Writing Secure Code

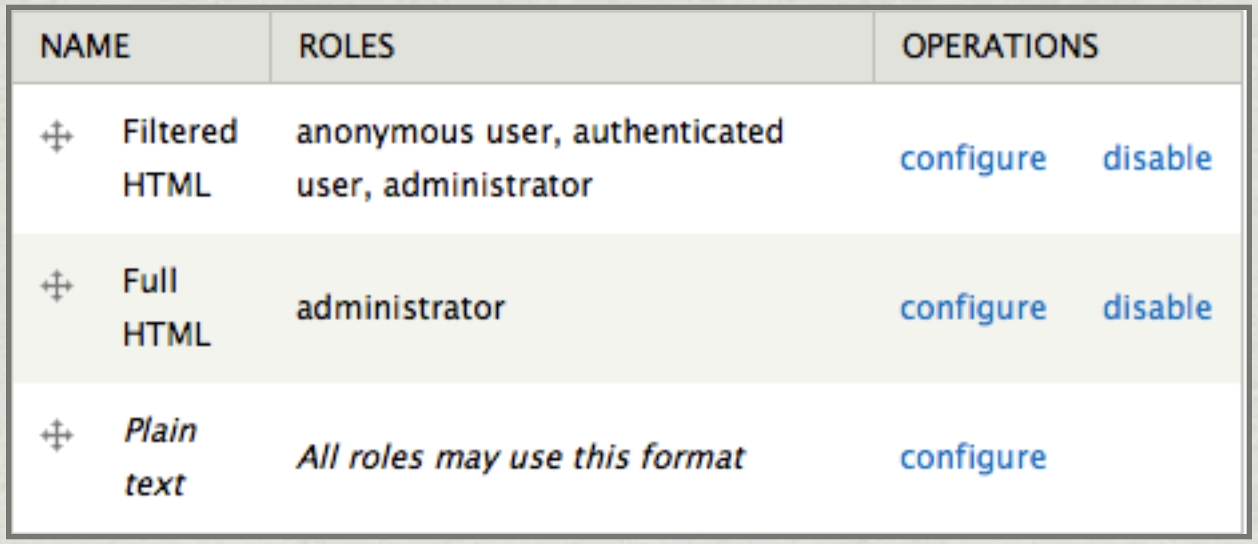
Wash all user-submitted data

Vulnerabilities

- XSS - Cross-site scripting
  Executing unauthorized code
- XSRF - Cross-site request forgery
  Remote execution for logged-in users
- SQL Injection
  A malicious variable placed into a query

How Drupal Handles Input

- Data is saved as-is into the database.
- Data gets 'washed' on output.

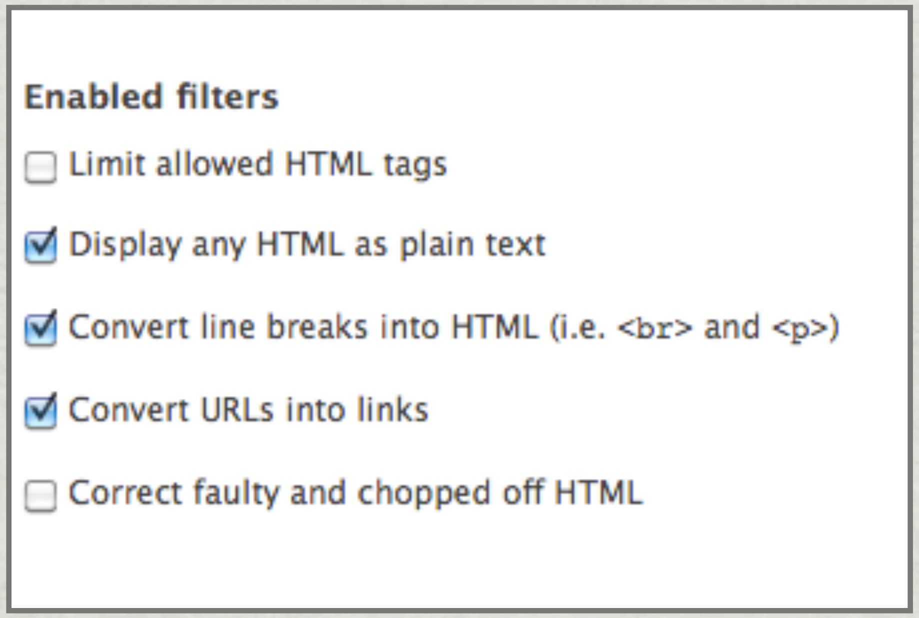


NAME	ROLES	OPERATIONS	
Filtered HTML	anonymous user, authenticated user, administrator	configure	disable
Full HTML	administrator	configure	disable
Plain text	*All roles may use this format*	configure	

- Burden lies with module and theme developers.
- Drupal gives you the tools. You must use them.

Text Formats

- /admin/config/content/formats
- Plain Text Filters
  - Display any HTML as plain text
    - <div class=”blue”>Hello!</div> becomes &lt;div class="blue"&gt;Hello!&lt;/div&gt;



Enabled filters

- [ ] Limit allowed HTML tags
- [✓] Display any HTML as plain text
- [✓] Convert line breaks into HTML (i.e.
 and <p>)
- [✓] Convert URLs into links
- [ ] Correct faulty and chopped off HTML

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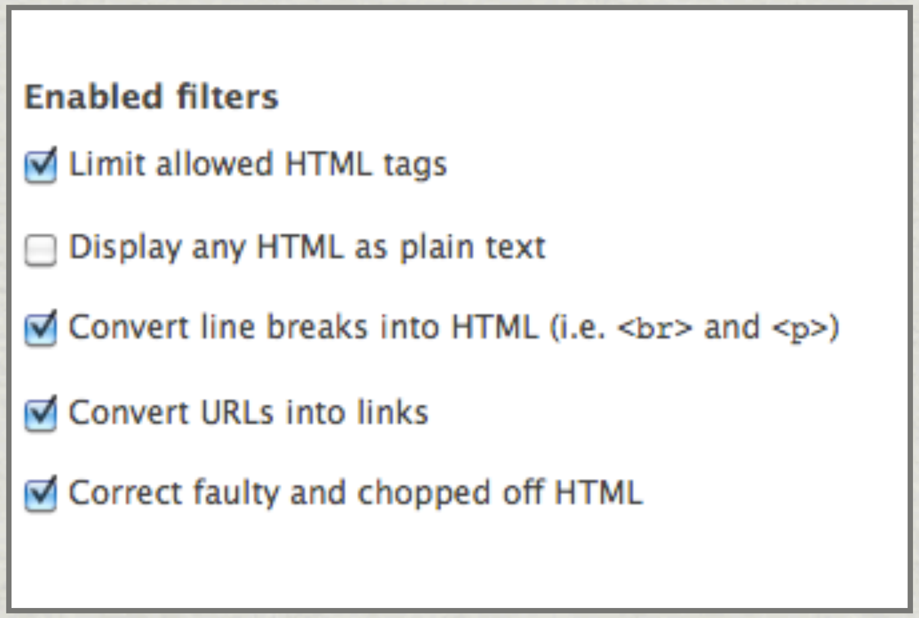
Text Formats

- /admin/config/content/formats
- Filtered HTML Filters
  - Limit allowed HTML tags
    - <a> <em> <strong> <cite> <blockquote> <code> <ul> <ol> <li> <dl> <dt> <dd>
    - JavaScript event attributes, JavaScript URLs, and CSS are always stripped.
    - <div class=”blue”>Hello!</div> becomes Hello!
      <code class="blue" style="border:1px;">Hello!</code> becomes
      <code class=”blue”>Hello!</code>



Enabled filters

- [✓] Limit allowed HTML tags
- [ ] Display any HTML as plain text
- [✓] Convert line breaks into HTML (i.e.
 and <p>)
- [✓] Convert URLs into links
- [✓] Correct faulty and chopped off HTML

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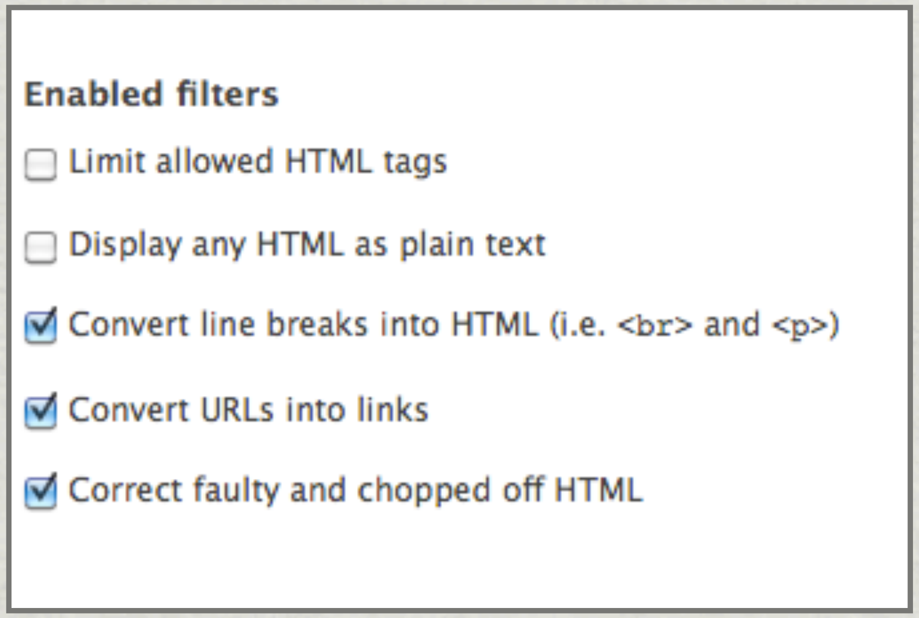
Text Formats

- /admin/config/content/formats
- Full HTML Filters

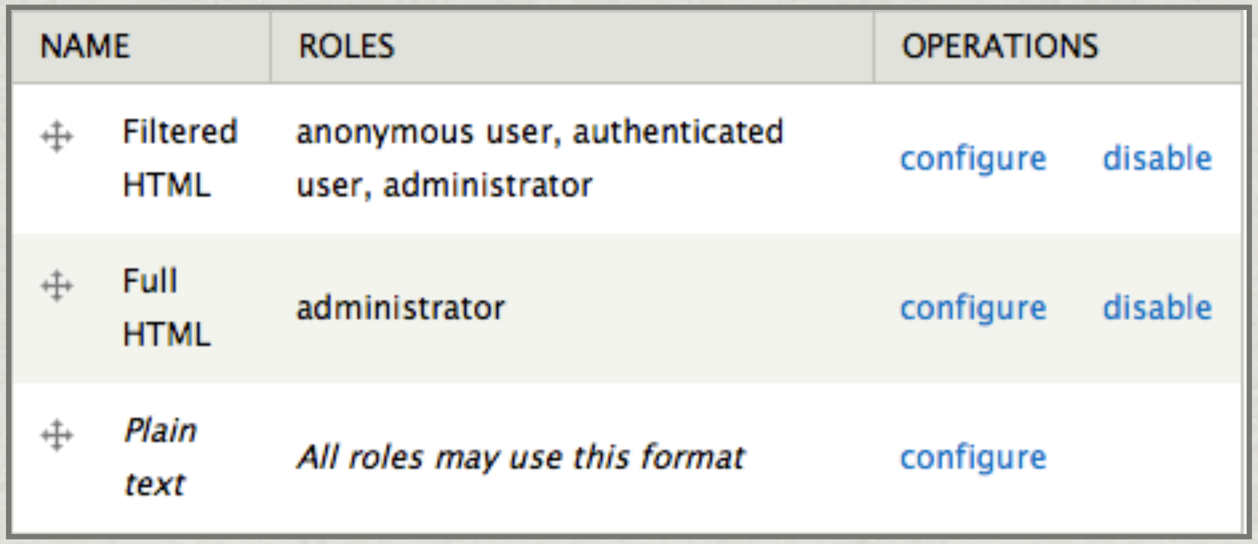


Enabled filters

- [ ] Limit allowed HTML tags
- [ ] Display any HTML as plain text
- [x] Convert line breaks into HTML (i.e. `<br>` and `<p>`)
- [x] Convert URLs into links
- [x] Correct faulty and chopped off HTML

How You Handle Output

- Burden lies with module and theme developers.
- Drupal gives you the tools. You must use them.



NAME	ROLES	OPERATIONS	
Filtered HTML	anonymous user, authenticated user, administrator	configure	disable
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Plain text	*All roles may use this format*	configure	

Wash Your Output

- http://api.drupal.org/api/drupal/includes--common.inc/group/sanitization/7
- check_plain()
- check_markup()
- check_url() & l()
- t()
- filter_xss()
- filter_xss_admin()

check_plain($text)

- To be used when inserting plain text into HTML.
- No HTML is output.
- Uses the encoded special characters instead.
- <a href='test'>Test</a>
- &lt;a href=&#039;test&#039;&gt;Test&lt;/a&gt;

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check_markup($text, $format_id = NULL, $langcode = '', $cache = FALSE)

- To be used when inserting rich text into HTML.
- Allows you to specify the format ID that corresponds with the 'text format' you want to use.
- Falls back to the system default.
- $newtext = check_markup($text, 'filtered_html');

check_url($uri) l($text, $path, array $options = array())

- check_url() Strips dangerous protocols (e.g. 'javascript:') from a URI and encodes it for output to an HTML attribute value.
  - Allows 'ftp', 'http', 'https', 'irc', 'mailto', 'news', 'nntp', 'rtsp', 'sftp', 'ssh', 'tel', 'telnet', 'webcal'
- l() constructs a full HTML link utilizing url() for the href attribute and also sanitizes the link title.

t($string, $args = array(), $options = array())

- Allows strings to be translatable.
- Must use variable substitution for ANY variable.
- $text = t("@name's blog", array('@name' => format_username($account)));
  - !variable: Inserted as is. Use this for text that has already been sanitized.
  - @variable: Escaped to HTML using check_plain(). Use this for anything displayed on a page on the site.
  - %variable: Escaped as a placeholder for user-submitted content using drupal_placeholder(), which shows up as <em>emphasized</em> text.

filter_xss($string, $allowed_tags = array('a', 'em', 'strong', 'cite', 'blockquote', 'code', 'ul', 'ol', 'li', 'dl', 'dt', 'dd'))

- Filters an HTML string to prevent cross-site-scripting (XSS) vulnerabilities.
  - Removes characters and constructs that can trick browsers.
  - Makes sure all HTML entities are well-formed.
  - Makes sure all HTML tags and attributes are well-formed.
  - Makes sure no HTML tags contain URLs with a disallowed protocol (e.g. javascript:).

filter_xss_admin($string)

- Very permissive XSS/HTML filter for admin-only use.
- Use only for fields where it is impractical to use the whole filter system, but where some (mainly inline) mark-up is desired (so check_plain() is not acceptable).
- Allows all tags that can be used inside an HTML body, save for scripts and styles.

Sending Email

- drupal_mail($module, $key, $to, $language, $params = array(), $from = NULL, $send = TRUE);
- Sending an e-mail works with defining an e-mail template (subject, text and possibly e-mail headers) and the replacement values to use in the appropriate places in the template.
  - Doesn’t allow headers to be injected.
    - Users cannot add a Bcc via the subject line

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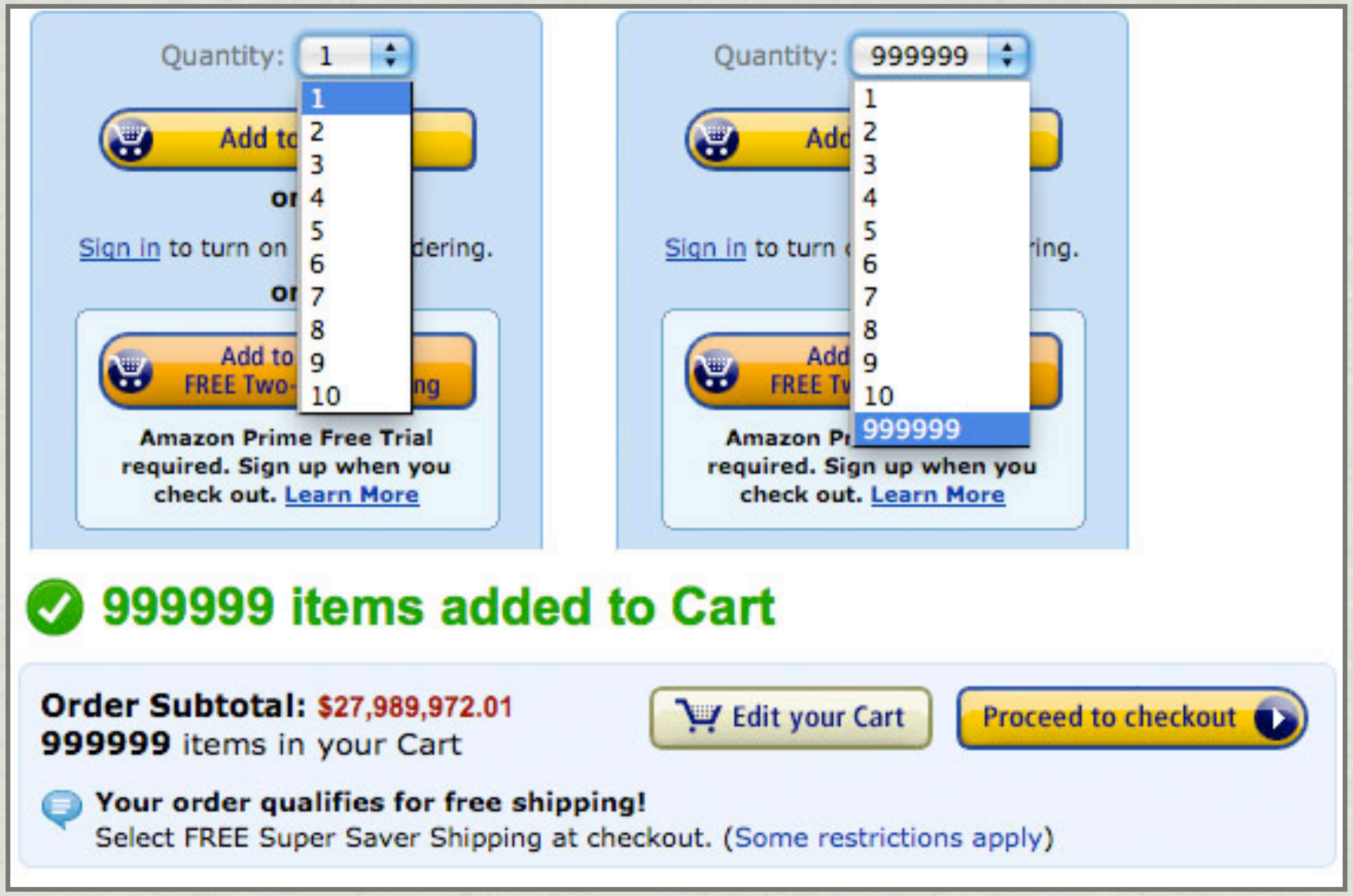
Drupal Forms

- Drupal Forms API (FAPI) protects against XSRF using a token and session system that checks for validity of POST data.



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Order Subtotal: $27,989,972.01
999999 items in your Cart

Your order qualifies for free shipping!
Select FREE Super Saver Shipping at checkout. (Some restrictions apply)

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SQL Injection

- The query builder with variable replacement uses the database API to safely handle the data

-
  ```
  db_merge('example')
    ->key(array('name' => $name))
    ->fields(array(
        'field1' => $value1,
        'field2' => $value2,))
    ->execute();
  ```

HI, THIS IS YOUR SON'S SCHOOL. WE'RE HAVING SOME COMPUTER TROUBLE.
OH, DEAR – DID HE BREAK SOMETHING?
IN A WAY–
DID YOU REALLY NAME YOUR SON Robert'); DROP TABLE Students;-- ?
OH. YES. LITTLE BOBBY TABLES, WE CALL HIM.
WELL, WE'VE LOST THIS YEAR'S STUDENT RECORDS. I HOPE YOU'RE HAPPY.
AND I HOPE YOU'VE LEARNED TO SANITIZE YOUR DATABASE INPUTS.
http://xkcd.com/327

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Wash All User-submitted Data On Output

- Don’t trust what people enter in your site.
- Use the tools that Drupal provides to protect yourself against vulnerabilities.
- Documentation
  http://drupal.org/writing-secure-code
- Sanitization functions
  http://api.drupal.org/api/drupal/includes--common.inc/group/sanitization/7