DataTables example Pipelining data to reduce Ajax calls for paging

Server-side processing can be quite hard on your server, since it makes an Ajax call to the server for every draw request that is made. On sites with a large number of page views, you could potentially end up DDoSing your own server with your own applications!

This example shows one technique to reduce the number of Ajax calls that are made to the server by caching more data than is needed for each draw. This is done by intercepting the Ajax call and routing it through a data cache control; using the data from the cache if available, and making the Ajax request if not. This intercept of the Ajax request is performed by giving the [ajax](http://datatables.net/reference/option/ajax) option as a function. This function then performs the logic of deciding if another Ajax call is needed, or if data from the cache can be used.

Keep in mind that this caching is for paging only; the pipeline must be cleared for other interactions such as ordering and searching since the full data set, when using server-side processing, is only available at the server.

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| --- | --- | --- | --- | --- | --- |
| First name | Last name | Position | Office | Start date | Salary |
| First name | Last name | Position | Office | Start date | Salary |

* Javascript
* HTML
* CSS
* Ajax
* Server-side script

The Javascript shown below is used to initialise the table shown in this example:

// // Pipelining function for DataTables. To be used to the `ajax` option of DataTables // $.fn.dataTable.pipeline = function ( opts ) { // Configuration options var conf = $.extend( { pages: 5, // number of pages to cache url: '', // script url data: null, // function or object with parameters to send to the server // matching how `ajax.data` works in DataTables method: 'GET' // Ajax HTTP method }, opts ); // Private variables for storing the cache var cacheLower = -1; var cacheUpper = null; var cacheLastRequest = null; var cacheLastJson = null; return function ( request, drawCallback, settings ) { var ajax = false; var requestStart = request.start; var drawStart = request.start; var requestLength = request.length; var requestEnd = requestStart + requestLength; if ( settings.clearCache ) { // API requested that the cache be cleared ajax = true; settings.clearCache = false; } else if ( cacheLower < 0 || requestStart < cacheLower || requestEnd > cacheUpper ) { // outside cached data - need to make a request ajax = true; } else if ( JSON.stringify( request.order ) !== JSON.stringify( cacheLastRequest.order ) || JSON.stringify( request.columns ) !== JSON.stringify( cacheLastRequest.columns ) || JSON.stringify( request.search ) !== JSON.stringify( cacheLastRequest.search ) ) { // properties changed (ordering, columns, searching) ajax = true; } // Store the request for checking next time around cacheLastRequest = $.extend( true, {}, request ); if ( ajax ) { // Need data from the server if ( requestStart < cacheLower ) { requestStart = requestStart - (requestLength\*(conf.pages-1)); if ( requestStart < 0 ) { requestStart = 0; } } cacheLower = requestStart; cacheUpper = requestStart + (requestLength \* conf.pages); request.start = requestStart; request.length = requestLength\*conf.pages; // Provide the same `data` options as DataTables. if ( $.isFunction ( conf.data ) ) { // As a function it is executed with the data object as an arg // for manipulation. If an object is returned, it is used as the // data object to submit var d = conf.data( request ); if ( d ) { $.extend( request, d ); } } else if ( $.isPlainObject( conf.data ) ) { // As an object, the data given extends the default $.extend( request, conf.data ); } settings.jqXHR = $.ajax( { "type": conf.method, "url": conf.url, "data": request, "dataType": "json", "cache": false, "success": function ( json ) { cacheLastJson = $.extend(true, {}, json); if ( cacheLower != drawStart ) { json.data.splice( 0, drawStart-cacheLower ); } if ( requestLength >= -1 ) { json.data.splice( requestLength, json.data.length ); } drawCallback( json ); } } ); } else { json = $.extend( true, {}, cacheLastJson ); json.draw = request.draw; // Update the echo for each response json.data.splice( 0, requestStart-cacheLower ); json.data.splice( requestLength, json.data.length ); drawCallback(json); } } }; // Register an API method that will empty the pipelined data, forcing an Ajax // fetch on the next draw (i.e. `table.clearPipeline().draw()`) $.fn.dataTable.Api.register( 'clearPipeline()', function () { return this.iterator( 'table', function ( settings ) { settings.clearCache = true; } ); } ); // // DataTables initialisation // $(document).ready(function() { $('#example').DataTable( { "processing": true, "serverSide": true, "ajax": $.fn.dataTable.pipeline( { url: 'scripts/server\_processing.php', pages: 5 // number of pages to cache } ) } ); } );

In addition to the above code, the following Javascript library files are loaded for use in this example:

* [//code.jquery.com/jquery-1.12.3.min.js](http://code.jquery.com/jquery-1.12.3.min.js)
* [../../media/js/jquery.dataTables.js](http://docs.google.com/media/js/jquery.dataTables.js)

The HTML shown below is the raw HTML table element, before it has been enhanced by DataTables:

This example uses a little bit of additional CSS beyond what is loaded from the library files (below), in order to correctly display the table. The additional CSS used is shown below:

The following CSS library files are loaded for use in this example to provide the styling of the table:

* [../../media/css/jquery.dataTables.css](http://docs.google.com/media/css/jquery.dataTables.css)

This table loads data by Ajax. The latest data that has been loaded is shown below. This data will update automatically as any additional data is loaded.

The script used to perform the server-side processing for this table is shown below. Please note that this is just an example script using PHP. Server-side processing scripts can be written in any language, using [the protocol described in the DataTables documentation](http://datatables.net/manual/server-side).

Other examples

[**Basic initialisation**](http://docs.google.com/basic_init/index.html)

* [Zero configuration](http://docs.google.com/basic_init/zero_configuration.html)
* [Feature enable / disable](http://docs.google.com/basic_init/filter_only.html)
* [Default ordering (sorting)](http://docs.google.com/basic_init/table_sorting.html)
* [Multi-column ordering](http://docs.google.com/basic_init/multi_col_sort.html)
* [Multiple tables](http://docs.google.com/basic_init/multiple_tables.html)
* [Hidden columns](http://docs.google.com/basic_init/hidden_columns.html)
* [Complex headers (rowspan and colspan)](http://docs.google.com/basic_init/complex_header.html)
* [DOM positioning](http://docs.google.com/basic_init/dom.html)
* [Flexible table width](http://docs.google.com/basic_init/flexible_width.html)
* [State saving](http://docs.google.com/basic_init/state_save.html)
* [Alternative pagination](http://docs.google.com/basic_init/alt_pagination.html)
* [Scroll - vertical](http://docs.google.com/basic_init/scroll_y.html)
* [Scroll - vertical, dynamic height](http://docs.google.com/basic_init/scroll_y_dynamic.html)
* [Scroll - horizontal](http://docs.google.com/basic_init/scroll_x.html)
* [Scroll - horizontal and vertical](http://docs.google.com/basic_init/scroll_xy.html)
* [Language - Comma decimal place](http://docs.google.com/basic_init/comma-decimal.html)
* [Language options](http://docs.google.com/basic_init/language.html)

[**Advanced initialisation**](http://docs.google.com/advanced_init/index.html)

* [DOM / jQuery events](http://docs.google.com/advanced_init/events_live.html)
* [DataTables events](http://docs.google.com/advanced_init/dt_events.html)
* [Column rendering](http://docs.google.com/advanced_init/column_render.html)
* [Page length options](http://docs.google.com/advanced_init/length_menu.html)
* [Multiple table control elements](http://docs.google.com/advanced_init/dom_multiple_elements.html)
* [Complex headers with column visibility](http://docs.google.com/advanced_init/complex_header.html)
* [Read HTML to data objects](http://docs.google.com/advanced_init/object_dom_read.html)
* [HTML5 data-\* attributes - table options](http://docs.google.com/advanced_init/html5-data-options.html)
* [HTML5 data-\* attributes - cell data](http://docs.google.com/advanced_init/html5-data-attributes.html)
* [Language file](http://docs.google.com/advanced_init/language_file.html)
* [Setting defaults](http://docs.google.com/advanced_init/defaults.html)
* [Row created callback](http://docs.google.com/advanced_init/row_callback.html)
* [Row grouping](http://docs.google.com/advanced_init/row_grouping.html)
* [Footer callback](http://docs.google.com/advanced_init/footer_callback.html)
* [Custom toolbar elements](http://docs.google.com/advanced_init/dom_toolbar.html)
* [Order direction sequence control](http://docs.google.com/advanced_init/sort_direction_control.html)

[**Styling**](http://docs.google.com/styling/index.html)

* [Base style](http://docs.google.com/styling/display.html)
* [Base style - no styling classes](http://docs.google.com/styling/no-classes.html)
* [Base style - cell borders](http://docs.google.com/styling/cell-border.html)
* [Base style - compact](http://docs.google.com/styling/compact.html)
* [Base style - hover](http://docs.google.com/styling/hover.html)
* [Base style - order-column](http://docs.google.com/styling/order-column.html)
* [Base style - row borders](http://docs.google.com/styling/row-border.html)
* [Base style - stripe](http://docs.google.com/styling/stripe.html)
* [Bootstrap 3](http://docs.google.com/styling/bootstrap.html)
* [Foundation](http://docs.google.com/styling/foundation.html)
* [jQuery UI ThemeRoller](http://docs.google.com/styling/jqueryUI.html)
* [Bootstrap 4 (Tech. preview)](http://docs.google.com/styling/bootstrap4.html)
* [Semantic UI (Tech. preview)](http://docs.google.com/styling/semanticui.html)
* [Material Design (Tech. preview)](http://docs.google.com/styling/material.html)
* [UIKit (Tech. preview)](http://docs.google.com/styling/uikit.html)

[**Data sources**](http://docs.google.com/data_sources/index.html)

* [HTML (DOM) sourced data](http://docs.google.com/data_sources/dom.html)
* [Ajax sourced data](http://docs.google.com/data_sources/ajax.html)
* [Javascript sourced data](http://docs.google.com/data_sources/js_array.html)
* [Server-side processing](http://docs.google.com/data_sources/server_side.html)

[**API**](http://docs.google.com/api/index.html)

* [Add rows](http://docs.google.com/api/add_row.html)
* [Individual column searching (text inputs)](http://docs.google.com/api/multi_filter.html)
* [Individual column searching (select inputs)](http://docs.google.com/api/multi_filter_select.html)
* [Highlighting rows and columns](http://docs.google.com/api/highlight.html)
* [Child rows (show extra / detailed information)](http://docs.google.com/api/row_details.html)
* [Row selection (multiple rows)](http://docs.google.com/api/select_row.html)
* [Row selection and deletion (single row)](http://docs.google.com/api/select_single_row.html)
* [Form inputs](http://docs.google.com/api/form.html)
* [Index column](http://docs.google.com/api/counter_columns.html)
* [Show / hide columns dynamically](http://docs.google.com/api/show_hide.html)
* [Using API in callbacks](http://docs.google.com/api/api_in_init.html)
* [Scrolling and Bootstrap tabs](http://docs.google.com/api/tabs_and_scrolling.html)
* [Search API (regular expressions)](http://docs.google.com/api/regex.html)

[**Ajax**](http://docs.google.com/ajax/index.html)

* [Ajax data source (arrays)](http://docs.google.com/ajax/simple.html)
* [Ajax data source (objects)](http://docs.google.com/ajax/objects.html)
* [Nested object data (objects)](http://docs.google.com/ajax/deep.html)
* [Nested object data (arrays)](http://docs.google.com/ajax/objects_subarrays.html)
* [Orthogonal data](http://docs.google.com/ajax/orthogonal-data.html)
* [Generated content for a column](http://docs.google.com/ajax/null_data_source.html)
* [Custom data source property](http://docs.google.com/ajax/custom_data_property.html)
* [Flat array data source](http://docs.google.com/ajax/custom_data_flat.html)
* [Deferred rendering for speed](http://docs.google.com/ajax/defer_render.html)

[**Server-side**](http://docs.google.com/index.html)

* [Server-side processing](http://docs.google.com/simple.html)
* [Custom HTTP variables](http://docs.google.com/custom_vars.html)
* [POST data](http://docs.google.com/post.html)
* [Automatic addition of row ID attributes](http://docs.google.com/ids.html)
* [Object data source](http://docs.google.com/object_data.html)
* [Row details](http://docs.google.com/row_details.html)
* [Row selection](http://docs.google.com/select_rows.html)
* [JSONP data source for remote domains](http://docs.google.com/jsonp.html)
* [Deferred loading of data](http://docs.google.com/defer_loading.html)
* [Pipelining data to reduce Ajax calls for paging](http://docs.google.com/pipeline.html)

[**Plug-ins**](http://docs.google.com/plug-ins/index.html)

* [API plug-in methods](http://docs.google.com/plug-ins/api.html)
* [Ordering plug-ins (with type detection)](http://docs.google.com/plug-ins/sorting_auto.html)
* [Ordering plug-ins (no type detection)](http://docs.google.com/plug-ins/sorting_manual.html)
* [Custom filtering - range search](http://docs.google.com/plug-ins/range_filtering.html)
* [Live DOM ordering](http://docs.google.com/plug-ins/dom_sort.html)

Please refer to the [DataTables documentation](http://www.datatables.net) for full information about its API properties and methods.

Additionally, there are a wide range of [extensions](http://www.datatables.net/extensions) and [plug-ins](http://www.datatables.net/plug-ins) which extend the capabilities of DataTables.

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