

# REST

## *Find, Get, List, Save, Update, Delete*

Version 1.2.2-SNAPSHOT, 2025-09-13T18:01:35Z

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Quantum provides consistent REST resources backed by repositories. Extend BaseResource to expose CRUD quickly and consistently.

# Chapter 1. Base Concepts

- `BaseResource<T, R extends Repo<T>>` provides endpoints for:
- `find`: query by criteria (filters, pagination)
- `get`: fetch by id or refName
- `list`: list all within scope with paging
- `save`: create
- `update`: modify existing
- `delete`: delete or soft-delete/archival depending on model
- `UIActionList`: derive available actions based on current model state.
- DataDomain filtering is applied across all operations to enforce multi-tenancy.

## Chapter 2. Example Resource

```
import com.e2eq.framework.rest.resources.BaseResource;
import jakarta.ws.rs.Path;

@Path("/products")
public class ProductResource extends BaseResource<Product, ProductRepo> {
}
```

# Chapter 3. Authorization Layers in REST CRUD

Quantum combines static, identity-based checks with dynamic, domain-aware policy evaluation. In practice you will often use both:

## 1) Hard-coded permissions via annotations

- Use standard Jakarta annotations like `@RolesAllowed` (or the framework's `@RoleAllow` if present) on resource classes or methods to declare role-based checks that must pass before executing an endpoint.
- These checks are fast and decisive. They rely on the caller's roles as established by the current `SecurityIdentity`.

Example:

```
import jakarta.annotation.security.RolesAllowed;

@RolesAllowed({"ADMIN", "CATALOG_EDITOR"})
@Path("/products")
public class ProductResource extends BaseResource<Product, ProductRepo> {
    // Only ADMIN or CATALOG_EDITOR can access all inherited CRUD endpoints
}
```

## 2) JWT groups and role mapping

- When using the JWT provider, the token's groups/roles claims are mapped into the Quarkus `SecurityIdentity` (see the Authentication guide).
- Groups in JWT typically become roles on `SecurityIdentity`; these roles are what `@RolesAllowed/@RoleAllow` checks evaluate.
- You can augment or transform roles using a `SecurityIdentityAugmentor` (see `RolesAugmentor` in the framework) to add derived roles based on claims or external lookups.

## 3) RuleContext layered authorization (dynamic policies)

- After annotation checks pass, `RuleContext` evaluates domain-aware permissions. This layer can:
- Enforce `DataDomain` scoping (tenant/org/owner)
- Allow cross-tenant reads for specific functional areas when policy permits
- Contribute query predicates and projections to repositories
- Think of `@RolesAllowed/@RoleAllow` as the coarse-grained gate, and `RuleContext` as the fine-grained, context-sensitive policy engine.

## 4) Quarkus `SecurityIdentity` and `SecurityFilter`

- Quarkus produces a `SecurityIdentity` for each request containing principal name and roles.

- The framework's `SecurityFilter` inspects the incoming request (e.g., JWT) and populates/augments the `SecurityIdentity` and the derived `DomainContext` used by `RuleContext` and repositories.
- `BaseResource` and underlying repos (e.g., `MorphiaRepo`) consume `SecurityIdentity/DomainContext` to apply permissions and filters consistently.

For detailed rule-base matching (URL, headers, body predicates, priorities), see the [Permissions](#) section.

# Chapter 4. Querying

- Use query parameters or a request body (depending on your API convention) to express filters.
- RuleContext contributes tenant-aware filters and projections automatically.



# Chapter 5. Responses and Schemas

- Models are returned with calculated fields (e.g., `actionList`) when appropriate.
- OpenAPI annotations in your models/resources integrate with MicroProfile OpenAPI for schema docs.

# Chapter 6. Error Handling

- Validation errors (e.g., `ImportRequiredField`, `Size`) return helpful messages.
- Rule-based denials return appropriate HTTP statuses (403/404) without leaking cross-tenant metadata.

# Chapter 7. Query Language (ANTLR-based)

The find/list endpoints accept a filter string parsed by an ANTLR grammar (BIAPIQuery.g4). Use the filter query parameter to express predicates; combine them with logical operators and grouping. Sorting and projection are separate query parameters.

- Operators:
- Equals: '='
- Not equals: '!='
- Less than/Greater than: '<' / '>'
- Less-than-or-equal/Greater-than-or-equal: '<=' / '>='
- Exists (field present): '~' (no value)
- In list: '^' followed by [v1,v2,...]
- Boolean literals: true/false
- Null literal: null
- Logical:
- AND: '&&'
- OR: '|' | '|'
- NOT: '!' (applies to a single allowed expression)
- Grouping: parentheses '(' and ')'
- Values by type:
- Strings: unquoted or quoted with "..."; quotes allow spaces and punctuation
- Whole numbers: prefix with '#' (e.g., #10)
- Decimals: prefix with '.' (e.g., 19.99)
- Date: yyyy-MM-dd (e.g., 2025-09-10)
- DateTime (ISO-8601): 2025-09-10T12:30:00Z (timezone supported)
- ObjectId (Mongo 24-hex): 5f1e9b9c8a0b0c0d1e2f3a4b
- Reference by ObjectId: @@5f1e9b9c8a0b0c0d1e2f3a4b
- Variables:  
\${ownerId|principalId|resourceId|action|functionalDomain|pTenantId|pAccountId|rTenantId|rAccountId|realm|area}

## 7.1. Simple filters (equals)

```
# string equality
name:"Acme Widget"
# whole number
quantity:#10
```

```
# decimal number
price:##19.99
# date and datetime
shipDate:2025-09-12
updatedAt:2025-09-12T10:15:00Z
# boolean
active:true
# null checks
description:null
# field exists
lastLogin:~
# object id equality
id:5f1e9b9c8a0b0c0d1e2f3a4b
# variable usage (e.g., tenant scoping)
dataDomain.tenantId:${pTenantId}
```

## 7.2. Advanced filters: grouping and AND/OR/NOT

```
# Products that are active and (name contains widget OR gizmo), excluding discontinued
active:true && (name:*widget* || name:*gizmo*) && status:! "DISCONTINUED"

# Shipments updated after a date AND (destination NY OR CA)
updatedAt:>=2025-09-01 && (destination:"NY" || destination:"CA")

# NOT example: items where category is not null and not (price < 10)
category:!null && !(price:<##10)
```

Notes: - Wildcard matching uses **:** **name:\*widget** (prefix/suffix/contains). **'?** matches a single character. - Use parentheses to enforce precedence; otherwise AND/OR follow standard left-to-right with explicit operators.

## 7.3. IN lists

```
status:^[ "OPEN", "CLOSED", "ON_HOLD" ]
ownerId:^[ "u1", "u2", "u3" ]
referenceId:^[ @5f1e9b9c8a0b0c0d1e2f3a4b, @6a7b8c9d0e1f2a3b4c5d6e7f ]
```

## 7.4. Sorting

Provide a sort query parameter (comma-separated fields): - '-' prefix = descending, '+' or no prefix = ascending.

Examples:

```
# single field descending
```

```
?sort=-createdAt
```

```
# multiple fields: createdAt desc, refName asc  
?sort=-createdAt,refName
```

## 7.5. Projections

Limit returned fields with the projection parameter (comma-separated): - '+' prefix = include, '-' prefix = exclude.

Examples:

```
# include only id and refName, exclude heavy fields  
?projection=+id,+refName,-auditInfo,-persistentEvents
```

## 7.6. End-to-end examples

- GET `/products/list?skip=0&limit=50&filter=active:true&&name:*widget*&sort=-updatedAt&projection=+id,+name,-auditInfo`
- GET `/shipments/list?filter=(destination:"NY" | |destination:"CA")&&updatedAt:>=2025-09-01&sort=origin`

These features integrate with RuleContext and DataDomain: your filter runs within the tenant/org scope derived from the security context; RuleContext may add further predicates or projections automatically.

# Chapter 8. CSV Export and Import

These endpoints are inherited by every resource that extends BaseResource. They are mounted under the resource's base path. For example, PolicyResource at /security/permission/policies exposes:

GET /security/permission/policies/csv	-	POST /security/permission/policies/csv	-	POST /security/permission/policies/csv/session	-	POST /security/permission/policies/csv/session/{sessionId}/commit	-	DELETE /security/permission/policies/csv/session/{sessionId}	-	GET /security/permission/policies/csv/session/{sessionId}/rows
---------------------------------------	---	--	---	--	---	---	---	--	---	--

Authorization and scoping: - All CSV endpoints are protected by the same @RolesAllowed("user", "admin") checks as other CRUD operations. - RuleContext filters and DataDomain scoping apply the same way as list/find; exports stream only what the caller may see, and imports are saved under the same permissions. - In multi-realm deployments, include your X-Realm header as you do for CRUD; underlying repos resolve realm and domain context consistently.

## 8.1. Export: GET /csv

Produces a streamed CSV download of the current resource collection.

Query parameters and behavior: - fieldSeparator (default ",") - Single character used to separate fields. Typical values: , ; \t - requestedColumns (default refName) - Comma-separated list of model field names to include, in output order. If omitted, BaseResource defaults to refName. - Nested list extraction is supported with the [0] notation on a single nested property across all requested columns (e.g., addresses[0].city, addresses[0].zip). Indices other than [0] are rejected. If the nested list has multiple items, multiple rows are emitted per record (one per list element), preserving other column values. - quotingStrategy (default QUOTE\_WHERE\_ESSENTIAL) - QUOTE\_WHERE\_ESSENTIAL: quote only when needed (when a value contains the separator or quoteChar). - QUOTE\_ALL\_COLUMNS: quote every column in every row. - quoteChar (default ") - The character used to surround quoted values. - decimalSeparator (default .) - Reserved for decimal formatting. Note: current implementation ignores this value; decimals are rendered using the locale-independent dot. - charsetEncoding (default UTF-8-without-BOM) - One of: US-ASCII, UTF-8-without-BOM, UTF-8-with-BOM, UTF-16-with-BOM, UTF-16BE, UTF-16LE. - "with-BOM" values write a Byte Order Mark at the beginning of the file (UTF-8: EF BB BF; UTF-16: FE FF). - filter (optional) - ANTLR DSL filter applied server-side before streaming (see Query Language section). Reduces rows and can improve performance. - filename (default downloaded.csv) - Suggested download filename returned via Content-Disposition header. - offset (default 0) - Zero-based index of the first record to stream. - length (default 1000, use -1 for all) - Maximum number of records to stream from offset. Use -1 to stream all (be mindful of client memory/time). - prependHeaderRow (optional boolean, default false) - When true, the first row contains column headers. Requires requestedColumns to be set (the default refName satisfies this requirement). - preferredColumnNames (optional list) - Overrides header names positionally when prependHeaderRow=true. The list length must be ≤ requestedColumns; an empty string entry means "use default field name" for that column.

Response: - 200 OK with Content-Type: text/csv and Content-Disposition: attachment; filename="...". - On validation/processing errors, the response status is 400/500 and the body contains a single text line describing the problem (e.g., "Incorrect information supplied: ..."). Unrecognized query

parameters are rejected with 400.

Examples:

- Export selected fields with header, custom filename and filter

```
curl -H "Authorization: Bearer $JWT" \  
      -H "X-Realm: system-com" \  
  
"https://host/api/products/csv?requestedColumns=id,refName,price&prependHeaderRow=true  
&filename=products.csv&filter=active:true&sort=+refName"
```

- Export nested list's first element across columns

```
# emits one row per address entry when more than one is present  
curl -H "Authorization: Bearer $JWT" \  
  
"https://host/api/customers/csv?requestedColumns=refName,addresses[0].city,addresses[0]  
].zip&prependHeaderRow=true"
```

## 8.2. Import: POST /csv (multipart)

Consumes a CSV file (multipart/form-data) and imports records in batches. The form field name for the file is file.

Query parameters and behavior: - `fieldSeparator` (default ",") - Single character expected between fields. - `quotingStrategy` (default `QUOTE_WHERE_ESSENTIAL`) - Same values as export; controls how embedded quotes are recognized. - `quoteChar` (default ") - The expected quote character in the file. - `skipHeaderRow` (default true) - When true, the first row is treated as a header and skipped. Mapping is positional, not by header names. - `charsetEncoding` (default UTF-8-without-BOM) - The file encoding. "with-BOM" variants allow consuming a BOM at the start. - `requestedColumns` (required) - Comma-separated list of model field names in the same order as the CSV columns. This positional mapping drives parsing and validation. Nested list syntax `[0]` is allowed with the same constraints as export.

Behavior: - Each row is parsed into a model instance using type-aware processors (ints, longs, decimals, enums, etc.). - Bean Validation is applied; rows with violations are collected as errors and not saved; valid rows are batched and saved. - For each saved batch, insert vs update is determined by `refName` presence in the repository. - Response entity includes counts (`importedCount`, `failedCount`) and per-row results when available. - Response headers: - `X-Import-Success-Count`: number of rows successfully imported. - `X-Import-Failed-Count`: number of rows that failed validation or DB write. - `X-Import-Message`: summary message.

Example (direct import):

```
curl -X POST \  
      -H "Authorization: Bearer $JWT" \  
      -F "file=@products.csv"
```

```
-H "X-Realm: system-com" \  
-F "file=@policies.csv" \
```

```
"https://host/api/security/permission/policies/csv?requestedColumns=refName,principalId,description&skipHeaderRow=true&fieldSeparator=,&quoteChar=\"&quotingStrategy=QUOTE_WHERE_ESSENTIAL&charsetEncoding=UTF-8-without-BOM"
```

## 8.3. Import with preview sessions

Use a two-step flow to analyze first, then commit only valid rows.

- POST /csv/session (multipart): analyzes the file and creates a session
- Same parameters as POST /csv (fieldSeparator, quotingStrategy, quoteChar, skipHeaderRow, charsetEncoding, requestedColumns).
- Returns a preview ImportResult including sessionId, totals (totalRows, validRows, errorRows), and row-level findings. No data is saved yet.
- POST /csv/session/{sessionId}/commit: imports only error-free rows from the analyzed session
- Returns CommitResult with inserted/updated counts.
- DELETE /csv/session/{sessionId}: cancels and discards session state (idempotent; always returns 204).
- GET /csv/session/{sessionId}/rows: page through analyzed rows
- Query params:
- skip (default 0), limit (default 50)
- onlyErrors (default false): when true, returns only rows with errors
- intent (optional): filter rows by intended action: INSERT, UPDATE, or SKIP

Notes and constraints: - requestedColumns must reference actual model fields. Unknown fields or multiple different nested properties are rejected (only one nested property across requestedColumns is allowed when using [0]). - Unrecognized query parameters are rejected with HTTP 400 to prevent silent misconfiguration. - Very large exports should prefer streaming with sensible length settings or server-side filters to reduce memory and time. - Imports run under the same security rules as POST / (save). Ensure the caller has permission to create/update the target entities in the chosen realm.