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REST

REpresentational State Transfer

- Uses **HTTP** protocol
- *Stateless* communication (no memory about prior requests)
- Scalable
- Resource is identified by **URL** e.g. `http://example.com/customers/1234`
- Data Exchange can use *text*, *XML*, *JSON*, *HTML*

Resource Linkage

Example: Order 1234: 23 products with id 44533 ordered by customer with id 4711

```
{
  "orderId":      1234,
  "amount":      23,
  "productRef":   "http://example.com/products/44533",
  "customerRef":  "http://example.com/customers/4711"
}
```

Standard Method Call Semantics

| method | path | body | semantics |
|--------|---------|-------------------------------------------|-------------------------------------------------|
| GET | order | | return all orders |
| GET | order/1 | | return order with ID 1 |
| POST | order | { "product": "milk", "amount": 2 } | create new order based on body data |
| PUT | order/1 | { "product": "milk", "amount": 13 } | update order with ID 1 based on body data |
| DELETE | order/1 | | delete order with ID 1 |

| method | path | body | semantics |
|--------|---------|------------------|-----------------------------------------------------|
| PATCH | order/1 | { "amount": 13 } | partially update order with ID 1 based on body data |

HTTP methods

- **GET**: retrieve information
- **POST**: submit data (often create resource)
- **PUT**: update resource
- **DELETE**: delete resource
- **PATCH**: partially update resource (only send changed parts)

Most Important Status Codes

- **100 range**: information
- **200 range**: indicates **success**
- **300 range**: redirects
- **400 range**: indicates **client error**
- **500 range**: indicates **server error**

| Error Code | Meaning |
|--------------|-----------------------|
| 200 | OK |
| 201 | Created |
| 204 | No Content |
| 400 | Bad Request |
| 401 | Unauthorized |
| 403 | Forbidden |
| 404 | Not Found |
| **409 | Conflict |
| 500 | Internal Server Error |
| 501 | Not Implemented |
| 503 | Service Unavailable |

Server Interface As Table

| operation | HTTP method | path | request body | reply body | status codes |
|-------------------------|-------------|-----------|--------------|------------|--------------|
| getOrder(int id): Order | GET | order/:id | | Order | 200, 404 |

| operation | HTTP method | path | request body | reply body | status codes |
|-------------------------------|----------------|-------|-----------------|------------|-----------------|
| createOrder(oOrder): Order | POST | order | Order | Order | 201 |