Clouded Sunday

Δημήτριος Χ. Μιχαλάκος

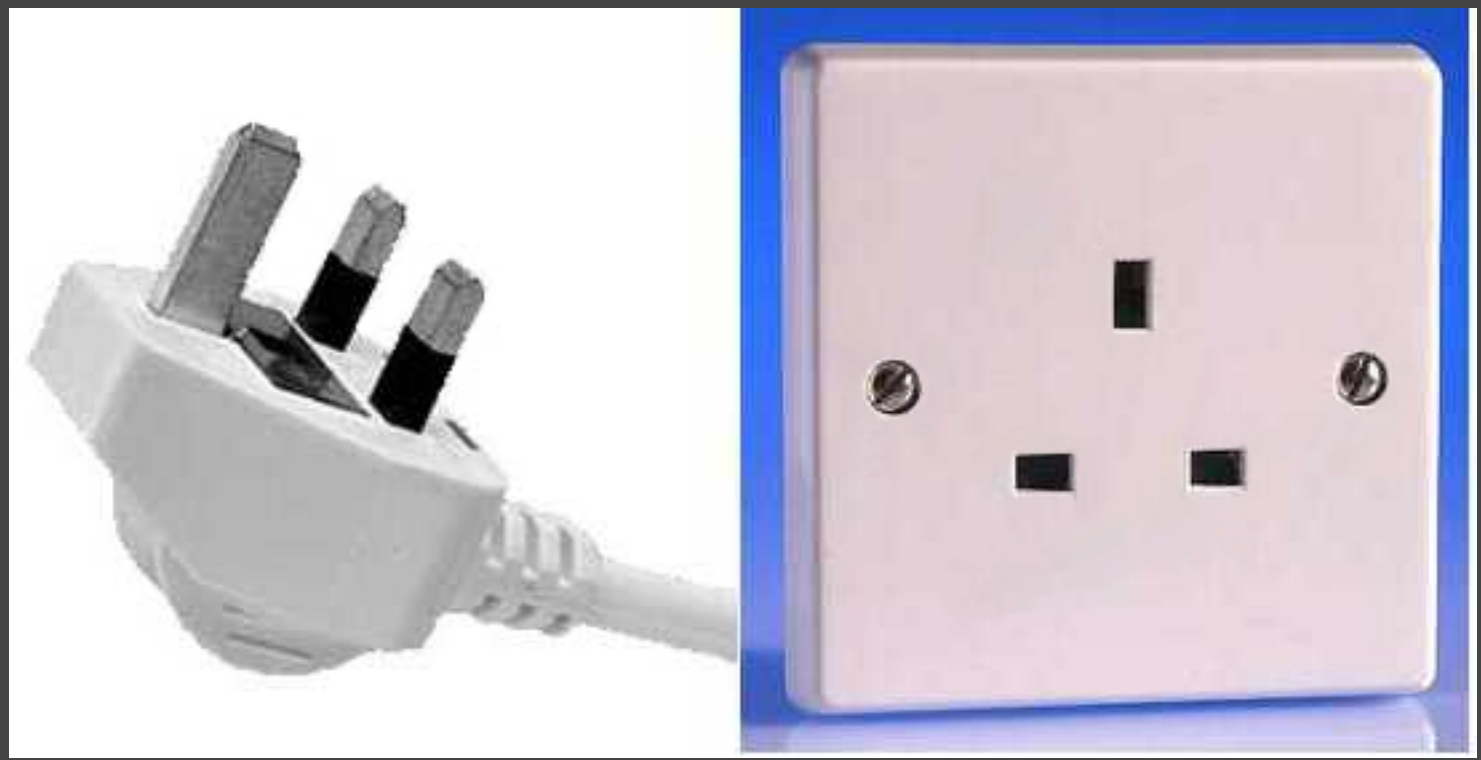
Συνέδριο Δημιουργών ΕΛ/ΛΑΚ 2009

Εισαγωγή

Europlug 2.5 A/250 V unearthed

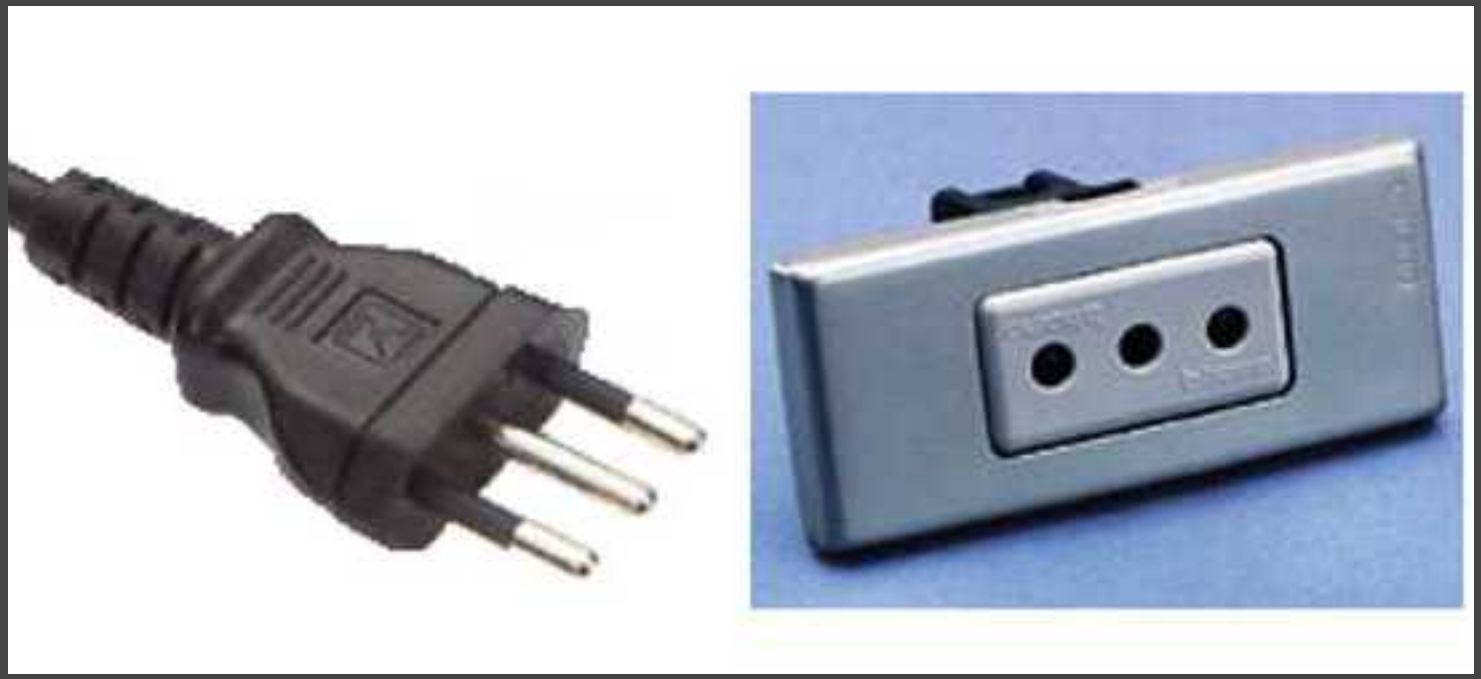
German "Schuko" 16 A/250 V earthed

Danish 10 A/250 V earthed



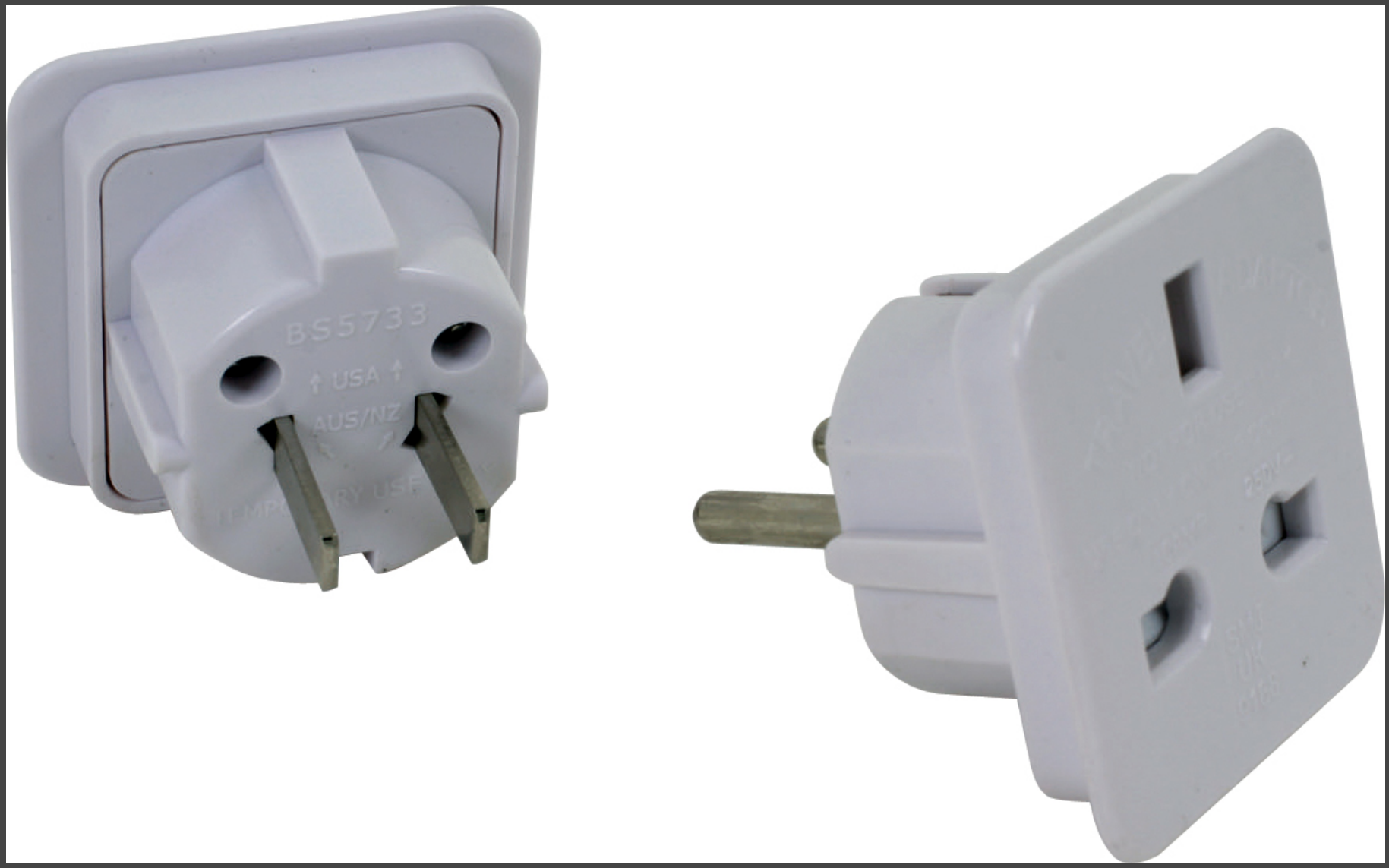
British 13 A/230-240 V 50 Hz earthed

North American 15 A/125 V unearthed



Italian 10 A/250 V earthed

Σύγχυσις (η): η πράξις και το αποτέλεσμα του συγχύζω, ανακάτεμα, μπέρδεμα.
π.χ. "σύγχυσις γλωσσών"



Λύση: Adaptor

Τα δεδομένα

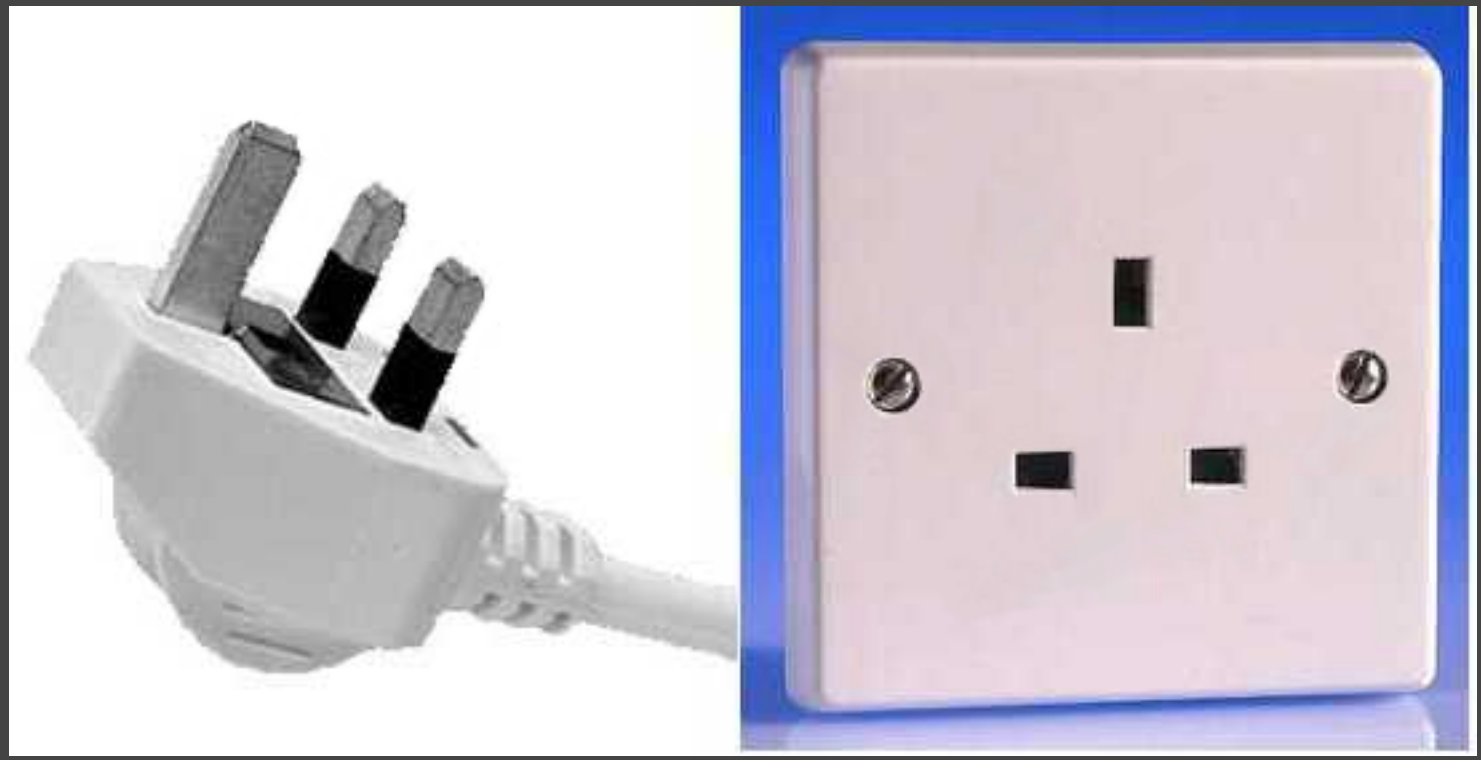
* πρωτόκολλα επικοινωνίας (API)

POP3

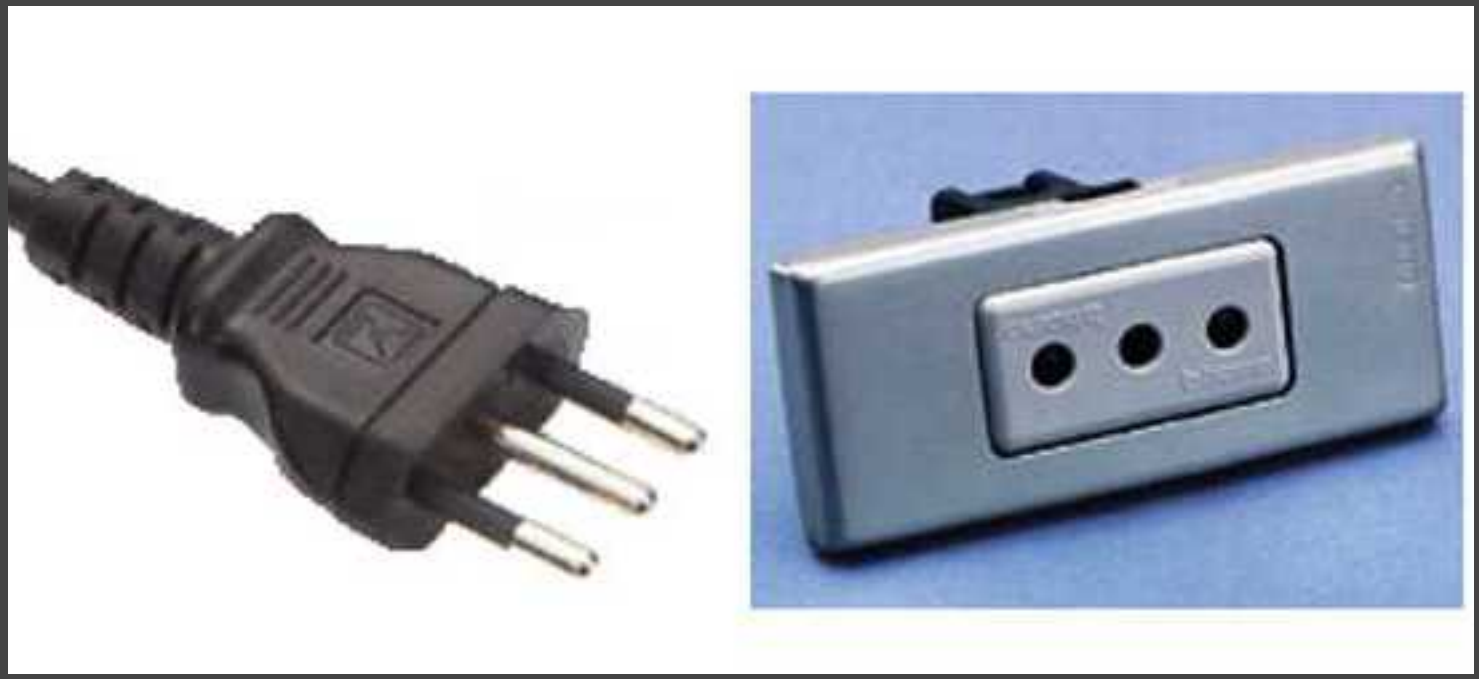
HTTP

Microsoft SQL Database

Sun MySQL Database



FTP



DNS

Το πρόβλημα

Σύγχυσις
Δυσκολία διαχείρισης

Το πρόβλημα από την οπτική του προγραμματιστή

- **Προγραμματιστής:** Σχεδιάζω και αναπτύσσω μία MySQL βάση δεδομένων. Πως θα δώσω πρόσβαση στον τελικό χρήστη;

- **Φωνή της συνείδησης:** Φτιάξε interface.

- **Προγραμματιστής:** Δεν έχω χρόνο για άλλο πόνο.

Το πρόβλημα από την οπτική του χρήστη

- **Χρήστης:** Μόλις αγόρασα ένα νέο laptop με Vista. Πως θα μπω μέσω FTP σε ένα repository για να κατεβάσω 2 αρχεία για την δουλειά μου.

- **Φωνή της συνείδησης:** Κατέβασε το Filezilla.

- **Χρήστης:** Είμαι άσχετος. Πως χειρίζομαι το Filezilla. Κάτι πιο εύκολο δεν υπάρχει;

Η λύση

A uniform interface

REST = HTTP + ROA = L.F.E.

HTTP

- GET
- DELETE
- PUT
- POST
- HEAD
- TRACE

ROA

Four (4) concepts:

1. Resources
2. Their names (URIs)
3. Their representations
4. The links between them

Popular RESTful Web Services

- Amazon S3
- Google
- Google maps
- Delicious
- Flickr
- Twitter
- Clouded Sunday :)

Clouded Sunday

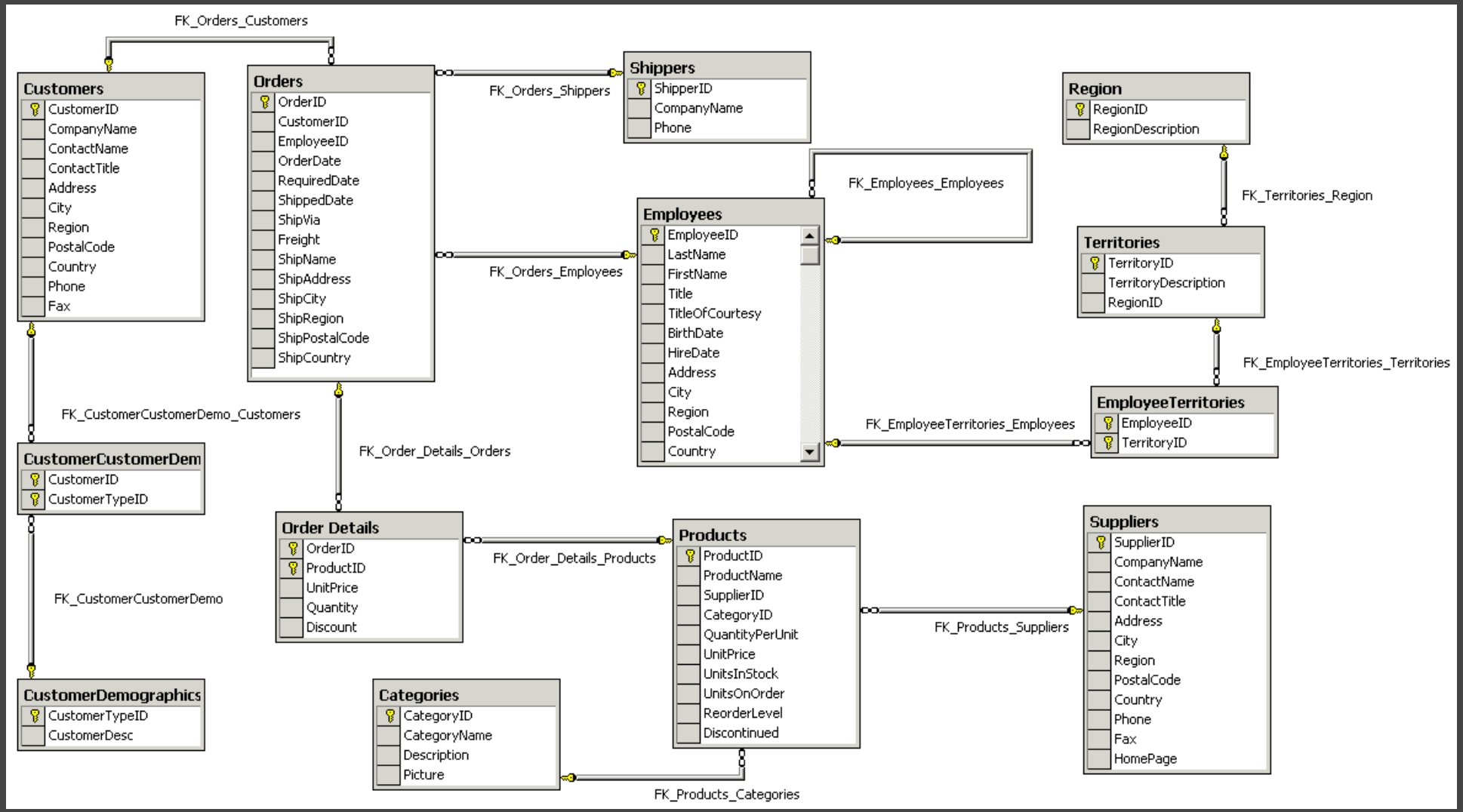
- Written in Java
- Dependencies: Jersey, Java Mail, JDBC drivers
- Licensed under GPL v2
- http://code.google.com/p/cloudedsunday

Restful SQL

SQL Commands		HTTP verbs
SELECT	→	GET
DELETE	→	DELETE
UPDATE	→	PUT
INSERT	→	POST

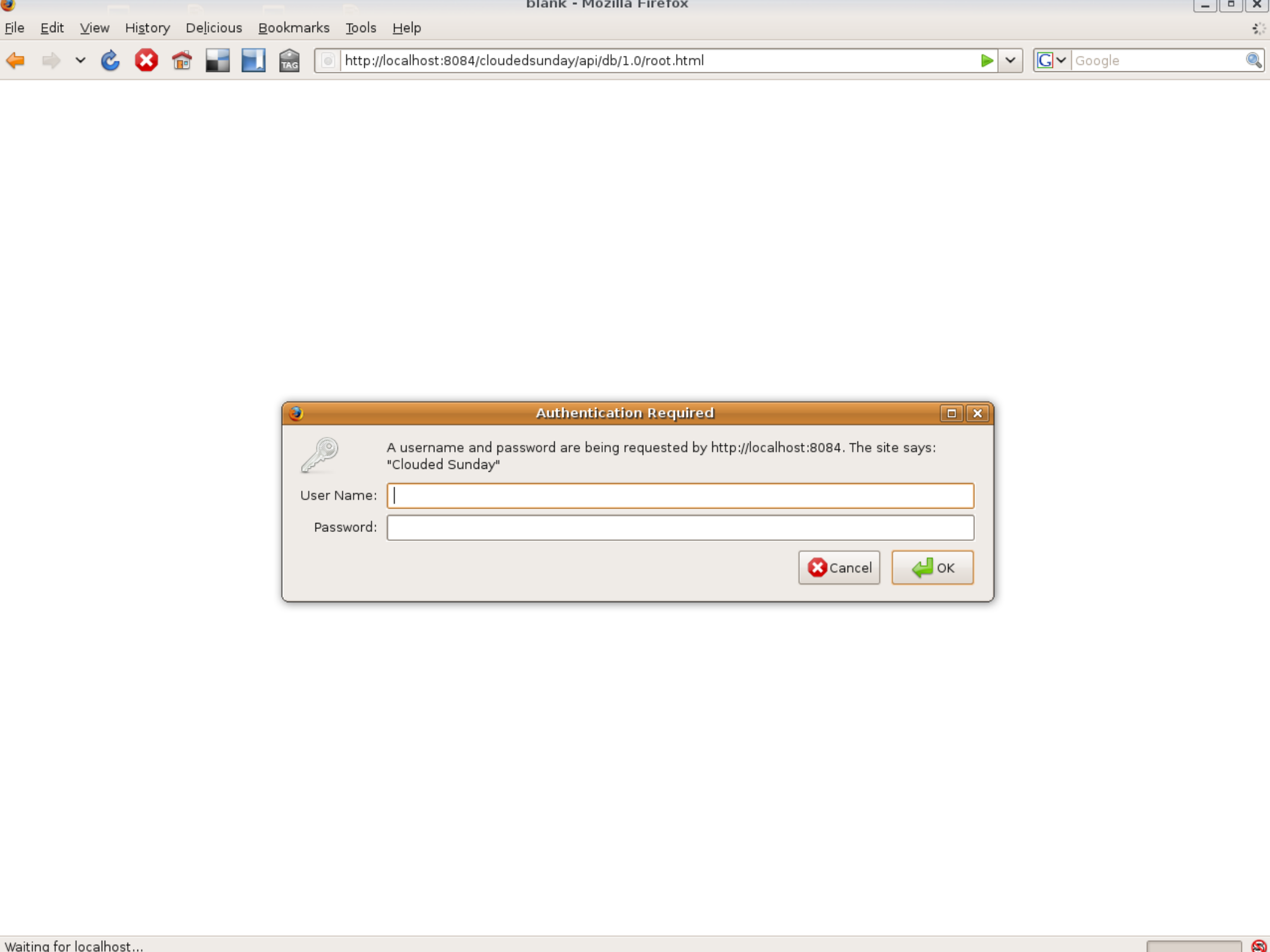
Case Study

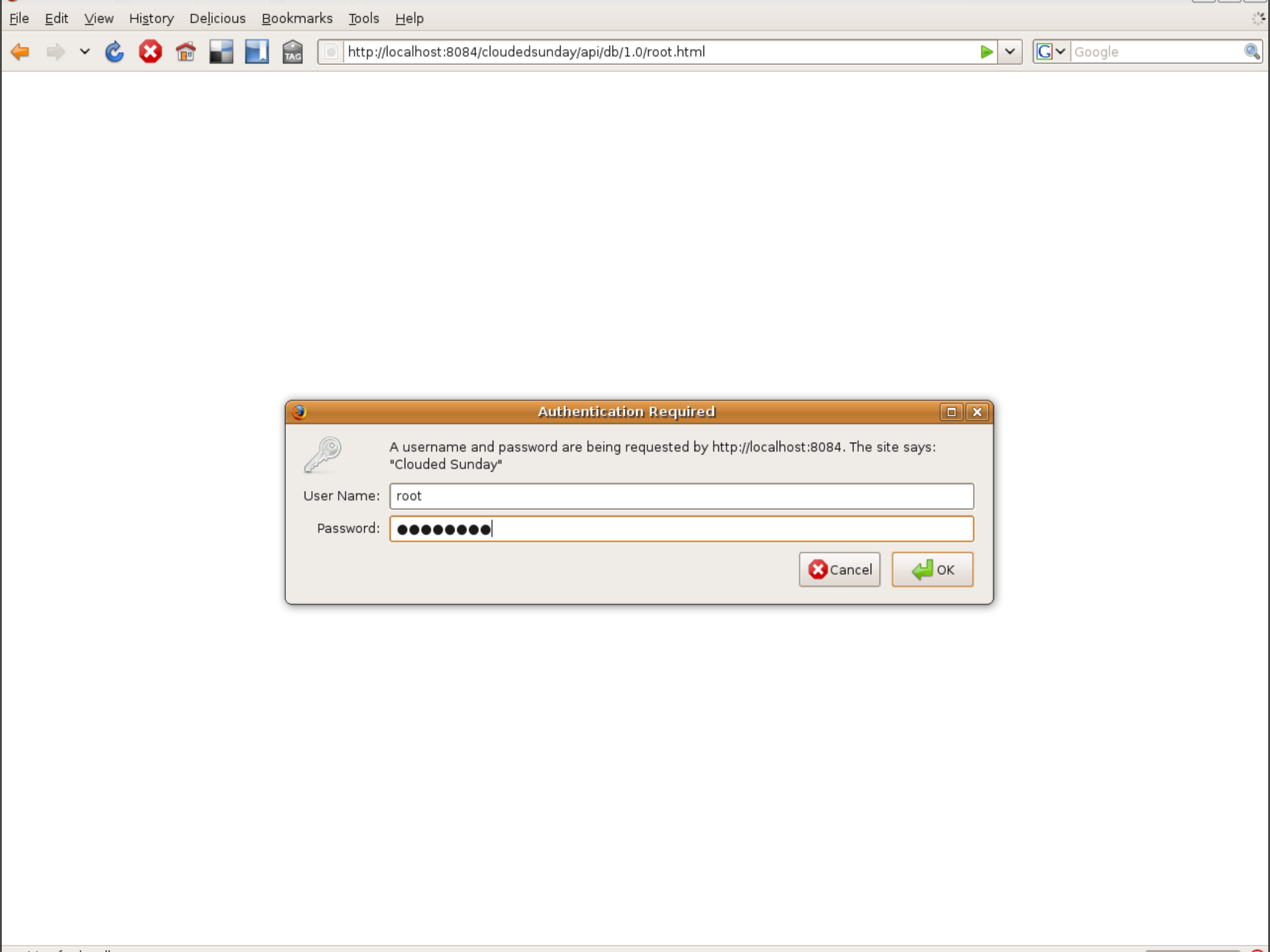
Northwind Database on MySQL Server 5.0 @ Rackspace USA


FK_Orders_Customers
Customers
CustomerID
CompanyName
ContactName
ContactTitle
Address
City
Region
PostalCode
Country
Phone
Fax
Orders
OrderID
CustomerID
EmployeeID
OrderDate
RequiredDate
ShippedDate
ShipVia
Freight
ShipName
ShipAddress
ShipCity
ShipRegion
ShipPostalCode
ShipCountry
FK_Orders_Shippers
Shippers
ShipperID
CompanyName
Phone
FK_Employees_Employees
FK_Orders_Employees
Employees
EmployeeID
LastName
FirstName
Title
TitleOfCourtesy
BirthDate
HireDate
Address
City
Region
PostalCode
Country
Region
RegionID
RegionDescription
FK_Territories_Region
Territories
TerritoryID
TerritoryDescription
RegionID
FK_EmployeeTerritories_Territories
EmployeeTerritories
EmployeeID
TerritoryID
FK_EmployeeTerritories_Employees
FK_CustomerCustomerDemo_Customers
CustomerCustomerDem
CustomerID
CustomerTypeID
FK_Order_Details_Orders
Order Details
OrderID
ProductID
UnitPrice
Quantity
Discount
FK_Order_Details_Products
Products
ProductID
ProductName
SupplierID
CategoryID
QuantityPerUnit
UnitPrice
UnitsInStock
UnitsOnOrder
ReorderLevel
Discontinued
FK_Products_Suppliers
Suppliers
SupplierID
CompanyName
ContactName
ContactTitle
Address
City
Region
PostalCode
Country
Phone
Fax
HomePage
FK_CustomerCustomerDemo
CustomerDemographics
CustomerTypeID
CustomerDesc
Categories
CategoryID
CategoryName
Description
Picture
FK_Products_Categories

Authenticate

- Account
  i.e. company
- Username
  i.e. boss
- Password
  i.e. enter123


blank - Mozilla Firefox
File Edit View History Delicious Bookmarks Tools Help
http://localhost:8084/cloudedsunday/api/db/1.0/root.html
Google
Authentication Required
A username and password are being requested by http://localhost:8084. The site says:
"Clouded Sunday"
User Name:
Password:
Cancel
OK
Waiting for localhost...


File Edit View History Delicious Bookmarks Tools Help
http://localhost:8084/cloudedsunday/api/db/1.0/root.html
Google
Authentication Required
A username and password are being requested by http://localhost:8084. The site says:
"Clouded Sunday"
User Name:
root
Password:
Cancel
OK

File Edit View History Delicious Bookmarks Tools Help

http://localhost:8084/cloudedsunday/api/db/1.0/root.html

Google

Add New

id	name	type	host	port	schema	username	password	accountid	created	modified	Edit	View tables

Submit Northwind database connection information

- Software Engine Type
  i.e. MySQL, Oracle, etc.
- Host
  i.e. 209.61.139.150, www.domain.gr
- Port
  i.e. 3306
- Schema
  i.e. northwind
- Username
- Password

File Edit View History Delicious Bookmarks Tools Help

http://localhost:8084/cloudedsunday/api/db/1.0/root/addnew.html

Google

id

name northwind

type MYSQL

host 209.61.159.130

port 3306

schema 345406_northwind

username 345406_northuser

password

accountid 1

created 2009-06-18 20:22:50.56

modified 0000-00-00 00:00:00

Submit Reset

Send the connection information

POST
/api/db/1.0/root/addnew.html
Media: Multipart Form Data

File Edit View History Delicious Bookmarks Tools Help

http://localhost:8084/cloudedsunday/api/db/1.0/root.html

Google

Add New

id	name	type	host	port	schema	username	password	accountid	created	modified	Edit	View tables
6	northwind	MYSQL	209.61.159.130	3306	345406_northwind	345406_northuser	gsv-?(2l6x8S	1	2009-06-18 20:22:50.0	2009-06-18 20:24:05.0	Edit	View tables

View "Northwind" database's tables

GET
/api/db/1.0/root/northwind/tables.html

- OR -
/api/db/1.0/root/tables.xml
/api/db/1.0/root/tables.csv
/api/db/1.0/root/tables.xsd

TABLE_NAME	ENGINE	TABLE_ROWS	View data
categories	MyISAM	NULL	View data
customercustomerdemo	MyISAM	NULL	View data
customerdemographics	MyISAM	NULL	View data
customers	MyISAM	NULL	View data
employees	InnoDB	NULL	View data
employeeterritories	InnoDB	NULL	View data
order_details	MyISAM	NULL	View data
orders	InnoDB	NULL	View data
products	MyISAM	NULL	View data
region	MyISAM	NULL	View data
shippers	MyISAM	NULL	View data
shippers_tmp	MyISAM	NULL	View data
suppliers	MyISAM	NULL	View data
territories	InnoDB	NULL	View data
usstates	MyISAM	NULL	View data

View "Categories" table's data

GET /api/db/1.0/root/northwind/categories/data.html

Data : Table categories : Database northwind @root - Clouded Sunday - Mozilla Firefox

File Edit View History Delicious Bookmarks Tools Help

http://localhost:8084/cloudedsunday/api/db/1.0/root/northwind/categories/data.html

Google

CategoryID	CategoryName	Description	Picture
1	Beverages	43 chars	10.52 KB
2	Condiments	58 chars	10.52 KB
3	Confections	35 chars	10.52 KB
4	Dairy Products	7 chars	10.52 KB
5	Grains/Cereals	35 chars	10.52 KB
6	Meat/Poultry	14 chars	10.52 KB
7	Produce	25 chars	10.52 KB
8	Seafood	16 chars	10.52 KB

Done

View "Territories" table's data

GET
/api/db/1.0/root/northwind/territories/data.html

TerritoryID	TerritoryDescription	RegionID
01581	Westboro	1
01730	Bedford	1
01833	Georgetow	1
02116	Boston	1
02139	Cambridge	1
02184	Braintree	1
02903	Providence	1
03049	Hollis	3
03801	Portsmouth	3
06897	Wilton	1
07960	Morristown	1
08837	Edison	1
10019	New York	1
10038	New York	1
11747	Mellvile	1
14450	Fairport	1
19428	Philadelphia	3
19713	Neward	1
20852	Rockville	1
27403	Greensboro	1
27511	Cary	1
29202	Columbia	4
30346	Atlanta	4
31406	Savannah	4
32859	Orlando	4
33607	Tampa	4
40222	Louisville	1
44122	Beachwood	3
45839	Findlay	3
48075	Southfield	3
48084	Troy	3
48304	Bloomfield Hills	3
53404	Racine	3
55113	Roseville	3
55439	Minneapolis	3
60179	Hoffman Estates	2
60601	Chicago	2
72716	Bentonville	4
75234	Dallas	4
78759	Austin	4

Filter table "Territories" where RegionID = 3

GET /api/db/1.0/root/northwind/territories/data.html?RegionID=3

TerritoryID	TerritoryDescription	RegionID
03049	Hollis	3
03801	Portsmouth	3
19428	Philadelphia	3
44122	Beachwood	3
45839	Findlay	3
48075	Southfield	3
48084	Troy	3
48304	Bloomfield Hills	3
53404	Racine	3
55113	Roseville	3
55439	Minneapolis	3

Sort table "Territories" by TerritoryID descending

GET
/api/db/1.0/root/northwind/territories/data.html?
RegionID=3&
_order=TerritoryID:DESC

TerritoryID	TerritoryDescription	RegionID
55439	Minneapolis	3
55113	Roseville	3
53404	Racine	3
48304	Bloomfield Hills	3
48084	Troy	3
48075	Southfield	3
45839	Findlay	3
44122	Beachwood	3
19428	Philadelphia	3
03801	Portsmouth	3
03049	Hollis	3

Show only designated columns

GET
/api/db/1.0/root/northwind/territories/data.html?
RegionID=3&
_order=TerritoryID:DESC&
_show=TerritoryDescription,RegionID

Applications Places System USA Thu Jun 18, 10:45 PM Dimitrios C. Michalakos

TerritoryDescription	RegionID
Minneapolis	3
Roseville	3
Racine	3
Bloomfield Hills	3
Troy	3
Southfield	3
Findlay	3
Beachwood	3
Philadelphia	3
Portsmouth	3
Hollis	3

Inner Join

GET
/api/db/1.
0/root/northwind/employees+orders/data.html

Data : Table employees+orders : Database northwind @root - Clouded Sunday - Mozilla Firefox

File Edit View History Delicious Bookmarks Tools Help

http://localhost:8084/cloudedsunday/api/db/1.0/root/northwind/employees+orders/data.html

Region	PostalCode	Country	HomePhone	Extension	Photo	Notes	ReportsTo	PhotoPath	OrderID	CustomerID	EmployeeID	OrderDate	Requir
NULL	SW1 8JR	UK	(71) 555-4848	3453	33.25 KB	448 chars	2	http://accweb/emmployees/buchanan.bmp	10248	VINET	5	1996-07-04 00:00:00.0	1996-08 00:00:0
NULL	EC2 7JR	UK	(71) 555-7773	428	34.11 KB	324 chars	5	http://accweb/emmployees/davolio.bmp	10249	TOMSP	6	1996-07-05 00:00:00.0	1996-08 00:00:0
WA	98052	USA	(206) 555-8122	5176	31.03 KB	218 chars	2	http://accweb/emmployees/peacock.bmp	10250	HANAR	4	1996-07-08 00:00:00.0	1996-08 00:00:0
WA	98033	USA	(206) 555-3412	3355	33.23 KB	239 chars	2	http://accweb/emmployees/leverling.bmp	10251	VICTE	3	1996-07-08 00:00:00.0	1996-08 00:00:0
WA	98052	USA	(206) 555-8122	5176	31.03 KB	218 chars	2	http://accweb/emmployees/peacock.bmp	10252	SUPRD	4	1996-07-09 00:00:00.0	1996-08 00:00:0
WA	98033	USA	(206) 555-3412	3355	33.23 KB	239 chars	2	http://accweb/emmployees/leverling.bmp	10253	HANAR	3	1996-07-10 00:00:00.0	1996-07 00:00:0
NULL	SW1 8JR	UK	(71) 555-4848	3453	33.25 KB	448 chars	2	http://accweb/emmployees/buchanan.bmp	10254	CHOPS	5	1996-07-11 00:00:00.0	1996-08 00:00:0
NULL	WG2 7LT	UK	(71) 555-4444	452	33.59 KB	95 chars	5	http://accweb/emmployees/davolio.bmp	10255	RICSU	9	1996-07-12 00:00:00.0	1996-08 00:00:0
WA	98033	USA	(206) 555-3412	3355	33.23 KB	239 chars	2	http://accweb/emmployees/leverling.bmp	10256	WELLI	3	1996-07-15 00:00:00.0	1996-08 00:00:0
WA	98052	USA	(206) 555-8122	5176	31.03 KB	218 chars	2	http://accweb/emmployees/peacock.bmp	10257	HILAA	4	1996-07-16 00:00:00.0	1996-08 00:00:0
WA	98122	USA	(206) 555-9857	5467	32.8 KB	175 chars	2	http://accweb/emmployees/davolio.bmp	10258	ERNSH	1	1996-07-17 00:00:00.0	1996-08 00:00:0
WA	98052	USA	(206) 555-8122	5176	31.03 KB	218 chars	2	http://accweb/emmployees/peacock.bmp	10259	CENTC	4	1996-07-18 00:00:00.0	1996-08 00:00:0
WA	98052	USA	(206) 555-8122	5176	31.03 KB	218 chars	2	http://accweb/emmployees/peacock.bmp	10260	OTTIK	4	1996-07-19 00:00:00.0	1996-08 00:00:0
WA	98052	USA	(206) 555-8122	5176	31.03 KB	218 chars	2	http://accweb/emmployees	10261	QUEDE	4	1996-07-19 00:00:00.0	1996-08 00:00:0

Done

Left Outer Join

GET
/api/db/1.0/root/northwind/employees!
+employeeterritories/data.html

Data : Table employees!+employeeterritories : Database northwind @root - Clouded Sunday - Mozilla Firefox

File Edit View History Delicious Bookmarks Tools Help

http://localhost:8084/cloudedsunday/api/db/1.0/root/northwind/employees!+employeeterritories/da

CloudedSunday_ellak2009 - ... | Data : Table employees!+e... | Δημήτριος Μιχαλάκος Mail - ...

rstName	Title	TitleOfCourtesy	BirthDate	HireDate	Address	City	Region	PostalCode	Country	HomePhone	Extension	Photo	No
drew	Vice President, Sales	Dr.	1952-02-19 00:00:00.0	1992-08-14 00:00:00.0	908 W. Capital Way	Tacoma	WA	98401	USA	(206) 555-9482	3457	33.2 KB	44 ch
drew	Vice President, Sales	Dr.	1952-02-19 00:00:00.0	1992-08-14 00:00:00.0	908 W. Capital Way	Tacoma	WA	98401	USA	(206) 555-9482	3457	33.2 KB	44 ch
drew	Vice President, Sales	Dr.	1952-02-19 00:00:00.0	1992-08-14 00:00:00.0	908 W. Capital Way	Tacoma	WA	98401	USA	(206) 555-9482	3457	33.2 KB	44 ch
drew	Vice President, Sales	Dr.	1952-02-19 00:00:00.0	1992-08-14 00:00:00.0	908 W. Capital Way	Tacoma	WA	98401	USA	(206) 555-9482	3457	33.2 KB	44 ch
drew	Vice President, Sales	Dr.	1952-02-19 00:00:00.0	1992-08-14 00:00:00.0	908 W. Capital Way	Tacoma	WA	98401	USA	(206) 555-9482	3457	33.2 KB	44 ch
drew	Vice President, Sales	Dr.	1952-02-19 00:00:00.0	1992-08-14 00:00:00.0	908 W. Capital Way	Tacoma	WA	98401	USA	(206) 555-9482	3457	33.2 KB	44 ch
even	Sales Manager	Mr.	1955-03-04 00:00:00.0	1993-10-17 00:00:00.0	14 Garrett Hill	London	NULL	SW1 8JR	UK	(71) 555-4848	3453	33.25 KB	44 ch
ne	Sales Representative	Ms.	1966-01-27 00:00:00.0	1994-11-15 00:00:00.0	7 Houndstooth Rd.	London	NULL	WG2 7LT	UK	(71) 555-4444	452	33.59 KB	95 ch
ne	Sales Representative	Ms.	1966-01-27 00:00:00.0	1994-11-15 00:00:00.0	7 Houndstooth Rd.	London	NULL	WG2 7LT	UK	(71) 555-4444	452	33.59 KB	95 ch
ncy	Sales Representative	Ms.	1948-12-08 00:00:00.0	1992-05-01 00:00:00.0	507 - 20th Ave. E. Apt. 2A	Seattle	WA	98122	USA	(206) 555-9857	5467	32.8 KB	17 ch
even	Sales Manager	Mr.	1955-03-04 00:00:00.0	1993-10-17 00:00:00.0	14 Garrett Hill	London	NULL	SW1 8JR	UK	(71) 555-4848	3453	33.25 KB	44 ch
even	Sales Manager	Mr.	1955-03-04 00:00:00.0	1993-10-17 00:00:00.0	14 Garrett Hill	London	NULL	SW1 8JR	UK	(71) 555-4848	3453	33.25 KB	44 ch
even	Sales Manager	Mr.	1955-03-04 00:00:00.0	1993-10-17 00:00:00.0	14 Garrett Hill	London	NULL	SW1 8JR	UK	(71) 555-4848	3453	33.25 KB	44 ch
			1955-03-04	1993-10-17	14 Garrett					(71)		33.25	44

Done

Multiple operations scenario

GET
/api/db/1.
0/root/northwind/employees+orders/data.
html?
_page=2&
_pagesize=10&_order=orders.RequiredDate:
DESC&
employees.EmployeeID=7&
orders.ShipVia=2

EmployeeID	LastName	FirstName	Title	TitleOfCourtesy	BirthDate	HireDate	Address	City	Region	PostalCode	Country	HomePh
7	King	Robert	Sales Representative	Mr.	1960-05-29 00:00:00.0	1994-01-02 00:00:00.0	Edgeham Hollow Winchester Way	London	NULL	RG1 9SP	UK	(71) 555-5598
7	King	Robert	Sales Representative	Mr.	1960-05-29 00:00:00.0	1994-01-02 00:00:00.0	Edgeham Hollow Winchester Way	London	NULL	RG1 9SP	UK	(71) 555-5598
7	King	Robert	Sales Representative	Mr.	1960-05-29 00:00:00.0	1994-01-02 00:00:00.0	Edgeham Hollow Winchester Way	London	NULL	RG1 9SP	UK	(71) 555-5598
7	King	Robert	Sales Representative	Mr.	1960-05-29 00:00:00.0	1994-01-02 00:00:00.0	Edgeham Hollow Winchester Way	London	NULL	RG1 9SP	UK	(71) 555-5598
7	King	Robert	Sales Representative	Mr.	1960-05-29 00:00:00.0	1994-01-02 00:00:00.0	Edgeham Hollow Winchester Way	London	NULL	RG1 9SP	UK	(71) 555-5598
7	King	Robert	Sales Representative	Mr.	1960-05-29 00:00:00.0	1994-01-02 00:00:00.0	Edgeham Hollow Winchester Way	London	NULL	RG1 9SP	UK	(71) 555-5598
7	King	Robert	Sales Representative	Mr.	1960-05-29 00:00:00.0	1994-01-02 00:00:00.0	Edgeham Hollow Winchester Way	London	NULL	RG1 9SP	UK	(71) 555-5598
7	King	Robert	Sales Representative	Mr.	1960-05-29 00:00:00.0	1994-01-02 00:00:00.0	Edgeham Hollow Winchester Way	London	NULL	RG1 9SP	UK	(71) 555-5598
7	King	Robert	Sales Representative	Mr.	1960-05-29 00:00:00.0	1994-01-02 00:00:00.0	Edgeham Hollow Winchester Way	London	NULL	RG1 9SP	UK	(71) 555-5598
7	King	Robert	Sales Representative	Mr.	1960-05-29 00:00:00.0	1994-01-02 00:00:00.0	Edgeham Hollow Winchester	London	NULL	RG1 9SP	UK	(71) 555-5598

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