryanhagerty **357**
5. markdorison **341** *
6. larrywalangitan **306**
7. adam **297**
8. guschilds **270**
9. märt **234**
10. ctorgalson **229**

* Partners' results padded by 100 tacos

```

/**
 * Provides a Hey Taco Results block
 *
 * @Block(
 *   id = "heytao_block",
 *   admin_label = @Translation("HeyTaco! Leaderboard"),
 * )
 */

class HeyTacoBlock extends BlockBase implements ContainerFactoryPluginInterface {

    /**
     * construct() and create() functions here
     */

    /**
     * {@inheritdoc}
     */

    public function build() {
        $user_id = $this->account->id();
        return array(
            '#theme' => 'heytao_block',
            '#results' => $this->returnLeaderboard($user_id),
            '#partner_asterisk_blurb' => $this->isNotPartner($user_id),
            '#cache' => [
                'keys' => ['heytao_block'],
                'contexts' => ['user'],
                'tags' => ['user_list'],
                'max-age' => 3600,
            ],
        );
    }
}

```

HeyTaco Leaderboard block

Sidebar first Place block

↕ Search	Forms	Sidebar first
↕ Hey Taco Leaderboard		Sidebar first
↕ Tools	Menus	Sidebar first

#cache property's metadata

- keys
- contexts
- tags
- max-age


```
/**
 * {@inheritdoc}
 */
public function build() {
    // Dependency injection used create() and __construct() pattern.
    $user_id = $this->account->id();
    return array(
        '#theme' => 'heytao_block',
        '#results' => $this->returnLeaderboard($user_id),
        '#partner_asterisk_blurb' => $this->isNotPartnerBlurb($user_id),
        '#display_name' => $this->account->getUsername(),
        '#cache' => [
            'keys' => ['heytao_block'],
            'contexts' => ['user'],
            'tags' => ['user_list'],
            'max-age' => 3600,
        ],
    );
}
```

```
/**
 * {@inheritdoc}
 */
public function build() {
    // Dependency injection used create() and __construct() pattern.
    $user_id = $this->account->id();
    return array(
        '#theme' => 'heytao_block',
        '#results' => $this->returnLeaderboard($user_id),
        '#partner_asterisk_blurb' => $this->isNotPartnerBlurb($user_id),
        '#display_name' => $this->account->getUsername(),
        '#cache' => [
            'keys' => ['heytao_block'],
            'contexts' => ['user'],
            'tags' => ['user_list'],
            'max-age' => 3600,
        ],
    );
}
```

```
/**
 * {@inheritdoc}
 */
public function build() {
    // Dependency injection used create() and __construct() pattern.
    $user_id = $this->account->id();
    return array(
        '#theme' => 'heytao_block',
        '#results' => $this->returnLeaderboard($user_id),
        '#partner_asterisk_blurb' => $this->isNotPartnerBlurb($user_id),
        '#display_name' => $this->account->getUsername(),
        '#cache' => [
            'keys' => ['heytao_block'],
            'contexts' => ['user'],
            'tags' => ['user_list'],
            'max-age' => 3600,
        ],
    );
}
```

keys

```
'#cache' => [  
  'keys' => ['heytao_block'],  
  'contexts' => ['user'],  
  'tags' => ['user_list'],  
  'max-age' => 3600,  
],
```

- **From Drupal.org:** ...what identifies the thing I'm rendering?
- This is the "what", as in "What entity is being rendered?"
- Can be more than a single string
- Cache keys must only be set if the render array should be cached

```
'#cache' => [  
  'keys' => ['view', $view_id, 'display', $display_id],  
],
```

contexts

```
'#cache' => [  
  'keys' => ['heytao_block'],  
  'contexts' => ['user'],  
  'tags' => ['user_list'],  
  'max-age' => 3600,  
],
```

- **From Drupal.org:** Does the representation of the thing I'm rendering vary per ... something?
- This is the "which", as in, "Which version of the block should be shown?"
- Contexts aren't just user-based; they can also be based on
 - cookies**
 - ip**
 - theme**
 - timezone**
 - url**and more...modules can also define their own (<https://www.drupal.org/docs/8/api/cache-api/cache-contexts>)
- There is a list of cache contexts in `core.services.yml`

tags

```
'#cache' => [  
  'keys' => ['heytao_block'],  
  'contexts' => ['user'],  
  'tags' => ['user_list'],  
  'max-age' => 3600,  
],
```

- **From Drupal.org:** What data does it depend upon, so that when that data changes, so should the representation?
- String, cannot contain spaces, generally in the form <entity type>:<entity ID>
- Can be in sets: ['user:3', 'user:4', 'user:5']

HeyTaco! Leaderboard

Hi märt!

1. chrisfree **486** *
2. davelook **386** *
3. alanna **363**
4. ryanhagerty **357**
5. markdorison **341** *
6. larrywalangitan **306**
7. adam **297**
8. guschids **270**
9. märt **234**
10. ctorgalson **229**

* Partners' results padded by 100 tacos

HeyTaco! Leaderboard

Hi Märt Matsoo!

1. chrisfree **486** *
2. davelook **386** *
3. alanna **363**
4. ryanhagerty **357**
5. markdorison **341** *
6. larrywalangitan **306**
7. adam **297**
8. guschids **270**
9. Märt Matsoo **234**
10. ctorgalson **229**

* Partners' results padded by 100 tacos

max-age

```
'#cache' => [  
  'keys' => ['heytao_block'],  
  'contexts' => ['user'],  
  'tags' => ['user_list'],  
  'max-age' => 3600,  
],
```

- Max amount of time to cache this rendering
- Measured in seconds (3600 = 1 hour)
- Defaults to forever (Cache::PERMANENT)

Helpful Info from D.O.

From D.O.*: Cache **contexts**, **tags** and **max-age** *must always be set*, because they affect the cacheability of the entire response. Therefore they "bubble": parents *[ie. the page that contains our Hey Taco block]* automatically receive them.

and...

Cache **keys** must only be set if the render array should be cached.

* <https://www.drupal.org/docs/8/api/render-api/cacheability-of-render-arrays>

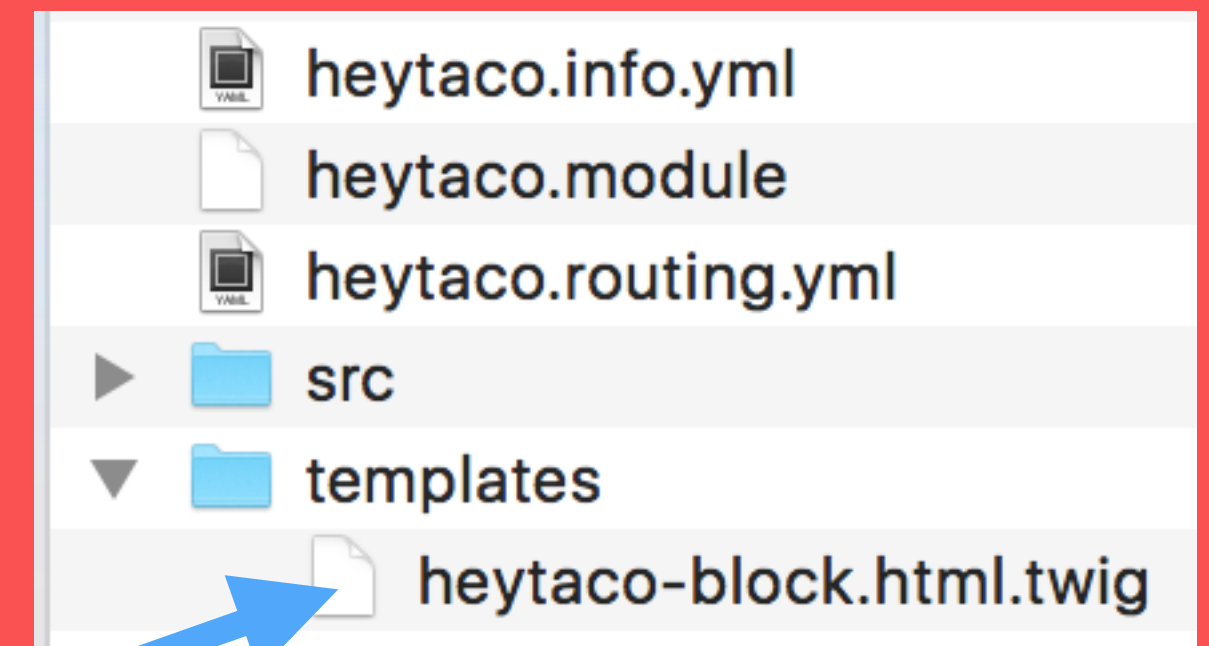
Theming

```
/**
 * {@inheritdoc}
 */
public function build() {
    // Dependency injection used create() and __construct() pattern.
    $user_id = $this->account->id();
    return array(
        '#theme' => 'heytao_block',
        '#results' => $this->returnLeaderboard($user_id),
        '#partner_asterisk_blurb' => $this->isNotPartnerBlurb($user_id),
        '#display_name' => $this->account->getUsername(),
        '#cache' => [
            'keys' => ['heytao_block'],
            'contexts' => ['user'],
            'tags' => ['user_list'],
            'max-age' => 3600,
        ],
    );
}
```

Theming

```
/**
 * {@inheritdoc}
 */
public function build() {
    // Dependency injection used create() and __construct() pattern.
    $user_id = $this->account->id();
    return array(
        '#theme' => 'heytao_block',
        '#results' => $this->returnLeaderboard($user_id),
        '#partner_asterisk_blurb' => $this->isNotPartnerBlurb($user_id),
        '#display_name' => $this->account->getUsername(),
        '#cache' => [
            'keys' => ['heytao_block'],
            'contexts' => ['user'],
            'tags' => ['user_list'],
            'max-age' => 3600,
        ],
    );
}
```

heytao.module



```
/**
 * Implements hook_theme().
 */
function heytao_theme($existing, $type, $theme, $path) {
  return array(
    'heytao_block' => array(
      'variables' => array(
        'results' => NULL,
        'partner_asterisk_blurb' => NULL,
        'display_name' => NULL
      ),
    ),
  );
};
}
```

heytaaco-block.html.twig

HeyTaco! Leaderboard

Hi Märt Matsoo!

1. chrisfree **486** *
2. davelook **386** *
3. alanna **363**
4. ryanhagerty **357**
5. markdorison **341** *
6. larrywalangitan **306**
7. adam **297**
8. guschilds **270**
9. Märt Matsoo **234**
10. ctorgalson **229**

* Partners' results padded by 100 tacos

```
<h2>HeyTaco! Leaderboard</h2>
{% if display_name|render is not empty %}
  <h3>Hi {{ display_name }}!</h3>
{% endif %}
<ol>
  {% for result in results %}
    <li>{{ result.name }} <strong>{{ result.score }} {{ result.asterisk }}</strong></li>
  {% endfor %}
</ol>

{% if partner_asterisk_blurb|render is not empty %}
  <small>{{ partner_asterisk_blurb }}</small>
{% endif %}
```

In Cache-tastic Conclusion

```
'#partner_asterisk_blurb' => $this->get('partner_asterisk_blurb'),  
'#cache' => [  
  'keys' => ['heytao_block'],  
  'contexts' => ['user'],  
  'tags' => ['user_list'],  
  'max-age' => 3600,  
],  
)
```

- Cache metadata: keys, contexts, tags, max-age
- Render arrays and the #cache property go hand in hand
- Try different use cases to better grasp what each metadata piece does
- Sample code: <https://github.com/ChromaticHQ/heytao>

Thanks!

Märt Matsoo

twitter @mmatsoo

Chromatic

<https://chromatichq.com>