



Here's the complete anatomy of the FastAPI route definition:

```
### **1. Decorator - `@app.get("/items/{item_id}")`**
```python
@app
 # The FastAPI application instance
 .get(# HTTP method decorator (GET, POST, etc.)
 "/items/{item_id}" # URL path with {path_parameter}
)
...

- **`@app`**: References your `app = FastAPI()` instance
- **`.get()`**: Specifies this handles HTTP GET requests
- **Path Components**:
 - `/items/` → Static path segment
 - `{item_id}` → Path parameter (variable part)

2. Function Definition - `def get_item(item_id: int) -> dict:`
```python
def
    # Standard Python function
    get_item      # Route handler name (can be any valid name)
    (item_id: int) # Path parameter with type hint
    -> dict:      # Return type annotation
...

- **Parameter**:
    - `item_id` must match the path parameter name
    - `: int` enforces integer type conversion/validation
- **Return Type**:
    - `-> dict` documents the response will be a dictionary

### **3. Docstring - `"""Demonstrates path parameter type conversion"""`**
```python
"""...""" # Triple-quoted documentation string
...

- Appears in:
 - OpenAPI/Swagger UI docs
 - Automatic API documentation
 - IDE tooltips

4. Function Body - `return {"item_id": item_id}`
```python
return
    # Standard Python return
    {"item_id": item_id} # Response body (auto-converted to JSON)
...

- FastAPI automatically:
    - Converts Python dict → JSON
    - Sets `Content-Type: application/json`
    - Includes the response in OpenAPI docs

### **Full Technical Flow**
1. **Request Comes In**: `GET /items/42`
2. **Path Parsing**:
    - Extracts `42` from URL
    - Converts to integer (because of `: int`)
    - Rejects non-integer requests with 422 error
3. **Function Execution**:
    - Calls `get_item(42)`
    - Processes return value
4. **Response Creation**:
    - Converts dict to JSON
    - Returns HTTP 200 with JSON body

### **Key Features Demonstrated**
- **Type Conversion**: URL string → Python int
- **Validation**: Rejects non-integer values
- **Documentation**: Shows in `/docs` with parameter types
- **Serialization**: Automatic dict-to-JSON conversion

### **Visualization in Swagger UI**
...

GET /items/{item_id}
Parameters:
  • item_id (integer) [required]
Responses:
  200: {"item_id": 0}
  422: Validation Error (if non-integer provided)
...

```

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Visualization in Swagger UI

GET /items/{item_id}

Parameters:

- `item_id` (integer) [required]

Responses:

200: {"item_id": 0}

422: Validation Error (if non-integer provided)