Reports WebData - GraphQL and MCP Client

New API modes and verbs on WebData for 10.1.5: GraphQL endpoint consumption, MCP client sessions, and the full REST verb set.

Reference **Modules** **Reports** **UI** **WebData** GraphQL and MCP Client

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New in 10.1.5. The **API** dropdown on the WebData grid adds GraphQL and McpHttp alongside REST, and REST gains PUT, PATCH, and DELETE verbs. Existing solutions open with `API=REST` and unchanged behavior.

A WebData row now represents one of three protocols: REST (the default), GraphQL, or an MCP server over HTTP. The protocol is set by the **API** column on the grid. Each mode exposes its own script methods. Calling a method from the wrong mode throws `InvalidOperationException`, so miswiring surfaces immediately at design and test time.

For base WebData configuration (Name, Encoding, DefaultURL, Authorization, Headers, Editor, File Operations, Padding), see Reports WebData Reference.

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API Dropdown Values

Value	Use when	Script methods
REST	You consume or expose a REST API.	`GetRequestAsync`, `PostRequestAsync`, `PutRequestAsync`, `PatchRequestAsync`, `DeleteRequestAsync`. From FrameworX 10.1.6a, for SPARQL 1.1 endpoints: `SparqlQueryAsync()`, `SparqlQueryAsync(query)`, `SparqlQueryTableAsync()`, `SparqlQueryTableAsync(query)`, `SparqlUpdateAsync()`, `SparqlUpdateAsync(update)`. Without an argument they send the Editor body with `{Tag.Name}` references filled in. `SparqlQueryTableAsync` returns a DataTable: SELECT and ASK results as rows and columns, CONSTRUCT and DESCRIBE results as one row per triple, read from Turtle, N-Triples, JSON-LD or RDF/JSON. See Reports WebData - SPARQL and Graph Databases.
GraphQL	You consume a GraphQL endpoint.	`QueryAsync()`, `QueryAsync(variablesJson)`.
McpHttp	You consume an MCP server over HTTP (tool discovery and tool calls).	`ListToolsAsync`, `CallAsync()`, `CallAsync(argumentsJson)`.

Mode guard: invoking a GraphQL or MCP method on a REST row, or any cross-mode combination, throws `InvalidOperationException` with the offending method name and the actual row mode.

REST Verbs (PUT, PATCH, DELETE)

In addition to the existing `GetRequestAsync` and `PostRequestAsync`, three new verb methods are available on REST rows.

PUT

Replace a resource with the Editor body.

```
await @Report.WebData.API.PutRequestAsync();
```

PATCH

Apply a partial update to a resource.

```
await @Report.WebData.API.PatchRequestAsync();
```

DELETE

Remove a resource.

```
await @Report.WebData.API.DeleteRequestAsync();
```

All three respect the row's Authorization, Headers, and Editor body exactly like POST. Response handling is identical to the existing verbs (see Reports WebData Reference).

GraphQL

Set **API** to `GraphQL`. The query text lives in the WebData Editor body. Variables are authored in the Editor and overridden at runtime when needed.

```
// Run the Editor query unchanged
string json = await @Report.WebData.GraphAPI.QueryAsync();

// Override variables at runtime
string variables = "{ \"plantId\": \"Plant1\", \"limit\": 25 }";
string json2 = await @Report.WebData.GraphAPI.QueryAsync(variables);

// Inspect the response
@Tag.GraphResponse = json2;
```

A GraphQL response with `errors[]` at HTTP 200 is returned as-is. Your script decides how to react. HTTP-level failures (non-2xx) surface as exceptions identical to REST.

GraphQL OperationName

The WebData row carries an `OperationName` column alongside `ToolName`. When set, the runtime wires it into the JSON-RPC envelope as `{query, variables, operationName}`. When null or empty, no `operationName` is sent and the server picks a default (or errors out if the query document declares more than one named operation).

Set `OperationName` when the query document defines multiple named operations and you need to pick one. A single-operation document does not need it.

The field appears on the WebData grid editor in Designer and on the Data Explorer WebData Tools Reference tab in the Export path. `{{Tag.*}}` tokens in `OperationName` resolve at runtime like any other string property.

Schema migration `2020.1.10` adds the column. Solutions opened in 10.1.5 gain the column automatically. 10.1.4 builds do not see this field.

MCP Client (HTTP)

Set **API** to `McpHttp`. The row represents an MCP client session. Configure the server URL in **DefaultURL**. The runtime opens the session on first call, reuses it for five minutes of idle time, and closes it on runtime stop or after the idle window.

```
// Discover available tools
string toolsJson = await @Report.WebData.McpServer.ListToolsAsync();
@Tag.AvailableTools = toolsJson;

// Call a tool with the Editor-body arguments
string result1 = await @Report.WebData.McpServer.CallAsync();

// Override arguments at runtime
string args = "{ \"target\": \"Plant1/Tank1\", \"mode\": \"read\" }";
string result2 = await @Report.WebData.McpServer.CallAsync(args);
```

A server returning HTTP 404 triggers automatic session re-init and one retry. Any other HTTP error surfaces as an exception. The session is disposed on `OnStop` of the Report runtime, so no background HTTP state survives across runtime restarts.

The MCP client speaks streamable-HTTP with JSON-RPC 2.0 framing. Authorization and Headers on the WebData row flow into every request, so bearer tokens and custom headers work exactly like REST.

MCP Session Handshake

Before the first `tools/list` or `tools/call`, the runtime performs the MCP `2025-03-26` handshake against the server URL:

- Send a JSON-RPC `initialize` request declaring client capabilities and protocol version.
- Capture the `Mcp-Session-Id` value from the response headers and retain it for the life of the session.
- POST a `notifications/initialized` message to acknowledge the handshake.
- Attach the `Mcp-Session-Id` header to every subsequent request. An expired session returns HTTP 404, which triggers automatic re-initialization and one retry of the original call.

See also: WebData Tools Reference — `MCP Session Handshake`. The Data Explorer tester uses the same handshake, so behavior stays symmetric between the runtime `ReportWebData` path and the design-time tester.

Migration

Existing WebData rows open with `API=REST` and unchanged behavior. No property-level migration is required. Setting the API value to GraphQL or McpHttp is a one-click change on the grid.

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