



**vtwsclib** – vtiger CRM Web Services  
Client Library  
version 1.4

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## Version History

Version	Release Date	Highlights
1.4	2009.09.23	* Added Java client library support
1.3	2009.09.22	* Added doInvoke API to invoke custom webservice functions
1.2	2009.03.28	* Added lastError API to get the last operation error information. * Changed doListTypes API result datastructure to Map instead of List.
1.1	2008.11.06	* Minor bug fix
1.0	2008.10.23	* Provide Basic API wrapper for Webservice support

## About

vtwsclib (vtiger CRM Web Services Client Library) provides wrapper classes to use vtiger CRM web services. Using this library you can write new application that integrate with vtiger CRM easily.

The current release of vtwsclib library provides web services client wrappers for PHP, JS and Python, Java languages.

## **Installation**

Unpack the `vtwsclib-x.y.zip` into the folder where your web services client application will reside.

## **Requirement**

You will need to enable the **php\_curl** extension when using PHP Client Library.

## PHP Client Library Overview

PHP Client wrapper (class `Vtiger_WSCClient`) provides the following functions:

- `doLogin`
- `doListTypes`
- `doDescribe`
- `doCreate`
- `doRetrieve`
- `doQuery`
- `doInvoke`
- `lastError`
- `toJSON`
- `toJSONString`

### Class overview

class `Vtiger_WSCClient` is defined in the file `vtwsclib/Vtiger/WSCClient.php`. Include this class in your PHP web services client application code as illustrated below

<b>Vtiger_WSCClient(url)</b>	
Parameters	url – vtiger CRM URL
Return value	Instantiates class object
Example	<pre>&lt;?php include_once('vtwsclib/Vtiger/WSCClient.php');  \$url = 'http://en.vtiger.com/wip';  \$client = new Vtiger_WSCClient(\$url);  ?&gt;</pre>


<b>Boolean doLogin(username, accesskey)</b>	
Parameters	username – vtiger CRM username accesskey – users unique key (See My Preferences in vtiger CRM as shown <a href="#">here</a> )
Return value	True – on success False – on failure
Details	This function initializes <code>Vtiger_WSCClient</code> with <code>sessionId</code> on successful login which is required for performing other operations.
Example	<pre>&lt;?php include_once('vtwsclib/Vtiger/WSCClient.php');  \$url = 'http://en.vtiger.com/wip'; \$client = new Vtiger_WSCClient(\$url);  \$login = \$client-&gt;doLogin('admin', 'KpS9EjNz16JtPmoe'); if(!\$login) echo 'Login Failed'; else echo 'Login Successful';  ?&gt;</pre>

## vtiger CRM User Preferences

**vtiger CRM 5**

[My Preferences](#)[Help](#)[About Us](#)[Sign Out \(admin\)](#)

[My Home Page](#) [Marketing](#) [Sales](#) [Support](#) [Analytics](#) [Inventory](#) [Tools](#) [Settings](#)



### My Preferences

Viewing details about the user "Administrator"

[View Audit Trail](#) [Edit](#)

#### 1. User Login & Role

User Name	admin	Admin	on
Password	<a href="#">Change Password</a>	Email	prasad@mail.localhost.com
Status	Active	First Name	
Currency	Dollar : \$	Last Name	Administrator
Default Lead View	Today	Role	CEO
Default Calendar View	This Week		

#### 2. More Information

#### 5. User Advanced Options

Reminder Interval	1 Minute	Access Key	KpS9EjNz16JtPmoe
-------------------	----------	------------	------------------



Object <b>doListTypes()</b>	
Parameters	
Return value	Module information accessible to logged in user.
Details	
Example	<pre> &lt;?php include_once('vtwsclib/Vtiger/WSClient.php');  \$url = 'http://en.vtiger.com/wip'; \$client = new Vtiger_WSClient(\$url);  \$login = \$client-&gt;doLogin('admin', 'KpS9EjNz16JtPmoe'); if(!\$login) echo 'Login Failed'; else {     \$modules = \$client-&gt;doListTypes();     foreach(\$modules as \$modulename =&gt; \$moduleinfo) {         echo "ModuleName: \$modulename\n&lt;BR&gt;";     } } ?&gt; </pre>

Object <b>doDescribe</b> (module)	
Parameters	module – module name
Return value	Details of the module as Map
Details	Information about fields of the module, permission to create, delete, update records of the module can be obtained.
Example	<pre> &lt;?php include_once('vtwsclib/Vtiger/WSClient.php');  \$url = 'http://en.vtiger.com/wip'; \$client = new Vtiger_WSClient(\$url);  \$login = \$client-&gt;doLogin('admin', 'Kps9EjNz16JtPmoe'); if(!\$login) echo 'Login Failed'; else {     \$modules = \$client-&gt;doListTypes();     foreach(\$modules as \$modulename =&gt; \$moduleinfo) {         \$describe = \$client-&gt;doDescribe(\$module);         \$cancreate = \$describe[createable];         \$canupdate = \$describe[updateable];         \$candelete = \$describe[deleteable];         \$canread   = \$describe[retrieveable];         \$fields    = \$describe[fields];     } } ?&gt; </pre>

<b>Object <code>doCreate</code>(module, valuesmap)</b>	
Parameters	module – module name valuesmap – field name and field value pairs
Return value	On successful creation New record information will be returned. Creation may fail if mandatory field name and value pair is not set.
Details	Creating new records in the module can be done using this method.
Example	<pre> &lt;?php include_once('vtwsclib/Vtiger/WSClient.php');  \$url = 'http://en.vtiger.com/wip'; \$client = new Vtiger_WSClient(\$url);  \$login = \$client-&gt;doLogin('admin', 'KpS9EjNz16JtPmoe'); if(!\$login) echo 'Login Failed'; else {     \$module = 'Leads';     \$record = \$client-&gt;doCreate(\$module,         Array('lastname'=&gt;'CRMLead', 'company'=&gt;'vtiger'));      if(\$record) {         \$recordid = \$client-&gt;getRecordId(\$record['id']);     } } ?&gt; </pre>
NOTE:	The server returns record['id'] in the format <moduleid>'x'<recordid>. Use method getRecordId method can be used to retrieve only the record id part from the returned record id from the server.

Object <b>doRetrieve(record)</b>	
Parameters	record – identifier having the format <b>&lt;moduleid&gt;'x'&lt;recordid&gt;</b>
Return value	If specified module record is found its information is returned otherwise False. Creation may fail if mandatory field name and value pair is not set.
Details	Retrieve information of existing record of the module.
Example	<pre> &lt;?php include_once('vtwsclib/Vtiger/WSClient.php');  \$url = 'http://en.vtiger.com/wip'; \$client = new Vtiger_WSClient(\$url);  \$login = \$client-&gt;doLogin('admin', 'KpS9EjNz16JtPmoe'); if(!\$login) echo 'Login Failed'; else {     // Retrieve Contacts record with id 110     \$record = '4x110';     \$recordInfo = \$client-&gt;doRetrieve(\$record);     if(\$recordInfo) {         \$lastname = \$recordInfo['lastname'];     } } ?&gt; </pre>

<b>Object doQuery(query)</b>	
Parameters	query – SELECT query to use for fetching the records.
Return value	
Details	Webservices provides custom subset of SQL support to work with vtiger CRM.
Example	<pre> &lt;?php include_once('vtwsclib/Vtiger/WSCClient.php');  \$url = 'http://en.vtiger.com/wip'; \$client = new Vtiger_WSCClient(\$url);  \$login = \$client-&gt;doLogin('admin', 'KpS9EjNz16JtPmoe'); if(!\$login) echo 'Login Failed'; else {     // Retrieve Accounts matching name 'vtiger'     \$query = "SELECT * FROM Accounts WHERE accountname LIKE 'vtiger'";     \$records = \$client-&gt;doQuery(\$query);      if(\$records) {         \$columns = \$client-&gt;getResultColumns(\$records);         foreach(\$records as \$record) {             // Process record information         }     } } ?&gt; </pre>
NOTE:	<p>Use getResultColumns API to retrieve column names available in the result records.</p> <p>Please refer the webservice documentation to know more about SQL format and support.</p>

Object <b>doInvoke</b> (method, params, type)	
Parameters	method – Name of the webservice method to invoke params – Parameters to the webservice method type – POST/GET transport type to use to invoke the method
Return value	
Details	This method provides the ability to invoke the custom webservice method that is exposed by REST interface.
Example	<pre> &lt;?php include_once('vtwsclib/Vtiger/WSClient.php');  \$url = 'http://en.vtiger.com/wip'; \$client = new Vtiger_WSClient(\$url);  \$login = \$client-&gt;doLogin('admin', 'KpS9EjNz16JtPmoe'); if(!\$login) echo 'Login Failed'; else {     \$response = \$client-&gt;doInvoke(         'custom_wsmethod',         array( 'firstparam' =&gt; 'F', 'secondparam' =&gt; 'S',             'POST')     );     \$wasError = \$client-&gt;lastError();     if(\$wasError) {         var_dump(\$client-&gt;lastError());     } else {         // Take action on \$response     } } ?&gt; </pre>

Object <code>lastError()</code>	
Parameters	
Return value	Map containing (code, message) if the last operation failed or else false
Details	
Example	<pre> &lt;?php include_once('vtwsclib/Vtiger/WSClient.php');  \$url = 'http://en.vtiger.com/wip'; \$client = new Vtiger_WSClient(\$url);  \$login = \$client-&gt;doLogin('admin', 'KpS9EjNz16JtPmoe'); if(!\$login) echo 'Login Failed'; else {     // Retrieve Accounts matching name 'vtiger'     \$query = "SELECT * FROM Accounts WHERE WRONGQUERY";     \$records = \$client-&gt;doQuery(\$query);     \$wasError= \$client-&gt;lastError();     if(\$wasError) {         echo \$wasError['code'] . ':' . \$wasError['message'];     } } ?&gt; </pre>
NOTE	The lastError information is reset after every operation is executed.

<b>Object toJSON(inputString)</b>	
Parameters	inputString – json format input string
Return value	PHP Array or Map or String
Details	Converts the given input JSON format string to PHP Object
Example	<pre> &lt;?php include_once('vtwsclib/Vtiger/WSClient.php');  \$url = 'http://en.vtiger.com/wip'; \$client = new Vtiger_WSClient(\$url);  \$phpmap = \$client-&gt;toJSON( '{ "A" : "B" }' ); ?&gt; </pre>
<b>String toJSONString(input)</b>	
Parameters	input – PHP Array or Map or String
Return value	JSON string
Details	Converts the given input to JSON format string
Example	<pre> &lt;?php include_once('vtwsclib/Vtiger/WSClient.php');  \$url = 'http://en.vtiger.com/wip'; \$client = new Vtiger_WSClient(\$url);  \$jsonstring = \$client-&gt;toJSONString( { 'a'=&gt;'ValueA' } ); ?&gt; </pre>



## Javascript Client Library Overview

The following script includes are required on your page to use web services through Javascript client:

```
<script type='text/javascript' src='vtwsclib/third-party/js/jquery.js'></script>
<script type='text/javascript' src='vtwsclib/third-party/js/md5.js'></script>
<script type='text/javascript' src='vtwsclib/Vtiger/WSClient.js'></script>
```

Javascript Client wrapper (Vtiger\_WSClient) provides the following functions:

- doLogin
- doListTypes
- doDescribe
- doCreate
- doRetrieve
- doQuery
- doInvoke
- lastError
- toJSON
- toJSONString

### Class overview

class Vtiger\_WSClient is defined in the file vtwsclib/Vtiger/WSClient.js

Vtiger_WSClient(url)	
Parameters	url – vtiger CRM URL
Return value	Instantiates class object
Example	<pre>&lt;script type='text/javascript'&gt; var url = 'http://en.vtiger.com/wip';  var client = new Vtiger_WSClient(url);  &lt;/script&gt;</pre>

<b>doLogin(username, accesskey, callback)</b>	
Parameters	username – vtiger CRM username accesskey – users unique key (See My Preferences in vtiger CRM as shown <a href="#">here</a> ) callback – callback argument (See details explained <a href="#">here</a> )
Callback First parameter	True – on success False – on failure
Details	Initializes Vtiger_WSClient with sessionId on successful login which is required for performing other operations. Function referenced via callback will be invoked.
Example	<pre> &lt;script type='text/javascript'&gt;  var url = 'http://en.vtiger.com/wip'; var client = new Vtiger_WSClient(url);  client.doLogin('admin', 'kps9EjNz16JtPmoe', callback); // postLogin function gets a call once request is completed  function postLogin(result, args) {     if(result) alert('Login was successful');     else alert('Login failed'); }  &lt;/script&gt; </pre>

## Callback Argument

Asynchronous calls are made to service using AJAX request by webservice client functions.

Hence callback function should be sent, which will be invoked after the response is obtained from the server.

The callback argument can be any of the following:

- Function Reference
- Callback map having the following format:
 

```

{
  'function' : <Function Reference>,
  'arguments' : {'arg1' : 'value1', 'arg2' : ['value2']}
}

```

Webservice function will invoke the callback function passing the result as the first parameter. If callback map was sent then the reference sent via 'function' key will be invoked with result as the first parameter and second parameter will be values referenced by 'arguments' key of the callback map.

<b>doListTypes(callback)</b>	
Parameters	callback – callback argument (See details explained <a href="#">here</a> )
Callback First parameter	Module information accessible to logged in user.
Details	
Example	<pre> &lt;script type='text/javascript'&gt; var url = 'http://en.vtiger.com/wip'; var client = new Vtiger_WSCClient(url);  client.doLogin('admin', 'Kps9EjNz16JtPmoe', postLogin); // postLogin function gets a call once request is completed  function postLogin(result, args) {     if(!result) alert('Login failed');     else getModules(); } function getModules() {     client.doListTypes(postGetModules);     // postGetModules gets a call once request is completed } function postGetModules(modules, args) {     if(modules) alert(client.toJSONString(modules)); }  &lt;/script&gt; </pre>

<b>doDescribe(module, callback)</b>	
Parameters	module – module name callback – callback argument (See details explained <a href="#">here</a> )
Callback First Parameter	Details of the module as Map
Details	Information about fields of the module, permission to create, delete, update records of the module can be obtained.
Example	<pre> &lt;script type='text/javascript'&gt; var url = 'http://en.vtiger.com/wip'; var client = new Vtiger_WSCClient(url);  client.doLogin('admin', 'KpS9EjNz16JtPmoe', postLogin); // postLogin function gets a call once request is completed  function postLogin(result, args) {     if(!result) alert('Login failed');     else getModuleDetails(); } function getModuleDetails() {     var module = 'Leads';     var callback = {         'function' : processModuleDetails,         'arguments': { 'moduleName' : module }     };     client.doDescribe(callback);     // processModuleDetails gets a call once request is completed } function processModuleDetails(result, args) {     var module = args.moduleName;     if(result)         alert('Module = ' + module + ', Details = ' +             client.toJSONString(result)); } &lt;/script&gt; </pre>

<b>doCreate(module, valuesmap, callback)</b>	
Parameters	module – module name valuesmap – field name and field value pairs callback – callback argument (See details explained <a href="#">here</a> )
Callback First Parameter	On successful creation New record information will be sent. Creation may fail if mandatory field name and value pair is not set.
Details	Creating new records in the module can be done using this method.
Example	<pre> &lt;script type='text/javascript'&gt; var url = 'http://en.vtiger.com/wip'; var client = new Vtiger_WSCClient(url);  client.doLogin('admin', 'KpS9EjNz16JtPmoe', postLogin); // postLogin function gets a call once request is completed  function postLogin(result, args) {     if(!result) alert('Login failed');     else createModuleRecord(); } function createModuleRecord() {     var module = 'Leads';     var valuesmap = {         'lastname' : 'CRMLead', 'company':'vtiger'     } ;     client.doCreate(module, valuesmap, afterCreateRecord);      // afterCreateRecord gets a call once request is completed } function afterCreateRecord(result, args) {     if(result)         alert('Record Id = ' + client.getRecordId(result.id)); } &lt;/script&gt; </pre>
NOTE:	The server returns record['id'] in the format <moduleid>'x'<recordid>. Use method getRecordId method can be used to retrieve only the record id part from the returned record id from the server.

<b>doRetrieve(record, callback)</b>	
Parameters	record – identifier having the format <b>&lt;moduleid&gt;'x'&lt;recordid&gt;</b> callback – callback argument (See details explained <a href="#">here</a> )
Callback First Parameter	If specified module record is found its information is sent, otherwise False Creation may fail if mandatory field name and value pair is not set.
Details	Retrieve information of existing record of the module.
Example	<pre> &lt;script type='text/javascript'&gt; var url = 'http://en.vtiger.com/wip'; var client = new Vtiger_WSClib(url);  client.doLogin('admin', 'KpS9EjNz16JtPmoe', postLogin); // postLogin function gets a call once request is completed  function postLogin(result, args) {     if(!result) alert('Login failed');     else getModuleRecord(); } function getModuleRecord() {     var record = '4x110';     client.doRetrieve(record, processModuleRecord);      // processModuleRecord gets a call once request is completed } function processModuleRecord(result, args) {     if(result)         alert('Record Id = ' + client.getRecordId(result.id)); } &lt;/script&gt; </pre>

<b>doQuery(query, callback)</b>	
Parameters	query – SELECT query to use for fetching the records. callback – callback argument (See details explained <a href="#">here</a> )
Callback First Parameter	Result sent from the server.
Details	Webservices provides custom subset of SQL support to work with vtiger CRM.
Example	<pre> &lt;script type='text/javascript'&gt; var url = 'http://en.vtiger.com/wip'; var client = new Vtiger_WSCClient(url);  client.doLogin('admin', 'kps9EjNz16JtPmoe', postLogin); // postLogin function gets a call once request is completed  function postLogin(result, args) {   if(!result) alert('Login failed');   else execQuery(); } function execQuery() {   var query = "SELECT * FROM Accounts " +     "WHERE accountname LIKE '%vtiger%' ";    client.doQuery(query, postExecQuery);    // postExecQuery gets a call once request is completed } function postExecQuery(result, args) {   if(result) {     var columns = client.getResultColumns(result);     alert('COLUMNS: ' + client.toJSONString(columns));     alert(client.toJSONString(result));   } } &lt;/script&gt; </pre>
NOTE:	Use getResultColumns API to retrieve column names available in the result records.  Please refer the webservices documentation to know more about SQL format and support.

<b>doInvoke(callback, method, params, type)</b>	
Parameters	callback – callback argument (See details explained <a href="#">here</a> ) method – Name of the webservice method to invoke params – Parameters to the webservice method type – POST/GET transport type to use to invoke the method
Callback First Parameter	Result sent from the server.
Details	This method provides the ability to invoke the custom webservice method that is exposed by REST interface.
Example	<pre> &lt;script type='text/javascript'&gt; var url = 'http://en.vtiger.com/wip'; var client = new Vtiger_WSCClient(url);  client.doLogin('admin', 'KpS9EjNz16JtPmoe', postLogin); // postLogin function gets a call once request is completed  function postLogin(result, args) {     if(!result) alert('Login failed');     else invokeMethod(); } function invokeMethod() {     client.doInvoke(postInvoke, 'custom_wsmethod',     { 'firstparam' : 'F', 'secondparam' : 'S' } );      // postInvoke gets a call once request is completed } function postInvoke(result, args) {     if(result == false) {         alert(client.lastError()['message']);     } else {         // Process result     } } &lt;/script&gt; </pre>



lastError()	
Parameters	
Callback First parameter	Map containing (code, message) if the last operation failed or else false
Details	
Example	<pre> &lt;script type='text/javascript'&gt; var url = 'http://en.vtiger.com/wip'; var client = new Vtiger_WSCClient(url);  client.doLogin('admin', 'Kps9EjNz16JtPmoe', postLogin); // postLogin function gets a call once request is completed  function postLogin(result, args) {     if(!result) alert('Login failed');     else execQuery(); } function execQuery() {     var query = "SELECT * FROM Accounts WRONGQUERY";      client.doQuery(query, postExecQuery);      // postExecQuery gets a call once request is completed } function postExecQuery(result, args) {     if(!result) {         var wasError = client.lastError();         alert('ERROR CODE: ' + wasError['code'] + ', MESSAGE: ' + wasError['message']);     } } &lt;/script&gt; </pre>
NOTE	The lastError information is reset after every operation is executed.

<b>Object toJSON(inputString)</b>	
Parameters	inputString – json format input string
Return value	Javascript Array or Map or String
Details	Converts the given input JSON format string to Javascript Object
Example	<pre> &lt;script type='text/javascript'&gt; var url = 'http://en.vtiger.com/wip'; var client = new Vtiger_WSCClient(url);  var jsobj = client.toJSON( '{ "A" : "B" }' ); &lt;/script&gt; </pre>
<b>String toJSONString(input)</b>	
Parameters	input – Javascript Array or Map or String
Return value	JSON string
Details	Converts the given input to JSON format string
Example	<pre> &lt;script type='text/javascript'&gt; var url = 'http://en.vtiger.com/wip'; var client = new Vtiger_WSCClient(url);  var jsonstring = client.toJSONString( { 'a'=&gt;'ValueA' } ); &lt;/script&gt; </pre>

## Python Client Library Overview

Python Client wrapper (vtiger\_WSCClient) provides the following functions:

- doLogin
- doListTypes
- doDescribe
- doCreate
- doRetrieve
- doQuery
- doInvoke
- lastError
- toJSON
- toJSONString

### Class overview

class Vtiger\_WSCClient is defined in the file vtwsclib/Vtiger/WSCClient.py

<b>Vtiger_WSCClient(url)</b>	
Parameters	url – vtiger CRM URL
Return value	Instantiates class object
Example	<pre>import sys # Absolute/Relative path of vtwsclib/Vtiger folder sys.path.append('vtwsclib/Vtiger')  from WSCClient import *  # Create Vtiger webservice client client = Vtiger_WSCClient('http://en.vtiger.com/wip')</pre>

Object <b>doLogin</b> (username, accesskey)	
Parameters	username – vtiger CRM username accesskey – users unique key (See My Preferences in vtiger CRM as shown <a href="#">here</a> )
Return value	True – on success False – on failure
Details	Initializes Vtiger_WSClient with sessionId on successful login which is required for performing other operations. Function referenced via callback will be invoked.
Example	<pre> import sys # Absolute/Relative path of vtwsclib/Vtiger folder sys.path.append('vtwsclib/Vtiger')  from WSClient import *  # Create Vtiger webservice client client = Vtiger_WSClient('http://en.vtiger.com/wip')  login = client.doLogin('admin', 'Kps9EjNz16JtPmoe')  if login:     print 'Login Successful' else:     print 'Login Failed!' </pre>

Object <code>doListTypes()</code>	
Parameters	
Return value	Module information accessible to logged in user.
Details	
Example	<pre> import sys # Absolute/Relative path of vtwsclib/Vtiger folder sys.path.append('vtwsclib/Vtiger')  from WSClient import *  # Create Vtiger webservice client client = Vtiger_WSClient('http://en.vtiger.com/wip')  login = client.doLogin('admin', 'Kps9EjNz16JtPmoe')  if not login:     print 'Login Failed!' else:     result = client.doListTypes()     for modulekey in result:         print 'Module Name: ', result[modulekey]['name'] </pre>

Object <b>doDescribe</b> (module)	
Parameters	module – module name
Return value	Details of the module as Map
Details	Information about fields of the module, permission to create, delete, update records of the module can be obtained.
Example	<pre> import sys # Absolute/Relative path of vtwscLib/Vtiger folder sys.path.append('vtwscLib/Vtiger')  from WSCClient import *  # Create Vtiger webservice client client = Vtiger_WSCClient('http://en.vtiger.com/wip')  login = client.doLogin('admin', 'Kps9EjNz16JtPmoe')  if not login:     print 'Login Failed!' else:     moduleInfo = client.doDescribe('Leads')     print 'ModuleInfo: ', moduleInfo </pre>

<b>Object doCreate(module, valuesmap)</b>	
Parameters	module – module name valuesmap – field name and field value pairs
Return value	On successful creation New record information will be returned back. Creation may fail if mandatory field name and value pair is not set.
Details	Creating new records in the module can be done using this method.
Example	<pre> import sys # Absolute/Relative path of vtwsclib/Vtiger folder sys.path.append('vtwsclib/Vtiger')  from WSClient import *  # Create Vtiger webservice client client = Vtiger_WSClient('http://en.vtiger.com/wip')  login = client.doLogin('admin', 'Kps9EjNz16JtPmoe')  if not login:     print 'Login Failed!' else:     recordInfo = client.doCreate('Leads',                                 { 'lastname' : 'CRMLead', 'company' : 'vtiger' })     print 'RecordId: ', client.getRecordId(recordInfo['id']) </pre>
NOTE:	The server returns record['id'] in the format <moduleid>'x'<recordid>. Use method getRecordId method can be used to retrieve only the record id part from the returned record id from the server.

Object <b>doRetrieve(record)</b>	
Parameters	record – identifier having the format <b>&lt;moduleid&gt;'x'&lt;recordid&gt;</b>
Return value	If specified module record is found its information is sent, otherwise False Creation may fail if mandatory field name and value pair is not set.
Details	Retrieve information of existing record of the module.
Example	<pre> import sys # Absolute/Relative path of vtwscLib/Vtiger folder sys.path.append('vtwscLib/Vtiger')  from WSCClient import *  # Create Vtiger webservice client client = Vtiger_WSCClient('http://en.vtiger.com/wip')  login = client.doLogin('admin', 'Kps9EjNz16JtPmoe')  if not login:     print 'Login Failed!' else:     # Fetch contact record with id 110     record = '4x110'     recordInfo = client.doRetrieve(record)     print 'RecordId: ', client.getRecordId(recordInfo['id']) </pre>



<b>Object doQuery(query)</b>	
Parameters	query – SELECT query to use for fetching the records.
Return value	Result sent from the server.
Details	Webservices provides custom subset of SQL support to work with vtiger CRM.
Example	<pre> import sys # Absolute/Relative path of vtwsclib/Vtiger folder sys.path.append('vtwsclib/Vtiger')  from wsClient import *  # Create Vtiger webservice client client = Vtiger_wsClient('http://en.vtiger.com/wip')  login = client.doLogin('admin', 'Kps9EjNz16JtPmoe')  if not login:     print 'Login Failed!' else:     # Search for Accounts with name like 'vtiger'     query = "SELECT * FROM Accounts WHERE accountname LIKE '%vtiger%'"     result = client.doQuery(query)     if(result):         columns = client.getResultColumns(result)         print 'Columns: ', columns         print 'Result : ', result </pre>
NOTE:	<p>Use getResultColumns API to retrieve column names available in the result records.</p> <p>Please refer the webservises documentation to know more about SQL format and support.</p>

Object <b>doInvoke</b> (method, params, type)	
Parameters	method – Name of the webservice method to invoke params – Parameters to the webservice method type – POST/GET transport type to use to invoke the method
Return value	Result sent from the server.
Details	This method provides the ability to invoke the custom webservice method that is exposed by REST interface.
Example	<pre> import sys # Absolute/Relative path of vtwsclib/Vtiger folder sys.path.append('vtwsclib/Vtiger')  from WSCClient import *  # Create Vtiger webservice client client = Vtiger_WSCClient('http://en.vtiger.com/wip')  login = client.doLogin('admin', 'Kps9EjNz16JtPmoe')  if not login:     print 'Login Failed!' else:     # Invoke custom method with parameters     result = client.doInvoke('custom_wsmethod', {'firstparam':'f', 'secondparam' : 's'} )     if(result):         # Process the result     else:         print 'ERROR: ', client.lastError(); </pre>

Object <code>lastError()</code>	
Parameters	
Return value	Map containing (code, message) if the last operation failed or else false
Details	
Example	<pre> import sys # Absolute/Relative path of vtwsclib/Vtiger folder sys.path.append('vtwsclib/Vtiger')  from WSClient import *  # Create Vtiger webservice client client = Vtiger_WSClient('http://en.vtiger.com/wip')  login = client.doLogin('admin', 'Kps9EjNz16JtPmoe')  if not login:     print 'Login Failed!' else:     # Search for Accounts with name like 'vtiger'     query = "SELECT * FROM Accounts WHERE WRONGQUERY"     result = client.doQuery(query)     if(result):         columns = client.getResultColumns(result)         print 'Columns: ', columns         print 'Result : ', result     else:         errorInfo = client.lastError()         print 'Error Code: ', errorInfo['code']         print 'Message   : ', errorInfo['message'] </pre>
NOTE:	The lastError information is reset after every operation is executed.

<b>Object toJSON(inputString)</b>	
Parameters	inputString – json format input string
Return value	Python Array or Map or String
Details	Converts the given input JSON format string to Python Object
Example	<pre>import sys # Absolute/Relative path of vtwsclib/Vtiger folder sys.path.append('vtwsclib/Vtiger')  from WSClient import *  # Create Vtiger webservice client client = Vtiger_WSClient('http://en.vtiger.com/wip')  pyobj = client.toJSON( '{ "A" : "B" }' );</pre>
<b>String toJSONString(input)</b>	
Parameters	input – Python Array or Map or String
Return value	JSON string
Details	Converts the given input to JSON format string
Example	<pre>import sys # Absolute/Relative path of vtwsclib/Vtiger folder sys.path.append('vtwsclib/Vtiger')  from WSClient import *  # Create Vtiger webservice client client = Vtiger_WSClient('http://en.vtiger.com/wip')  jsonstring = client.toJSONString( { 'a'=&gt;'valueA' } );</pre>

## Java Client Library Overview

Java Client wrapper (com.vtiger.vtwsclib.WSClient) provides the following functions:

- doLogin
- doListTypes
- doDescribe
- doCreate
- doRetrieve
- doQuery
- doInvoke
- lastError
- toJSON
- toJSONString

## Third-Party Libraries

- Make sure to have vtwsclib/java and vtwsclib/java/deps on the CLASSPATH when invoking through java command line.
- vtwsclib.jar depends on [HTTP Components](#) library which are bundled under vtwsclib/java/deps ([Apache License 2.0](#))
- vtwsclib.jar is bundled with [json-simple](#) library which can be re-used for JSON manipulation in your application. ([Apache License 2.0](#))

## Class overview

Class com.vtiger.vtwsclib.WSClient is defined in the core library class which is packaged in the java/vtwsclib.jar

WSClient(url)	
Parameters	url – vtiger CRM URL
Return value	Instantiates class object
Example	<pre>import com.vtiger.vtwsclib.WSClient;  /* Create vtiger webservice client */ WSClient client = new WSClient("http://en.vtiger.com/wip");</pre>

<b>boolean doLogin(String username, String accesskey)</b>	
Parameters	username – vtiger CRM username accesskey – users unique key (See My Preferences in vtiger CRM as shown <a href="#">here</a> )
Return value	True – on success False – on failure
Details	Initializes Vtiger_WSClient with sessionId on successful login which is required for performing other operations. Function referenced via callback will be invoked.
Example	<pre>import com.vtiger.vtwsclib.WSClient;  /* Create Vtiger webservice client */ WSClient client = new WSClient("http://en.vtiger.com/wip");  boolean result = client.doLogin("admin", "kpS9EjNz16JtPmoe");  if(result == false) {     System.out.println("Login failed!");     System.out.println(client.lastError()); } else {     System.out.println("Logged in"); }</pre>

java.util.Map doListTypes()	
Parameters	
Return value	Module information accessible to logged in user.
Details	
Example	<pre> import java.util.Iterator; import java.util.Map;  import com.vtiger.vtwsclib.WSClient;  /* Create Vtiger webservice client */ WSClient client = new WSClient("http://en.vtiger.com/wip");  boolean result = client.doLogin("admin", "KpS9EjNz16JtPmoe");  if(result == false) {     System.out.println("Login failed!");     System.out.println(client.lastError()); } else {     Map types = client.doListTypes();     Iterator iterator = types.keySet().iterator();     while(iterator.hasNext()) {         Object key = iterator.next();         Map moduleInfo = (Map) types.get(key);         System.out.println("Module name: " +             moduleInfo.get("name"));     } } </pre>

<b>org.json.simple.JSONObject doDescribe(String module)</b>	
Parameters	module – module name
Return value	Details of the module as Map
Details	Information about fields of the module, permission to create, delete, update records of the module can be obtained.
Example	<pre> import org.json.simple.JSONObject;  import com.vtiger.vtwsclib.WSClient;  /* Create Vtiger webservice client */ WSClient client = new WSClient("http://en.vtiger.com/wip");  boolean result = client.doLogin("admin", "Kps9EjNz16JtPmoe");  if(result == false) {     System.out.println("Login failed!");     System.out.println(client.lastError()); } else {     JSONObject describeResult = client.doDescribe("Leads");      if(client.hasError(describeResult)) {         System.out.println("Describe failed!" +             client.lastError());     } else {         System.out.println(describeResult);     } } </pre>



<b>org.json.simple.JSONObject doCreate(String module, java.util.Map valuesmap)</b>	
Parameters	module – module name valuesmap – field name and field value pairs
Return value	On successful creation New record information will be returned back. Creation may fail if mandatory field name and value pair is not set.
Details	Creating new records in the module can be done using this method.
Example	<pre> import java.util.HashMap; import java.util.Map; import org.json.simple.JSONObject;  import com.vtiger.vtwsclib.WSClient;  /* Create Vtiger webservice client */ WSClient client = new WSClient("http://en.vtiger.com/wip");  boolean result = client.doLogin("admin", "Kps9EjNz16JtPmoe");  if(result == false) {     System.out.println("Login failed!");     System.out.println(client.lastError()); } else {     Map valuesmap = new HashMap();     valuesmap.put("lastname", "Test Lastname");     valuesmap.put("company", "Test Company");      JSONObject createResult = client.doCreate(         "Leads", valuesmap);     if(client.hasError(createResult)) {         System.out.println("Create failed!" +             client.lastError());     } else {         System.out.println(createResult);     } } </pre>
NOTE:	The server returns record['id'] in the format <moduleid>'x'<recordid>. Use method WSClient.getRecordId method can be used to retrieve only the record id part from the returned record id from the server.

<b>org.json.simple.JSONObject doRetrieve(Object record)</b>	
Parameters	record – identifier having the format <b>&lt;moduleid&gt;'x'&lt;recordid&gt;</b>
Return value	If specified module record is found its information is sent, otherwise False Creation may fail if mandatory field name and value pair is not set.
Details	Retrieve information of existing record of the module.
Example	<pre> import org.json.simple.JSONObject;  import com.vtiger.vtwsclib.WSClient;  /* Create Vtiger webservice client */ WSClient client = new WSClient("http://en.vtiger.com/wip");  boolean result = client.doLogin("admin", "Kps9EjNz16JtPmoe");  if(result == false) {     System.out.println("Login failed!");     System.out.println(client.lastError()); } else {     /* Fetch contact record with id 110 */     JSONObject retrieveInfo = client.doRetrieve("4x110");      if(client.hasError(retrieveInfo)) {         System.out.println("Retrieve failed!" +             client.lastError());     } else {         System.out.println(retrieveInfo);     } } </pre>

<b>org.json.simple.JSONArray doquery(String query)</b>	
Parameters	query – SELECT query to use for fetching the records.
Return value	Result sent from the server.
Details	Webservices provides custom subset of SQL support to work with vtiger CRM.
Example	<pre> import java.util.Iterator;  import org.json.simple.JSONArray; import org.json.simple.JSONObject;  import com.vtiger.vtwsclib.WSClient;  /* Create Vtiger webservice client */ WSClient client = new WSClient("http://en.vtiger.com/wip");  boolean result = client.doLogin("admin", "KpS9EjNz16JtPmoe");  if(result == false) {     System.out.println("Login failed!");     System.out.println(client.lastError()); } else {      JSONArray queryResult = client.doQuery("SELECT * FROM Leads");     if(client.hasError(queryResult)) {         System.out.println("Query failed!" + client.lastError());     } else {         System.out.println("# Result Rows " + queryResult.size());          System.out.println("# " + client.getResultColumns(queryResult));          Iterator resultIterator = queryResult.iterator();         while (resultIterator.hasNext()) {             JSONObject row = (JSONObject) resultIterator.next();             Iterator rowIterator = row.keySet().iterator();              System.out.println("---");             while (rowIterator.hasNext()) {                 Object key = rowIterator.next();                 Object val = row.get(key);                 System.out.println(" " + key + " : " + val);             }         }     } } </pre>
NOTE:	<p>Use getResultColumns API to retrieve column names available in the result records.</p> <p>Please refer the webservices documentation to know more about SQL format and support.</p>

Object <b>doInvoke</b> (String method, Object params) – type defaults to GET Object <b>doInvoke</b> (String method, Object params, String type)	
Parameters	method – Name of the webservice method to invoke params – Parameters to the webservice method type – POST/GET transport type to use to invoke the method
Return value	Result sent from the server.
Details	This method provides the ability to invoke the custom webservice method that is exposed by REST interface.
Example	<pre> import java.util.HashMap; import java.util.Map;  import com.vtiger.vtwsclib.WSClient;  /* Create Vtiger webservice client */ WSClient client = new WSClient("http://en.vtiger.com/wip");  boolean result = client.doLogin("admin", "Kps9EjNz16JtPmoe");  if(result == false) {     System.out.println("Login failed!");     System.out.println(client.lastError()); } else {      // Delete Leads module record with id = 179     Map params = new HashMap();     params.put("id", "2x179");      Object deleteResult = client.doInvoke("delete", params, "POST");      if (client.hasError(deleteResult)) {         System.out.println("Deletion failed!" + client.lastError());     } else {         System.out.println("Result " + deleteResult);     } } </pre>

Object <code>lastError()</code>	
Parameters	
Return value	JSON Map containing (code, message) if the last operation failed or Exception that happened while executing the operation.
Details	
Example	<pre> import org.json.simple.JSONArray; import org.json.simple.JSONObject;  import com.vtiger.vtwsclib.WSClient;  /* Create Vtiger webservice client */ WSClient client = new WSClient("http://en.vtiger.com/wip");  boolean result = client.doLogin("admin", "Kps9EjNz16JtPmoe");  if(result == false) {     System.out.println("Login failed!");     System.out.println(client.lastError()); } else {     JSONArray queryResult = client.doQuery("Wrong Query");     if(client.hasError(queryResult)) {         Object errorInstance = client.lastError();          if(errorInstance instanceof JSONObject) {             String code = ((JSONObject)errorInstance).get("code").toString();             String message = ((JSONObject)errorInstance).get("message").toString();              System.out.println("CODE: " + code + ", MESSAGE: " + message);         }     } } </pre>

<b>Object toJSON(String inputString)</b>	
Parameters	inputString – json format input string
Return value	org.json.simple.JSONArray or org.json.simple.JSONObject
Details	Converts the given input JSON format string to JSON Java Object
Example	<pre>import com.vtiger.vtwsclib.WSClient;  /* Create Vtiger webservice client */ WSClient client = new WSClient("http://en.vtiger.com/wip");  Object jsonObj = client.toJSON( "{ \"A\" : \"B\" }");</pre>
<b>String toJSONString(Object input)</b>	
Parameters	input – Java JSON Array or Map or String
Return value	JSON string
Details	Converts the given input to JSON format string
Example	<pre>import java.util.HashMap; import java.util.Map;  import com.vtiger.vtwsclib.WSClient;  /* Create Vtiger webservice client */ WSClient client = new WSClient("http://en.vtiger.com/wip");  Map map = new HashMap(); map.put("A", "b");  String jsonString = client.toJSONString(map);</pre>

## Appendix – I : API Changes

### doListTypes

version 1.1: List of module names was returned

```
[ 'Module1', 'Module2', ...]
```

version 1.2: Module information is returned as Map

```
{
  'Module1' : { 'name' : MODULENAME },
  'Module2' : { 'name' : MODULENAME }
}
```

## Appendix – II: Java library dependency

vtwsclib java library is packaged in vtwsclib.jar and depends on HTTP Components Client library.

The Class-Path in the MANIFEST file is configured to lookup the deps directory in the same folder where vtwsclib.jar resides.

```
java -cp your_class_path;../wip/vtwsclib/dist/vtwsclib.jar your.package.className
```

If you experience the run-time exception like:

```
Exception in thread "main" java.lang.NoClassDefFoundError: org/apache/http/impl/
client/DefaultHttpClient
    at java.lang.ClassLoader.defineClass1(Native Method)
    at java.lang.ClassLoader.defineClass(Unknown Source)
    at java.security.SecureClassLoader.defineClass(Unknown Source)
    at java.net.URLClassLoader.defineClass(Unknown Source)
    at java.net.URLClassLoader.access$100(Unknown Source)
    at java.net.URLClassLoader$1.run(Unknown Source)
    at java.security.AccessController.doPrivileged(Native Method)
    at java.net.URLClassLoader.findClass(Unknown Source)
    at java.lang.ClassLoader.loadClass(Unknown Source)
    at sun.misc.Launcher$AppClassLoader.loadClass(Unknown Source)
    at java.lang.ClassLoader.loadClass(Unknown Source)
    at java.lang.ClassLoader.loadClassInternal(Unknown Source)
    at com.vtiger.vtwsclib.WSClient.<init>(WSClient.java:53)
    at com.vtiger.tests.vtwsclib.TestWSClient.main(TestWSClient.java:20)
```

Please make review your CLASSPATH settings.