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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":<br>"milk", "amount":<br>2 }  | create new order<br>based on body<br>data       |
| PUT    | order/1 | { "product":<br>"milk", "amount":<br>13 } | update order<br>with ID 1 based<br>on body data |
| DELETE | order/1 |   | delete order with<br>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               |
|--------------|-----------------------|
| <b>200</b>   | <b>OK</b>             |
| <b>201</b>   | <b>Created</b>        |
| <b>204</b>   | <b>No Content</b>     |
| <b>400</b>   | <b>Bad Request</b>    |
| 401          | Unauthorized          |
| 403          | Forbidden             |
| <b>404</b>   | <b>Not Found</b>      |
| <b>**409</b> | <b>Conflict</b>       |
| 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<br>method | path  | request<br>body | reply body | status<br>codes |
|-----------------------------------|----------------|-------|-----------------|------------|-----------------|
| createOrder(o<br>Order):<br>Order | POST           | order | Order           | Order      | 201             |