Open Data for Open Science
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What is OData?

- HTTP
- Reach (devices and platforms)
- Metadata
- Formats (ATOM & JSON)
- Semantics (GET/PUT/POST/DELETE)
- Uri Conventions & Query Language

GET ~/Customers(6)
POST JSON Customers
DELETE ATOM Customers(5)
GET ~/Customers?filter=City eq ‘Atlanta’
Why OData?

- HTTP
- Suitable for devices
- Simple
- Powerful
- Eco-system
  - Platforms: Javascript, PHP, Java, .NET, Silverlight, Ruby, iOS etc
  - Producers: SharePoint, DataMarket, CRM, StackOverflow, Netflix etc.
  - Consumers: Excel, Tableau, SharePoint
DEMO exploring an OData Service
Features

- Multiple Formats – via Content Type Negotiation
- Query Language
  - $filter
  - $select
  - $orderby
  - $skip, $top
- Clearly defined semantics for CUD
- Server Driven Paging - $skiptoken
Principles for new features…

- Not having a lot of features is a great feature
- Simple scenarios must remain simple
- Manage bar of entry for both clients and servers
Coming in V3

- Spatial Types and Queries
- Any / All support
- Multi-value properties
- Named (or Multiple) Streams
- Better inheritance support
- Efficient Format
- Extensibility
Examples

- Any / All
  - GET ~/Sensors/?$filter=Readings/any(r: r/Type eq ‘temperature’ AND r/VariationFromMean gt 20.0M)

- Multi-Value
  - GET ~/Satelites(6)/Frequencies

- Named Streams
  - GET ~/Satelites(6)/Video/HiDef/$value
  - GET ~/Satelites(6)/Video/MedDef/$value
Geospatial Data Support

- Entity properties can have geospatial data values.
- Supports full OGC Simple Features type hierarchy.
- Supports both flat-earth and round-earth topologies.
- Supports distance, length, and intersects query functions.
- All the oil rigs in the gulf that have had an accident in the last year, ordered from north to south:
  - /Oilrigs?$filter=geo.intersects(Location, /Areas('Gulf of Mexico')/Region) and DaysSinceAccident Lt 365&$orderby geo.distance(Location, Point(90,-80))
- My nearest 3 friends, right now:
  - /People?$filter=Friends/any(f: f/Name eq 'Alex.James')&$orderby=geo.distance(LastKnownLocation, Point(45.2435, -127.23434))$top=3
Type Hierarchy

- Plus similar for Geography (round-earth)
- Blue types are instantiableable
- OData uses the base type + the blue types
Spatial Extensibility

- Protocol defines how to add support for more query functions.
- High-end geospatial services will do so.
- Can support additional types after the OGC standardizes them.
Recap & Questions
LINKS

▶ OData.org
  ▶ Mailing List – http://odata.org/mailing-list
  ▶ Blog – http://odata.org/blog
  ▶ Consumers
  ▶ Producers
  ▶ Sample Services <-> good for demos
  ▶ OData SDK


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