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# ADO.NET DATA SERVICES

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# Agenda

- **Overview of ADO.NET Data Services**
- **Exposing Data Sources**
  - Custom data sources, LINQ to SQL, LINQ to Entities
- **Building Clients**
  - .NET Clients, AJAX based clients
- **More “advanced” topics**
  - Interception
  - Service Operations
  - Batching of operations
  - Dealing with concurrency

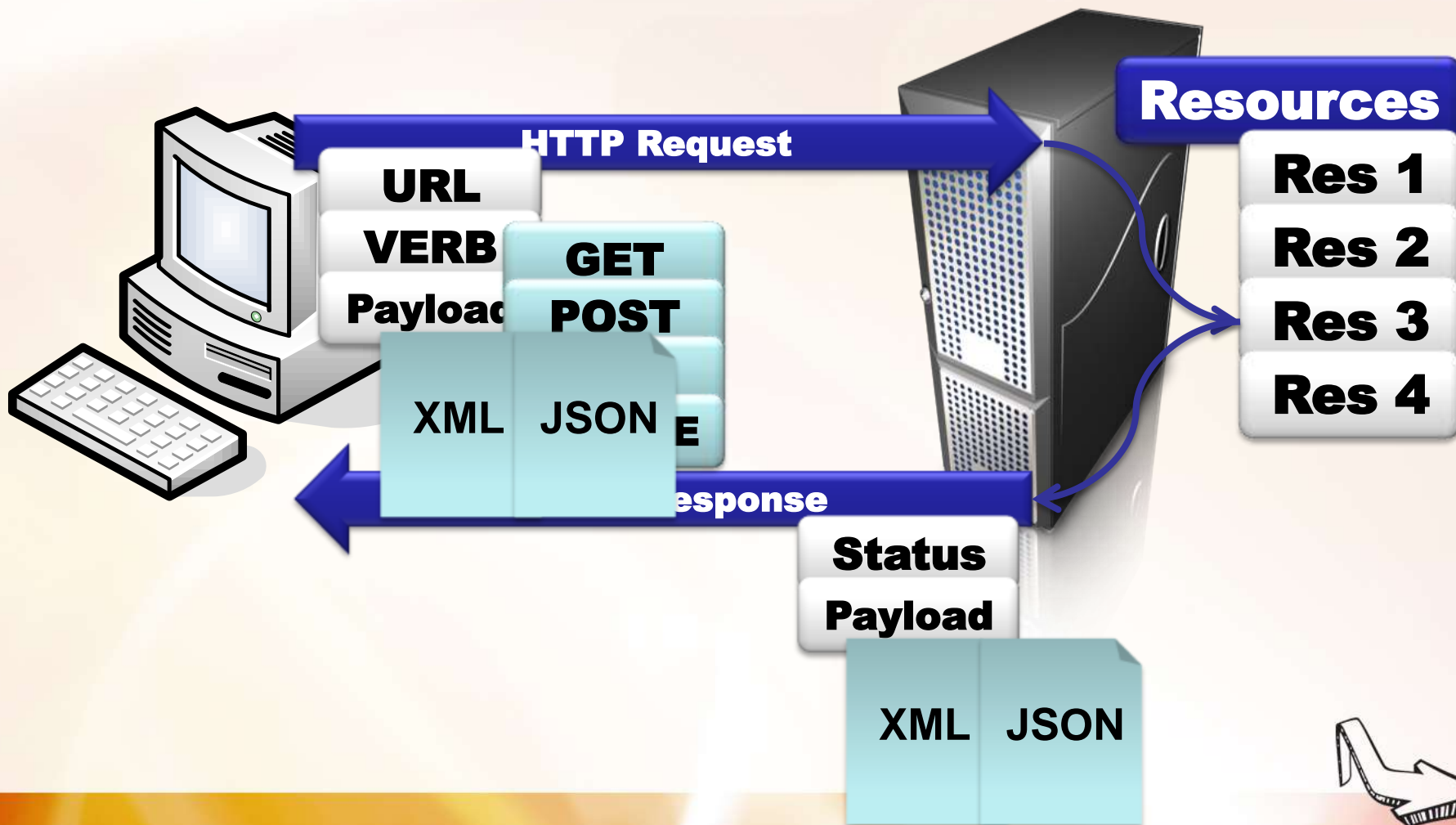


## Data Services – Overview

- **Builds on top of WCF V3.5**
- **Provides new functionality**
  - CRUD access to **data** over **RESTful** web services
  - Built-in URI-based query syntax
  - Client-side libraries for .NET, AJAX and Silverlight
- **Status**
  - In VS 2008 Service Pack 1, Ships Summer 2008
  - Current version is in Sp1 Beta 1 but has been through various previews



# RESTful Web Services?



# RESTful?

- **REpresentational State Transfer**
  - Server-side resources identified by a URI
  - Access is over HTTP, verb tied to action
    - **GET** to read the value of a resource
    - **POST** to create a new resource
    - **PUT** to update an existing resource
    - **DELETE** to delete a resource
  - Returned data is “plain” – XML or JSON
- **Is this “the death of SOAP”?**



## Data? What Kind of Data?

- Provide a **type** with public properties which are **IQueryable<T>**
  - Some rules about how **T** has to be formed
  - Remember the extension method **AsQueryable()**
- **Only get write access if your type implements IUpdatable**
- **Works well with generated code from;**
  - ADO.NET Entity Framework (**ObjectContext**)
  - LINQ to SQL (**DataContext\***)



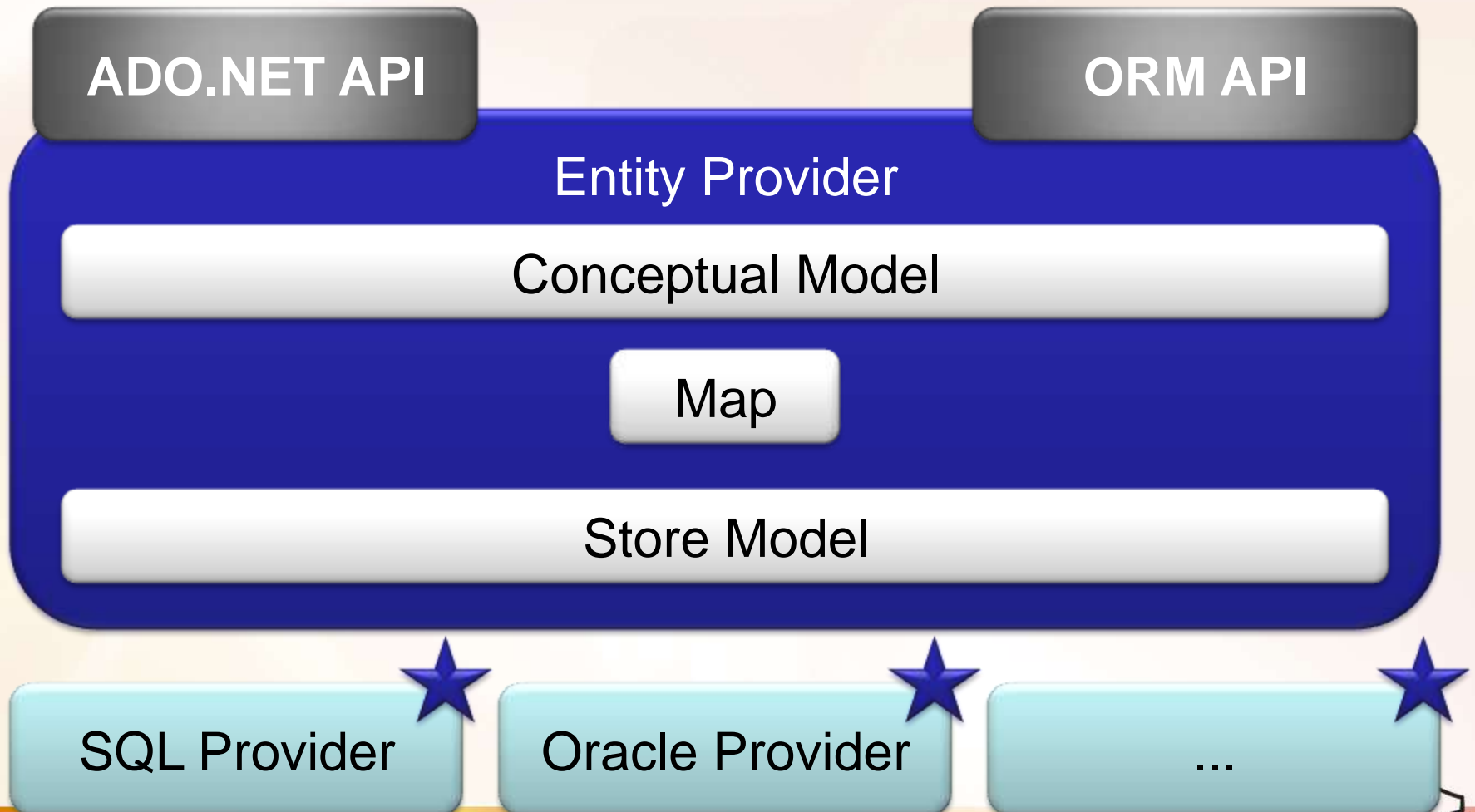
# DEMO

**Exposing Data with ADO.NET Data Services**





# ADO.NET Entity Framework????



# DEMO

**Exposing EF Data with ADO.NET Data Services**



# Querying with ADO.NET Data Services

- **URI based query mechanism**
  - <http://myservice.svc/MyEntitySet>
- **Supports the notion of navigating by primary key**
  - `MyEntitySet ( MyPrimaryKeyCol1, Col2, ... )`
- **Supports various operators**
  - `$orderby, $top, $skip, $expand, $filter, $value`



# Operators for \$filter

Logic	Arithmetic	String	Date/Time
eq	add	contains	second
ne	sub	endswith	hour
gt	mul	startswith	minute
gteq	div	length	day
lt	mod	indexof	month
lteq	round	insert	year
and	floor	remove x 2	
or	ceiling	replace	<b>Type</b>
not		substring	isof
		tolower	cast
		toupper	
		trim	
		concat	



# DEMO

Querying Data with the URI



# Building Clients

- **Services offer metadata**
  - `MyService.svc/$metadata`
- **.NET clients made easier through a proxy generation tool**
  - `datasvcutil.exe`
- **AJAX clients made easier through a script library**
  - Data Service AJAX Client Library
  - Available as a download on [Codeplex](#)



# DEMO

**Building .NET and AJAX clients**



# Interception & Operations

- **Possible to hook code into the dispatch mechanism**
- **For queries we can write**
  - Query interceptors
- **For modifications we can write**
  - Change interceptors
- **Can also expose custom functionality**
  - Service Operations
  - Useful for providing “canned” functionality, can be parameterised



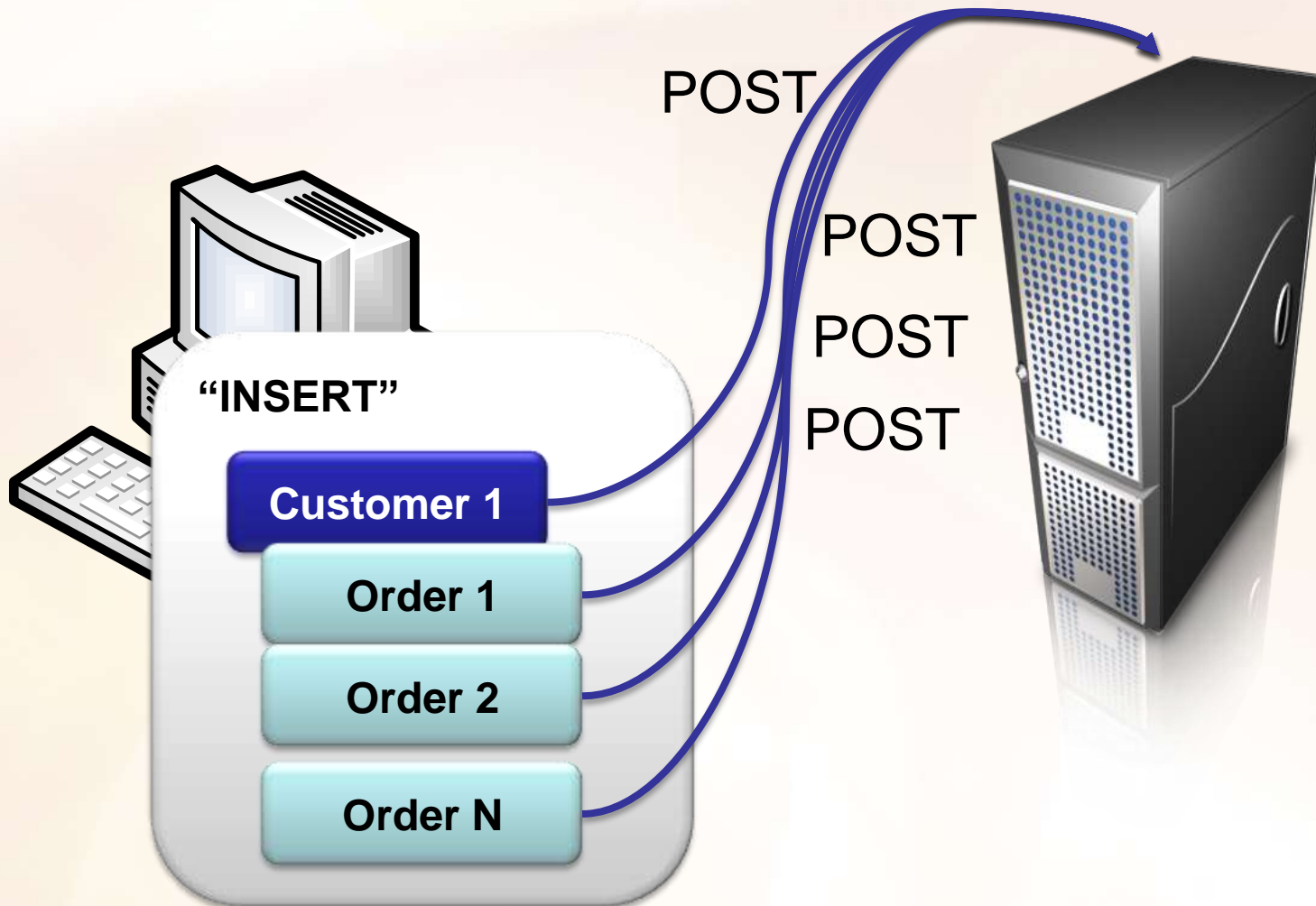


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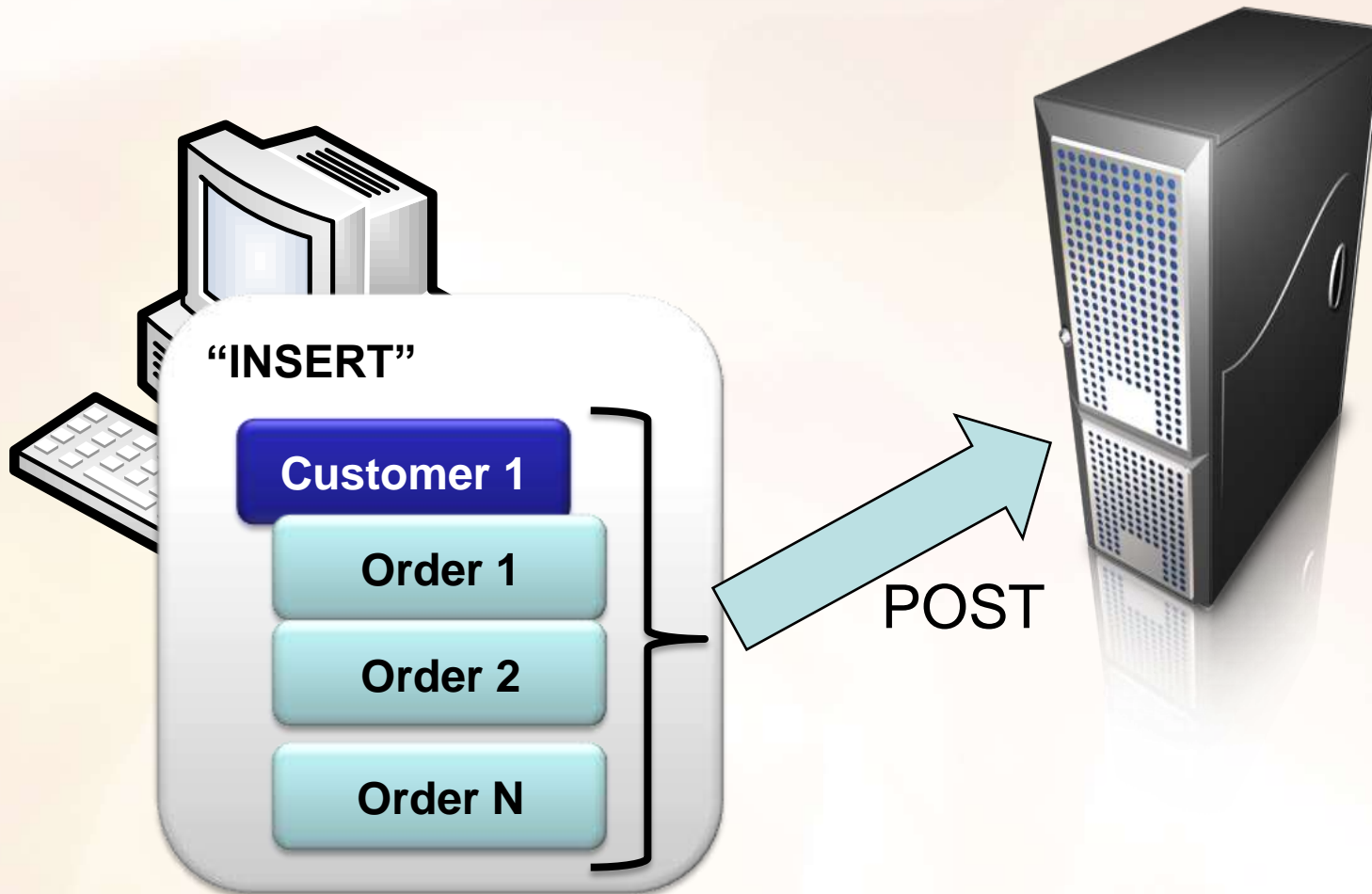
**Interception and Service Operations**



# Batching of Operations



# Batching of Operations



# Batching of Operations

- **Provides a mechanism to process a batch**
  - 0 or more Query operations
  - 0 or more [Create/Update/Delete] operations
- **Uses multipart/mixed MIME type sent to a \$batch endpoint**
- **Use**
  - `SaveChanges(SaveChangesOptions.Batch)`
  - `ExecuteBatch()`

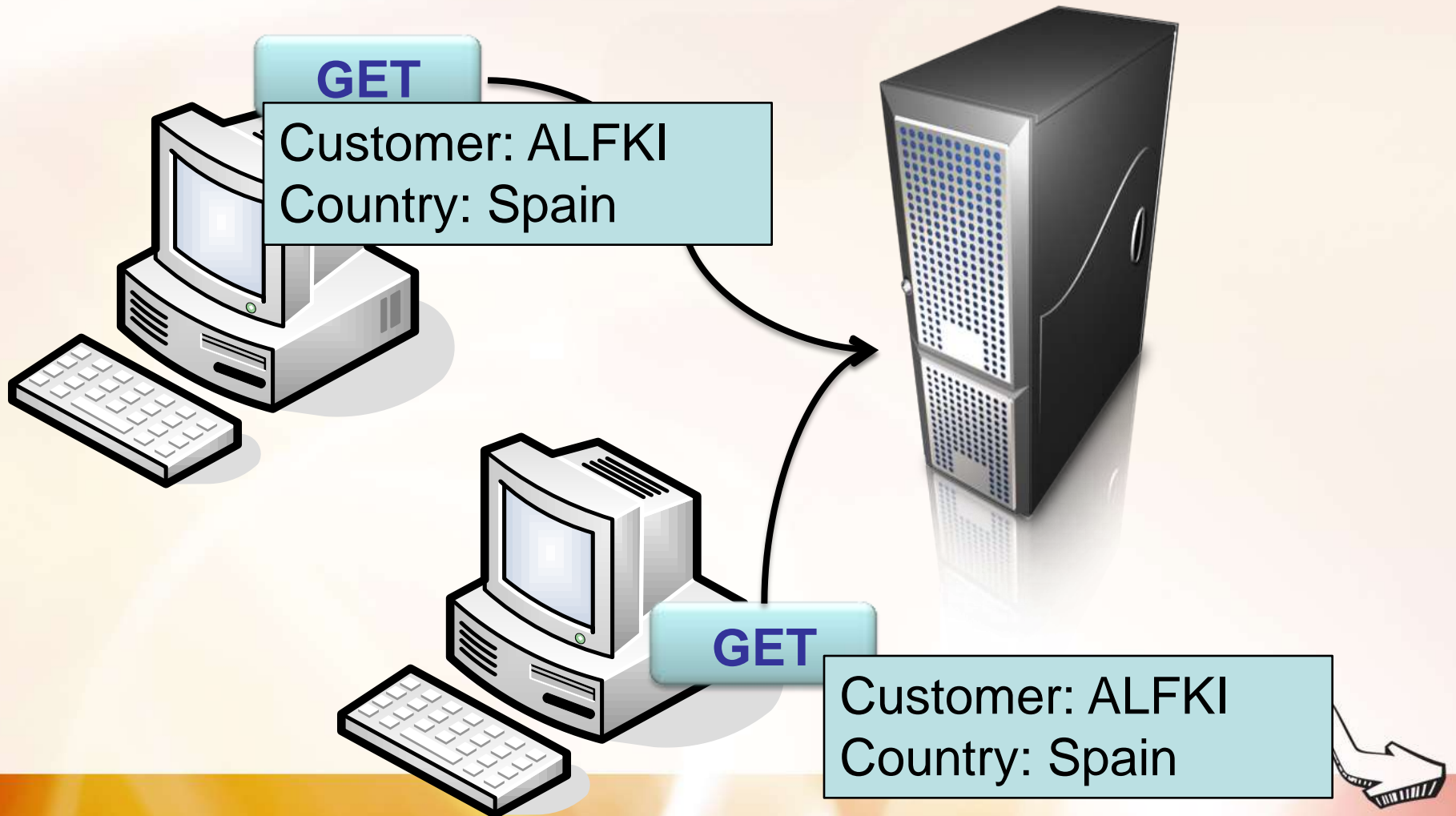


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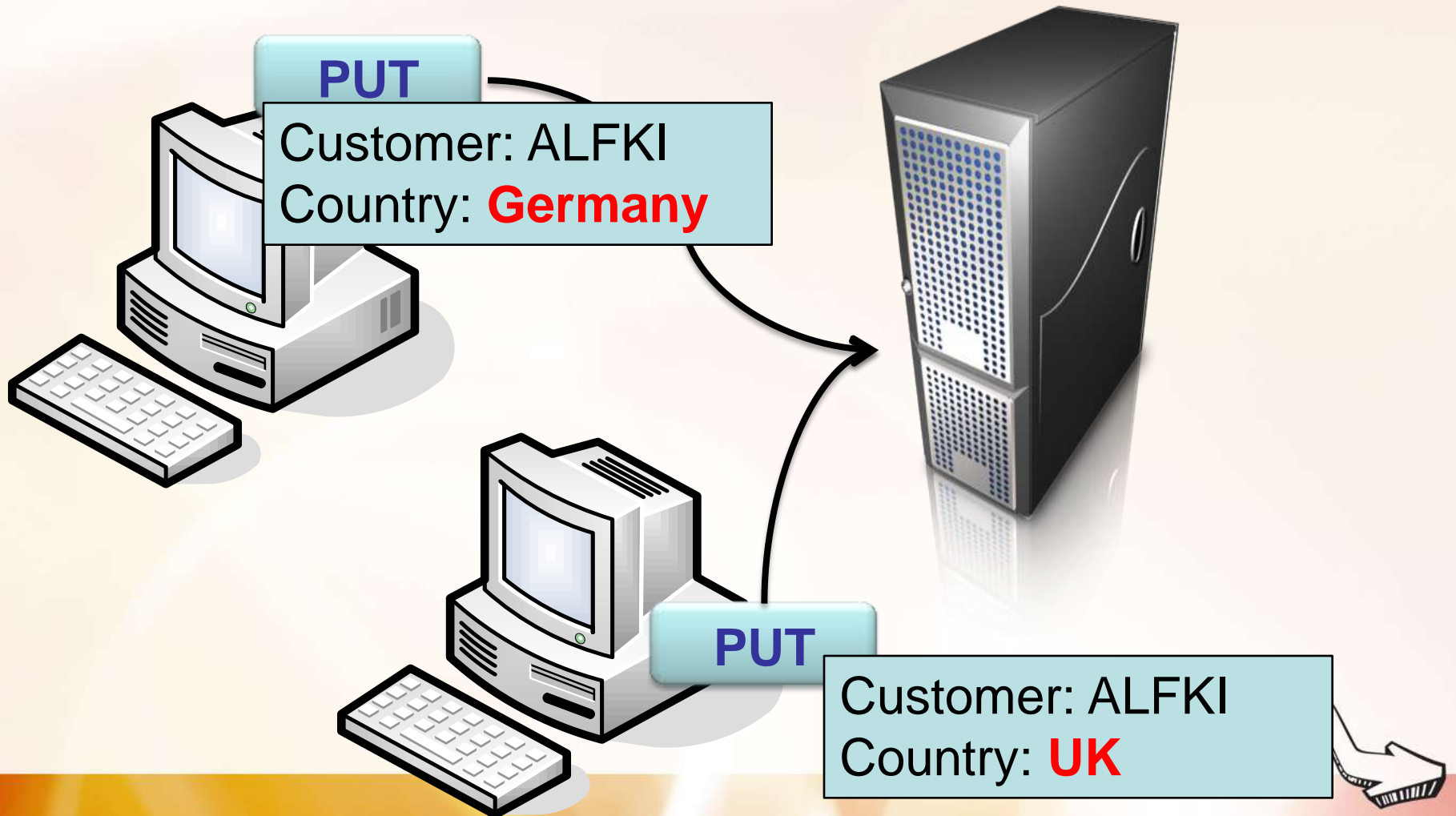
## Batching of Operations



# Managing Concurrency



# Managing Concurrency



# Managing Concurrency

- **Optim**

- **Attri**

- Not

- **Stand**

- eTag

- HTTP

occurs ( 412 returned for failure )

```
[DataServiceKey("Name")]
[ETag("FirstName", "LastName")]
public class SuperHero
{
    public string Name { get; set; }
    public string FirstName { get; set; }
    public string LastName { get; set; }
    public List<Enemy> Enemies { get; set; }
}
```





# DEMO

## Managing Concurrency



## Resources

- **New Data Developer Site**
  - <http://www.datadeveloper.net>
- **Data Services (“Astoria”) Team Blog**
  - <http://blogs.msdn.com/astoriateam>
- **My website** 😊
  - <http://www.miketaulty.com> ( search Data Services )



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