

FROM HTMLDB\_GET TO PROMISES

# AJAX EXPLAINED



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# THE BASICS



## THE BASICS

### AJAX

- ▶ Asynchronous
- ▶ JavaScript
- ▶ And

X<sup>ML</sup>



# THE PAST



## THE PAST

### HTMldb\_GET

- ▶ Never documented
- ▶ But used all over for Partial Page Refresh
- ▶ Replaced by apex.server.process since 4.2
- ▶ Deprecated since 5.1

```
1 // synchronous
2 var ajaxRequest = new htmlDb_Get( null
3                                     , $v('pFlowId')
4                                     , 'APPLICATION_PROCESS=get_job'
5                                     , $v('pFlowStepId')
6                                     );
7 ajaxRequest.addParam('x01', 'ALLEN');
8 var ajaxResult = ajaxRequest.get();
9
10 // asynchronous
11 var ajaxRequest = new htmlDb_Get( null
12                                   , $v('pFlowId')
13                                   , 'APPLICATION_PROCESS=get_job'
14                                   , $v('pFlowStepId')
15                                   );
16 ajaxRequest.addParam('x01', 'ALLEN');
17 ajaxRequest.GetAsync(function(pResponse){
18     console.log(pResponse.readyState);
19     if(pResponse.readyState==4 && pResponse.status==200){
20         console.log(pResponse.responseText);
21     }
22 });
```

# THE PRESENT

THE PRESENT

## INTERACTIVE REPORT

Search

```
Headers Cookies Sizes Timing Security [Response] [Log]
: id="R39181871363865549_toolbar" class="a-IRR-toolbar">
<div id="R39181871363865549_toolbar_controls" class="a-IRR-controls">
<div class="a-IRR-controlGroup a-IRR-controlGroup-search">
<input type="hidden" id="R39181871363865549_column_search_current_column"/>
<div class="a-IRR-cs-select">
<button id="R39181871363865549_column_search_root" data-
="R39181871363865549_column_search_drop" class="a-IRR-button a-IRR-button-collapse js-multit
="Select columns to search" aria-label="Select columns to search" type="button">
<span class="a-IRR-icon-search" aria-hidden="true"/></span>
<span class="a-IRR-icon-menu-drop-down" aria-hidden="true"/></span>
</button>
</div>
<div class="a-IRR-searchFieldContainer">
<input class="a-IRR-search-field" id="R39181871363865549_search_field" title="Search Rep
="text" size="38" maxlength="4000" value="" />
</div>
<div class="a-IRR-searchButtonContainer">
<button id="R39181871363865549_search_button" class="a-IRR-button a-IRR-button-act
="button">
<span>Go</span>
</button>
</div>
</div>
<div class="a-IRR-controlGroup a-IRR-controlGroup-view"></div>
<div class="a-IRR-controlGroup a-IRR-controlGroup-action">
<input type="hidden" id="R39181871363865549_row_select" value="58"/>
<div class="a-IRR-action">
<button id="R39181871363865549_actions_button" class="a-IRR-button a-IRR-button-act
="button" type="button" data-menu="R39181871363865549_actions_menu">
Actions
<span class="a-IRR-icon-menu-drop-down"/></span>
</button>
</div>
</div>
</div>
<div>
</div>
</div>
<div id="R39181871363865549_content" class="a-IRR-content">
</div>
</div>
<div id="R39181871363865549_dialog_js" class="a-IRR-dialogBody" style="display:none"></div>
<input type="hidden" id="R39181871363865549_worksheet_id" value="R39181871363865549"/>
<input type="hidden" id="R39181871363865549_app_user" value="DM07"/>
<input type="hidden" id="R39181871363865549_report_id" value="R39181871363865549"/>
<input type="hidden" id="R39181871363865549_view_mode" value="REPORT"/>
<style id="R39181871363865549_worksheet_css" type="text/css">
</style>
</div>
<div id="R39181871363865549_chart" class="a-IRR-chartView"></div>
<div id="R39181871363865549_views" class="a-IRR-groupByView"></div>
<div id="R39181871363865549_data_panel" class="a-IRR-reportView">
<div class="a-IRR-tblContainer">
<table aria-label="Region = Report 1, Report = Primary Default, View = Report, Displayed Rows Str
layed Row End = 14" class="a-IRR-table" id="R39181871363865549">
</table>
</div>
</div>
```

THE PRESENT

## INTERACTIVE REPORT

Search

LOV Filter

```
{
  "dialog": {
    "id": "39182399712065556",
    "hide": [
      "R39181871363865549_sort_widget_action_help",
      "R39181871363865549_sort_widget_action_computation"
    ],
    "coltype": "STRING",
    "filter": false,
    "uv": true,
    "row": [
      {
        "D": "ADAMS",
        "R": "ADAMS"
      },
      {
        "D": "ALLEN",
        "R": "ALLEN"
      },
      {
        "D": "BLAKE",
        "R": "BLAKE"
      },
      {
        "D": "CLARK",
        "R": "CLARK"
      },
      {
        "D": "FORD",
        "R": "FORD"
      }
    ]
  }
}
```

THE PRESENT

## INTERACTIVE REPORT

Search

LOV filter

Chart

```
{
  "type": "bar",
  "animationOnDisplay": "alphaFade",
  "animationOnDataChange": "auto",
  "hoverBehavior": "dim",
  "xAxis": {
    "majorTick": {
      "rendered": "on"
    },
    "minorTick": {
      "rendered": "on"
    }
  },
  "yAxis": {
    "tickLabel": {
      "rendered": "on"
    },
    "position": "outside",
    "rotation": "auto",
    "converter": {
      "scaling": "none"
    }
  },
  "orientation": "vertical",
  "zoomAndScroll": "delayed",
  "selectionMode": "single",
  "valueFormats": {
    "value": {
      "converter": {

```

THE PRESENT

# INTERACTIVE REPORT

- ▶ Search
- ▶ LOV filter
- ▶ Chart

```

<div id="K3376213433797534_toolbar" class="a-frm-toolbar">
  <div id="K3376213433797534_toolbar_controls" class="a-IR-controls">
    <div class="a-IR-controlGroup">
      <input type="hidden" id="K3376213433797534_colun_search_current_colun"/>
      <div class="a-IR-select">
        <button id="K3376213433797534_colun_search_reset" data-
        title="Select columns to search" aria-label="Select columns to search" type="button">
          <span class="a-Icon icon-menu-drop-down" aria-hidden="true"/>
        </button>
      </div>
      <div class="a-IR-searchFieldContainer">
        <input class="a-IR-search-field" id="K3376213433797534_search_field" title="Search Report"
        type="text" size="30" value="" />
      </div>
      <div class="a-IR-searchButtonContainer">
        <button id="K3376213433797534_search_button" class="a-button a-IR-button a-IR-button-search"
        type="button">
          <span></span>
        </button>
      </div>
      <div class="a-IR-controlGroup a-IR-controlGroup-view">
        <div class="a-IR-viewSelector">
          <div class="a-IR-view">
            <button id="K3376213433797534_report_view" type="button" class="a-button a-IR-button a-IR-
            button-view" data-view="report" title="View Report" aria-label="View Report">
              <span class="a-Icon icon-view-report" aria-hidden="true"/>
            </button>
            <button id="K3376213433797534_chart_view" type="button" class="a-button a-IR-button a-IR-
            button-view is-active" data-view="chart" title="View Chart" aria-label="View Chart">
              <span class="a-Icon icon-view-chart" aria-hidden="true"/>
            </button>
          </div>
        </div>
      </div>
      <div class="a-IR-controlGroup a-IR-controlGroup-options">
        <input type="hidden" id="K3376213433797534_no_select" value="N"/>
        <div class="a-IR-actions">
          <button id="K3376213433797534_actions_button" class="a-button a-IR-button a-IR-button-actions js-
          menuButton" type="button" data-menu="K3376213433797534_actions_menu">
            <span class="a-Icon icon-menu-drop-down"/>
          </button>
        </div>
      </div>
    </div>
  </div>
</div>
<div id="K3376213433797534_content" class="a-IR-content">
  <div id="K3376213433797534_dialog_1" class="a-IR-dialogBox" style="display:none"/>
  <input type="hidden" id="K3376213433797534_pageIndex" value="1161319293547"/>
  <input type="hidden" id="K3376213433797534_app_user" value="DMP"/>
  <input type="hidden" id="K3376213433797534_report_id" value="20224619181392637"/>
  <input type="hidden" id="K3376213433797534_view_name" value="DMP1"/>
  <div class="a-MediaBlock a-IR-controlContainer" id="K3376213433797534_control_panel">
    <div class="a-MediaBlock-graphic">

```

THE PRESENT

# INTERACTIVE GRID

- ▶ Search

```

"regions": [
  {
    "id": "39181871363865549"
    "a laxIdentifier": "UKVHSU90IFRZUEV-fjMSMTqMDcKtzYzMDYjNTQ0/LIGebLJaj0pggRH1DueddA9rB-
    FpXOT3cdFhWJc9xp8BANS1ZnyhR1yBAH079nUN5i0ndVng9nBhXWJKS0w"
    "fetchDate": "1"
    "filters": [
      "ADAMS"
      "ALLEN"
      "BLAKE"
      "CLARK"
      "DOE"
      "FORD"
      "JAMES"
      "JONES"
      "KING"
      "MARTIN"
      "MILLER"
      "SCOTT"
      "SMITH"
      "TURNER"
      "WARD"
    ]
  }
]

```

THE PRESENT

# INTERACTIVE GRID

- ▶ Search

IR	Bytes Sent	Bytes Received	Resource Size
	↑ 1.43 KB Headers: 889 B Body: 576 B	↓ 12.4 KB Headers: 370 B Body: 12.00 KB	12.0 KB Compression: 1.00x MIME Type: text/html
IG	Bytes Sent	Bytes Received	Resource Size
	↑ 1.74 KB Headers: 913 B Body: 864 B	↓ 5.57 KB Headers: 363 B Body: 5.21 KB	5.20 KB Compression: 1.00x MIME Type: application/json

THE PRESENT

# INTERACTIVE GRID

- ▶ Search
- ▶ LOV Filter

```

{
  "regions": [
    {
      "id": "39181871363865549"
      "a laxIdentifier": "UKVHSU90IFRZUEV-fjMSMTqMDcKtzYzMDYjNTQ0/LIGebLJaj0pggRH1DueddA9rB-
      FpXOT3cdFhWJc9xp8BANS1ZnyhR1yBAH079nUN5i0ndVng9nBhXWJKS0w"
      "filters": [
        "ADAMS"
        "ALLEN"
        "BLAKE"
        "CLARK"
        "DOE"
        "FORD"
        "JAMES"
        "JONES"
        "KING"
        "MARTIN"
        "MILLER"
        "SCOTT"
        "SMITH"
        "TURNER"
        "WARD"
      ]
    }
  ]
}

```

# INTERACTIVE GRID

- ▶ Search
- ▶ LOV Filter

**IR**

Bytes Sent ↑ 1.33 KB Headers: 889 B Body: 473 B	Bytes Received ↓ 0.98 KB Headers: 370 B Body: 636 B	Resource Size 0.61 KB Compression: 0.98x MIME Type: text/html
--	--	--

**IG**

Bytes Sent ↑ 1.78 KB Headers: 913 B Body: 914 B	Bytes Received ↓ 0.70 KB Headers: 363 B Body: 358 B	Resource Size 0.34 KB Compression: 0.97x MIME Type: application/json
--	--	---

# INTERACTIVE GRID

- ▶ Search
- ▶ LOV Filter
- ▶ Chart

```

FetchData: {
  "FetchData": {
    "Values": [
      {
        "MARTIN": 1250
      },
      {
        "TURNER": 1500
      },
      {
        "KING": 5881
      },
      {
        "SCOTT": 3800
      },
      {
        "CLARK": 2450
      },
      {
        "JONES": 2975
      },
      {
        "SMITH": 860
      },
      {
        "JAMES": 950
      },
      {
        "Doe": null
      },
      {
        "BLAKE": 3800
      }
    ]
  }
}

```

# INTERACTIVE GRID

- ▶ Search
- ▶ LOV Filter
- ▶ Chart

**IR**

Bytes Sent ↑ 1.26 KB Headers: 889 B Body: 449 B	Bytes Received ↓ 1.96 KB Headers: 370 B Body: 4.64 KB	Resource Size 1.60 KB Compression: 1.00x MIME Type: text/html
--	--	--

**IG**

Bytes Sent ↑ 1.74 KB Headers: 913 B Body: 865 B	Bytes Received ↓ 0.89 KB Headers: 363 B Body: 550 B	Resource Size 0.53 KB Compression: 0.98x MIME Type: application/json
--	--	---

# INTERACTIVE GRID

- ▶ Search
- ▶ LOV Filter
- ▶ Chart
- ▶ Lazy Loading

Region   Attributes   Printing

Filter

Edit

Enabled

Performance

Lazy Loading

Appearance

Show Null Values as

Select First Row

Pagination

Type   Scroll

Show Total Row Count

# DYNAMIC ACTIONS

▶ Which actions support Ajax?

- Clear
- Close Region
- Collapse Tree
- Disable
- Enable
- Expand Tree
- Hide
- Open Region
- Refresh
- Set Focus
- Set Value
- Show
- Execute
  - Execute JavaScript Code
  - Execute Server-side Code
- Miscellaneous
  - Cancel Event
- Navigation
  - Cancel Dialog
  - Close Dialog
  - Submit Page
- Notification
  - Alert
  - Confirm
- Style
  - Add Class
  - Remove Class
  - Set Style
  - Show Legacy...

# DYNAMIC ACTIONS

▶ Which actions support Ajax?

- Clear
- Close Region
- Collapse Tree
- Disable
- Enable
- Expand Tree
- Hide
- Open Region
- Refresh
- Set Focus
- Set Value
- Show
- Execute
  - Execute JavaScript Code
  - Execute Server-side Code
- Miscellaneous
  - Cancel Event
- Navigation
  - Cancel Dialog
  - Close Dialog
  - Submit Page
- Notification
  - Alert
  - Confirm
- Style
  - Add Class
  - Remove Class
  - Set Style
  - Show Legacy...

# DYNAMIC ACTIONS

▶ Which actions support Ajax?

Action

Filter

Identification

Action Set Value

Settings

Set Type PL/SQL Function Body

PL/SQL Function Body

```
return wait_for_result(3);
```

Items to Submit

Escape Special Characters

Suppress Change Event

Affected Elements

Execution Options

Sequence 10

Event Call a long running function

Fire When Event Result is True

Fire on Initialization

Stop Execution On Error

Wait For Result

# DYNAMIC ACTIONS

▶ Which actions support Ajax?

▶ [DEMO - Sync vs Async](#)

Action

Filter

Identification

Action Set Value

Settings

Set Type PL/SQL Function Body

PL/SQL Function Body

```
return wait_for_result(3);
```

Items to Submit

Escape Special Characters

Suppress Change Event

Affected Elements

Execution Options

Sequence 10

Event Call a long running function

Fire When Event Result is True

Fire on Initialization

Stop Execution On Error

Wait For Result

# THE CODE



JAVASCRIPT ALERT !

APEX.SERVER.PROCESS

## THE CODE - BASIC

```
apex.server.process( "MY_PROCESS", {
  x01: "test",
  pageItems: "#P1_DEPTNO,#P1_EMPNO"
}, {
  success: function( data ) {
    // do something here
  },
  error: function( jqXHR, textStatus, errorThrown ) {
    // handle error
  }
} );
```

## THE CODE - SETTING AND GETTING DATA

```
apex.server.process( "MY_PROCESS", {
  pageItems: "#P3_DEPTNO"
}, {
  loadingIndicatorPosition : "page",
  success: function( data ) {
    apex.item( "P3_LOCATION" ).setValue( data.loc );
    apex.item( "P3_COUNT" ).setValue( data.count );
    apex.message.showPageSuccess( data.loc + " : " + data.count );
  },
  error: function( jqXHR, textStatus, errorThrown ) {
    // handle error
  }
} );
```



#### THE CODE - ALWAYS

```
apex.server.process( "MY_PROCESS", {
  pageItems: "#P3_DEPTNO"
}, {
  loadingIndicatorPosition : "page",
  success: function( data ) {
    apex.item( "P3_LOCATION" ).setValue( data.loc );
    apex.item( "P3_COUNT" ).setValue( data.count );
    apex.message.showPageSuccess( data.loc + " : " + data.count );
  },
  error: function( jqXHR, textStatus, errorThrown ) {
    // handle error
  }
} ).always( function(){
  top.apex.message.showPageSuccess( "Done" );
} );
```

#### THE CODE - RAISE ERROR

```
apex.server.process( "MY_nonexisting_PROCESS", {
  pageItems: "#P3_DEPTNO"
}, {
  loadingIndicatorPosition : "page",
  success: function( data ) {
    apex.item( "P3_LOCATION" ).setValue( data.loc );
    apex.item( "P3_COUNT" ).setValue( data.count );
    apex.message.showPageSuccess( data.loc + " : " + data.count );
  },
  error: function( jqXHR, textStatus, errorThrown ) {
    console.log( jqXHR, textStatus, errorThrown );
    apex.message.showErrors([ {
      type: "error",
      location: [ "page" ],
      message: "Something bad happened!"
    } ]);
  }
} ).always( function(){
  top.apex.message.showPageSuccess( "Done" );
} );
```

#### THE CODE - RAISE DB ERROR

```
apex.server.process( "MY_PROCESS", {
  pageItems: "#P3_DEPTNO"
}, {
  loadingIndicatorPosition : "page",
  success: function( data ) {
    apex.item( "P3_LOCATION" ).setValue( data.loc );
    apex.item( "P3_COUNT" ).setValue( data.count );
    apex.message.showPageSuccess( data.loc + " : " + data.count );
  }
} ).always( function(){
  top.apex.message.showPageSuccess( "Done" );
} );
```



ASYNCHRONICITY

PROMISES, PROMISES

#### THE CODE - PROMISES

```
apex.server.process( "MY_PROCESS", {
  pageItems: "#P3_DEPTNO"
}, {
  loadingIndicatorPosition : "page",
  success: function( data ) {
    apex.item( "P3_LOCATION" ).setValue( data.loc );
    apex.item( "P3_COUNT" ).setValue( data.count );
    apex.message.showPageSuccess( data.loc + " : " + data.count );
  }
} ).always( function(){
  top.apex.message.showPageSuccess( "Done" );
});

setTimeout( function(){ top.apex.message.hidePageSuccess(); }, 1000 );
```

#### THE CODE - PROMISES

```
apex.server.process( "MY_PROCESS", {
  pageItems: "#P3_DEPTNO"
}, {
  loadingIndicatorPosition : "page",
  success: function( data ) {
    apex.item( "P3_LOCATION" ).setValue( data.loc );
    apex.item( "P3_COUNT" ).setValue( data.count );
    apex.message.showPageSuccess( data.loc + " : " + data.count );
  }
} ).always( function(){
  top.apex.message.showPageSuccess( "Done" );
} ).then( function(){
  setTimeout( function(){ top.apex.message.hidePageSuccess(); }, 1000 );
});
```

#### THE CODE - PROMISES

```
var waitForMe = apex.server.process( "MY_PROCESS", {
  pageItems: "#P3_DEPTNO"
}, {
  loadingIndicatorPosition : "page",
  success: function( data ) {
    apex.item( "P3_LOCATION" ).setValue( data.loc );
    apex.item( "P3_COUNT" ).setValue( data.count );
    apex.message.showPageSuccess( data.loc + " : " + data.count );
  }
} );

waitForMe.then( function(){
  setTimeout( function(){ top.apex.message.hidePageSuccess(); }, 1000 );
} ).then( function(){
  apex.message("now I'm totally done!");
});

waitForMe.always( function(){
  top.apex.message.showPageSuccess( "Done" );
});
```

# Q & A

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