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# REST

## REST Maturity Levels

These notes are combined from

- 1) V. Paliath
- 2) Rajendran, Doran, Balasubramanian  
Student presentation

# Richardson's Maturity Model for RESTful APIs

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Despite Fielding's Theory and the buzz it created, there were no reference models & coalescing of best practices for a while.

- Then about a half-dozen or so years later (2007-10) REST burst into the mainstream, and folks tried to better understand how to put it in practice

Richardson talked at QCon '08 about a Maturity Model for REST:

The evolution of API's/apps claiming to be REST:

Level 0: The Swamp of POX (Plain Old XML)

Level 1: Resources

Level 2: HTTP Verbs

Level 3: Hypermedia Controls (true RESTfulness)

<https://www.crummy.com/writing/speaking/2008-QCon/act3.html>

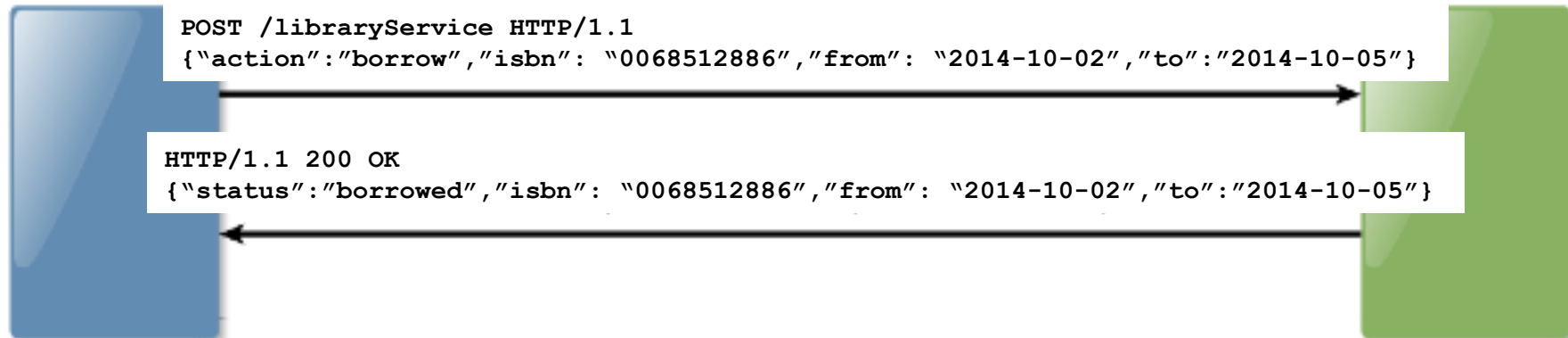
<https://martinfowler.com/articles/richardsonMaturityModel.html>

# Richardson's Maturity Model for RESTful APIs

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## Level 0: The Swamp of POX

- Endpoints are simply URLs that return XML (or JSON) – like our OMDb example.
- Requires published specification of all URIs.
- Media-type is usually not semantically appropriate.
- Representation does not contain links to other resources.
- Does not use HTTP verbs appropriately.
- Older API's (i.e., early 2000's looked like this)



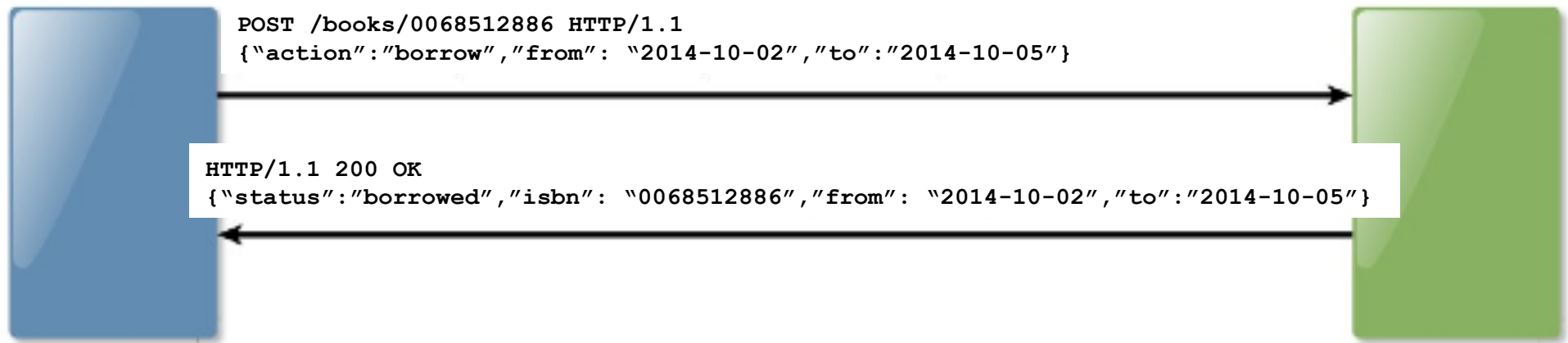
# Richardson's Maturity Model for RESTful APIs

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## Level 1: Resources

- Many URIs, one HTTP method
- Has URI representations for resources; like /person/{id}, etc.
- Still has a published specification for different resource URIs.
- Media-types are still not semantically appropriate.
- Still doesn't use HTTP verbs appropriately.
- Some API's that exist today look like this

*What is different in the exchange below?*

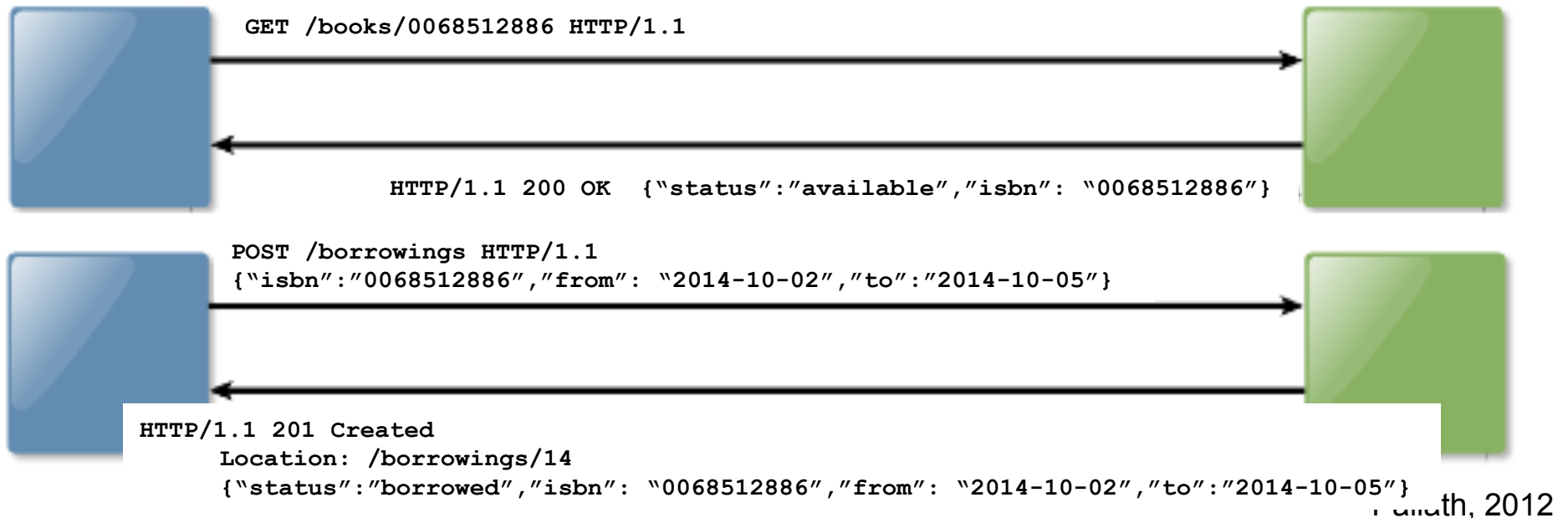


# Richardson's Maturity Model for RESTful APIs

## Level 2: HTTP Verbs

- Many URIs & endpoints. HTTP response codes semantically appropriate
- Uses appropriate HTTP verbs for operations: GET to retrieve information, PUT to replace, POST to create, PATCH to modify, DELETE to delete
- Still doesn't use semantically-appropriate media-types; returns XML/JSON
- Still has published specification.
- API's and applications are moving in this direction.

*Check out the different response code to the POST in the exchange below*



# Richardson's Maturity Model for RESTful APIs

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## Level 3: Hypermedia Controls

- We attained *true* RESTfulness.
- Returns semantically-appropriate media-types.
- Published specs for media-types and complex modeled-relationships.
- Does not need any published URIs other than one endpoint. That is, resources are *discoverable*.
- Truly adheres to HATEOAS. That is, uses hypermedia to transmit semantically-appropriate information including context of the information and what actions can be performed on this information.

# Level 3 Exchange



# Richardson's Maturity Model Summary

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- Purists still cite Richardson's Maturity Model as justification for what is "REST" and what is not
- As with other maturity models, it does not portend to suggest what is "right" for an organization, or provide a "better or worse" judgment
  - Like all software design decisions, what is "just good enough" usually wins (is most cost-effective).
  - Another way of stating this is, if you can be stable and serve all anticipated clients at a lower maturity level, is it really worth it to be more "RESTfully pure"?
- The model does remain an effective guide however for organizing the API design principles for REST.