

BBC Dynamic Semantic Publishing [DSP]

LDBC 2012

- Jem Rayfield : Lead Technical Architect
- BBC Future Media



Outline

BBC World Cup 2010

BBC Sport 2012 + Olympics

BBC News

Benchmarking

Radio since 1922



TV Since 1930



Web since 1994



Welcome to the BBC web server. If you are looking for specific information relating to the BBC, please contact us. All comments or suggestions are welcome at webweaver@bbcnrc.org.uk

-  [The BBC](#) - All BBC information currently available on-line
-  [The BBC Networking Club](#) - Information on what it is and how to become a member
-  [Education on the Web](#) - Resources for all kinds of teaching and learning
-  [BBC Online Projects](#) - Projects developed by the BBC in collaboration with other organisations
-  [Babbage's Guide to the World Wide Web](#) - For those just starting out

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BBC World
Cup 2010

<http://bbc.co.uk/worldcup>

age Per Player

http://news.bbc.co.uk/sport/football/world_cup_2010/groups_and_teams/team/england/wayne_rooney

BBC Home News Sport Weather iPlayer TV Radio More... Search

SPORT WORLD CUP 2010

SPORT FOOTBALL WORLD CUP 2010 GROUPS & TEAMS FIXTURES & RESULTS VIDEO BBC COVERAGE

Wayne Rooney

Position: Striker
Squad number: 10
Date of birth: 24 October, 1985 (24 years old)
Height: 5'10" (178cm)

Tournament totals	
Games played	Shots on target off target
Wayne Rooney	1 2
Total England	9 7
Goals	Assists
Wayne Rooney	0 0
Total England	1 1
Fouls by on	Cards yellow red
Wayne Rooney	0 2
Total England	0 0
England games played	
England v United States	Match report
England v Algeria	Preview

Latest matches

NED 2-0 DEN v DBU Highlights & report

JPN 1-0 CMR v Total England Highlights & report

ITA 1-1 PAR v Total England Highlights & report

NZL v SVK v Total England LIVE BUILD-UP

Features

Who will win the Golden Boot? The players with the Midas touch hoping to scoop the award in South Africa

World Cup scouting: strikers

Top 5 World Cup stories

- BBC gets 545 vuvuzela complaints
- Drogba cleared to wear arm cast
- Rooney back in England training
- Beckenbauer attacks England style
- Tuesday's World Cup 2010 round-up

Top TV and radio BBC iPlayer

Match of the Day Live: 2010 FIFA World Cup: Italy v Paraguay

Match of the Day: 2010 FIFA World Cup: 14/06/2010

Match of the Day: 2010 FIFA World Cup: 13/06/2010

More football on BBC iPlayer

Page Per Team

Text only | Help

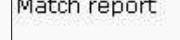
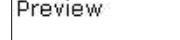
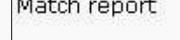
BBC Home News Sport Weather iPlayer TV Radio More... Search

SPORT WORLD CUP 2010

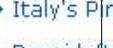
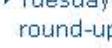


SPORT **FOOTBALL** **WORLD CUP 2010** **GROUPS & TEAMS** **FIXTURES & RESULTS** **VIDEO** **BBC COVERAGE**

Latest matches

NED 2-0 DEN  	Italy  Italy 1-1 Paraguay Monday, 14 June   Italy v New Zealand Sunday, 20 June, 15:00   Slovakia v Italy Thursday, 24 June, 15:00  	Match report  Group F Teams <table border="1"><thead><tr><th></th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th><th>G</th><th>H</th></tr></thead><tbody><tr><td>Italy</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td></td><td></td></tr><tr><td>Paraguay</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td></td><td></td></tr><tr><td>New Zealand</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td></td><td></td></tr><tr><td>Slovakia</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td></td><td></td></tr></tbody></table>		A	B	C	D	E	F	G	H	Italy	0	1	0	0	0	1			Paraguay	0	1	0	0	0	1			New Zealand	0	0	0	0	0	0			Slovakia	0	0	0	0	0	0		
	A	B	C	D	E	F	G	H																																							
Italy	0	1	0	0	0	1																																									
Paraguay	0	1	0	0	0	1																																									
New Zealand	0	0	0	0	0	0																																									
Slovakia	0	0	0	0	0	0																																									

Latest stories

 Buffon confident after back pain  Paraguay boss delighted with draw	 ▶ Gattuso to retire after World Cup	 ▶ Italy's Pirlo to miss two matches
	 ▶ Sunday's World Cup 2010 round-up	 ▶ Rossi left out of Italy Cup squad
	 ▶ Tuesday's World Cup 2010 round-up	 ▶ Prandelli to be next Italy boss
	 ▶ Lippi in post-World Cup exit hint	

Features

 **World Cup 2010 performance analysis**
All the facts and figures from the World Cup 2010 tournament

▶ My World Cup - Noel Gallagher

▶ Guide to the teams at South Africa 2010

Around the web

- ▶ Italian FA site
- ▶ Italy Fifa Profile
- ▶ BBC Search+ country page
- ▶ Italy Wikipedia profile

Top 5 World Cup stories

BBC Home News Sport Weather iPlayer TV Radio More... Search

Sport WORLD CUP 2010



SPORT FOOTBALL WORLD CUP 2010 GROUPS & TEAMS FIXTURES & RESULTS VIDEO BBC COVERAGE



Latest matches

NED 2-0 DEN



▶ Highlights & report

JPN 1-0 CMR



▶ Highlights & report

ITA 1-1 PAR



▶ Highlights & report

NZL v SVK



LIVE BUILD-UP

▶ Watch

Group F

TEAMS	P	W	D	L	F	A	GD	PTS
Italy	1	0	1	0	1	1	0	1
Paraguay	1	0	1	0	1	1	0	1
New Zealand	0	0	0	0	0	0	0	0
Slovakia	0	0	0	0	0	0	0	0

Latest stories

 **Buffon confident after back pain**

 **Paraguay boss delighted with draw**

- ▶ Gattuso to retire after World Cup
- ▶ Skrtel hopeful for opening game
- ▶ Rossi left out of Italy Cup squad
- ▶ Skrtel makes final Slovakia squad
- ▶ Italy's Pirlo to miss two matches
- ▶ Sunday's round-up
- ▶ Tuesday's round-up
- ▶ Cameroon secure Slovakia draw

Latest audio and video

World Cup 2010 extended highlights - Italy 1-1 Paraguay

▶ Watch

Matches

▶ Italy 1-1 Paraguay Match report Monday, 14 June

▶ New Zealand - Slovakia **LIVE** Today 12:30

Slovakia v Paraguay Preview Sunday, 20 June, 12:30

Italy v New Zealand Preview Sunday, 20 June, 15:00

Paraguay v New Zealand Preview Thursday, 24 June, 15:00

Slovakia v Italy Preview Thursday, 24 June, 15:00

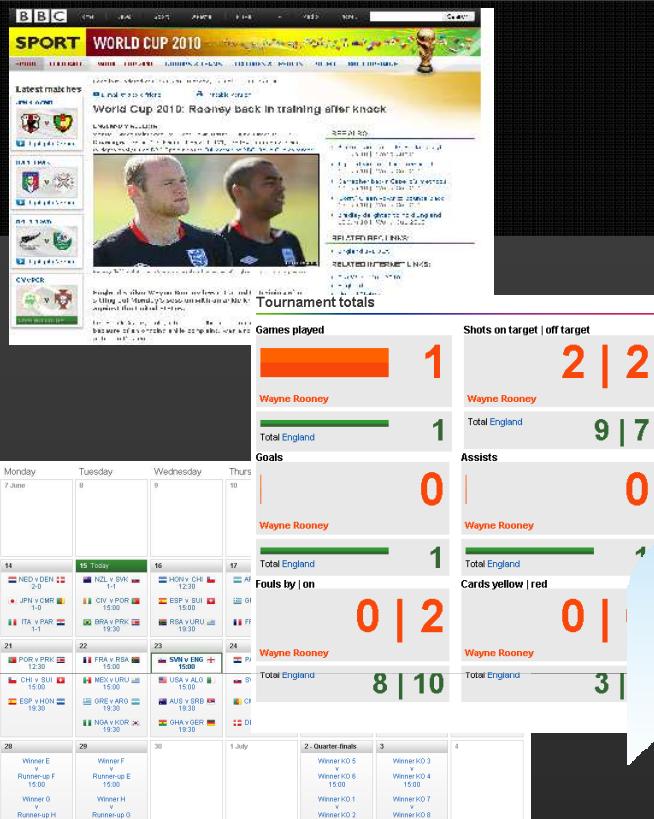
Features

 **World Cup 2010 performance analysis**

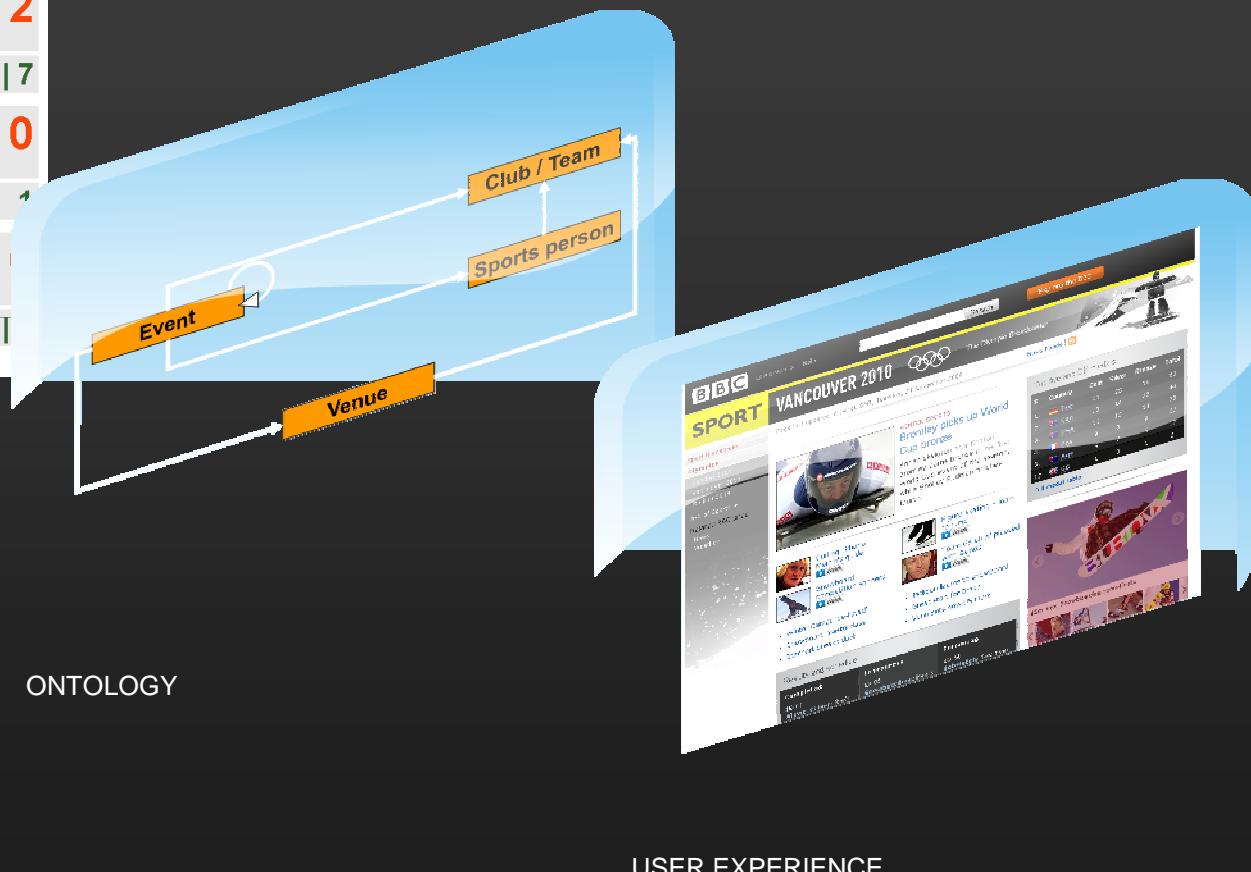
All the facts and figures from the World Cup 2010 tournament

- ▶ Slovakia performance analysis
- ▶ Paraguay performance analysis
- ▶ New Zealand performance analysis
- ▶ My World Cup - Noel Gallagher
- ▶ Guide to the teams at South Africa 2010

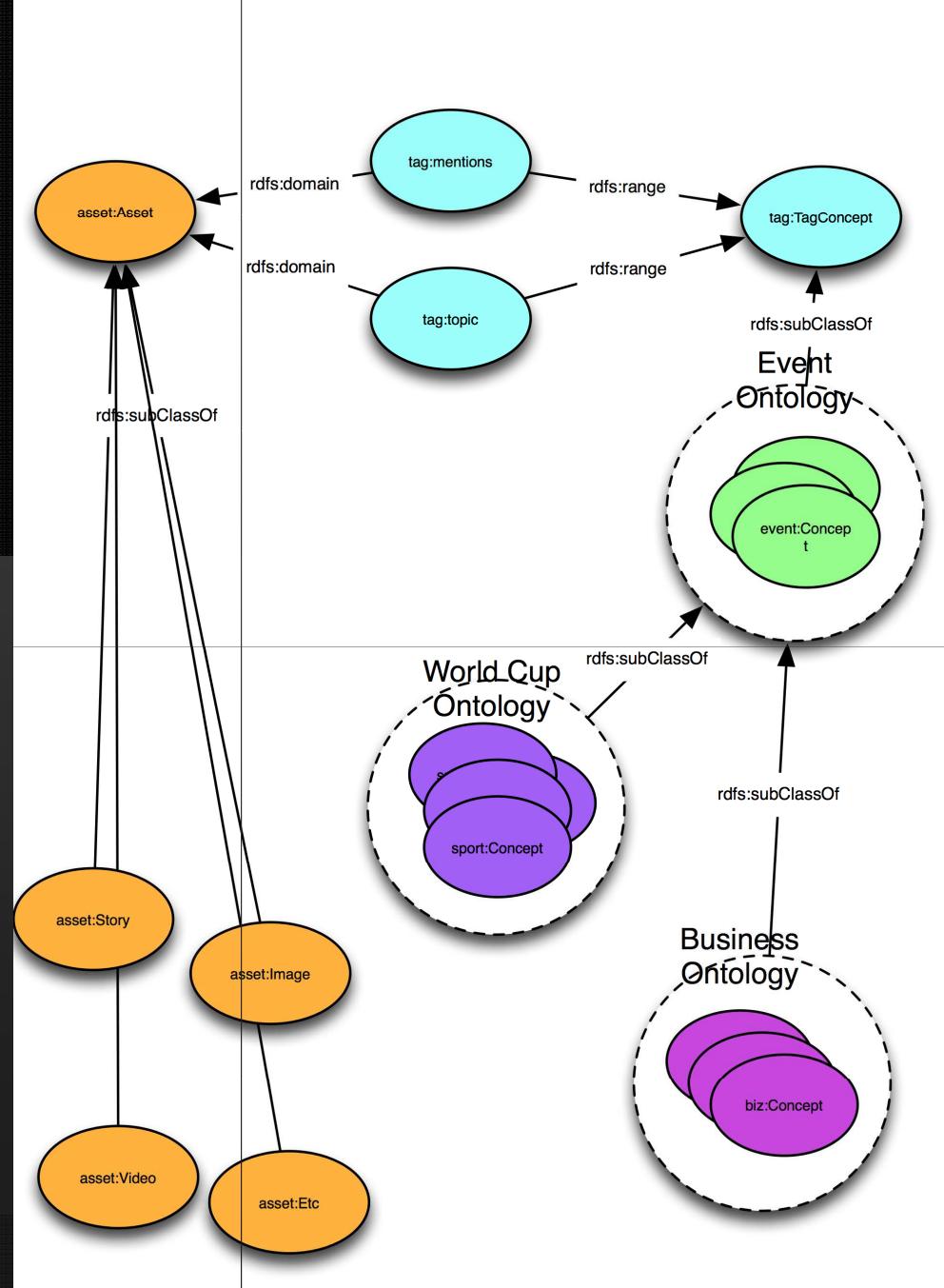
Top 5 World Cup stories



Semantic publishing

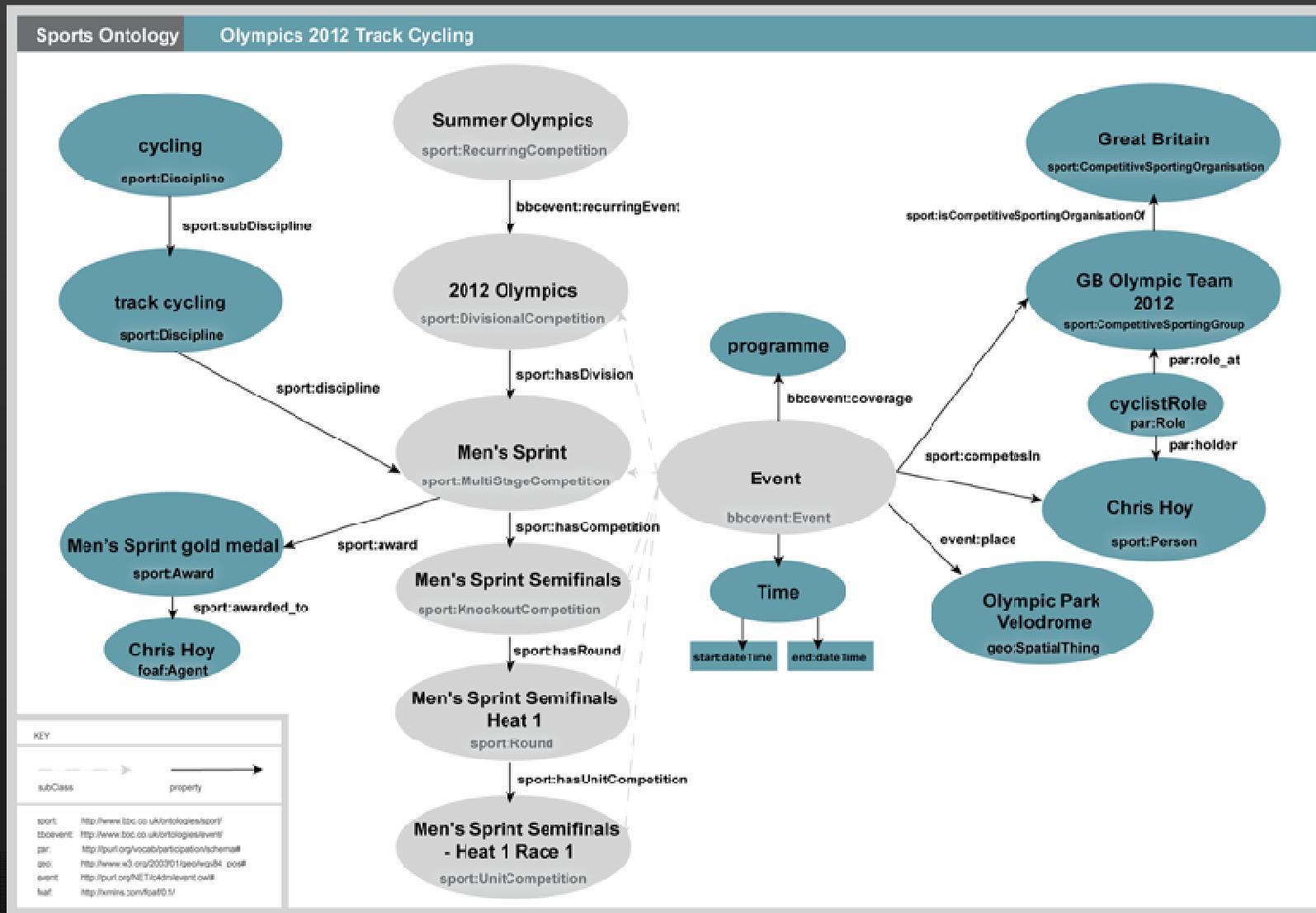


Extendable Domain Driven Asset Tagging



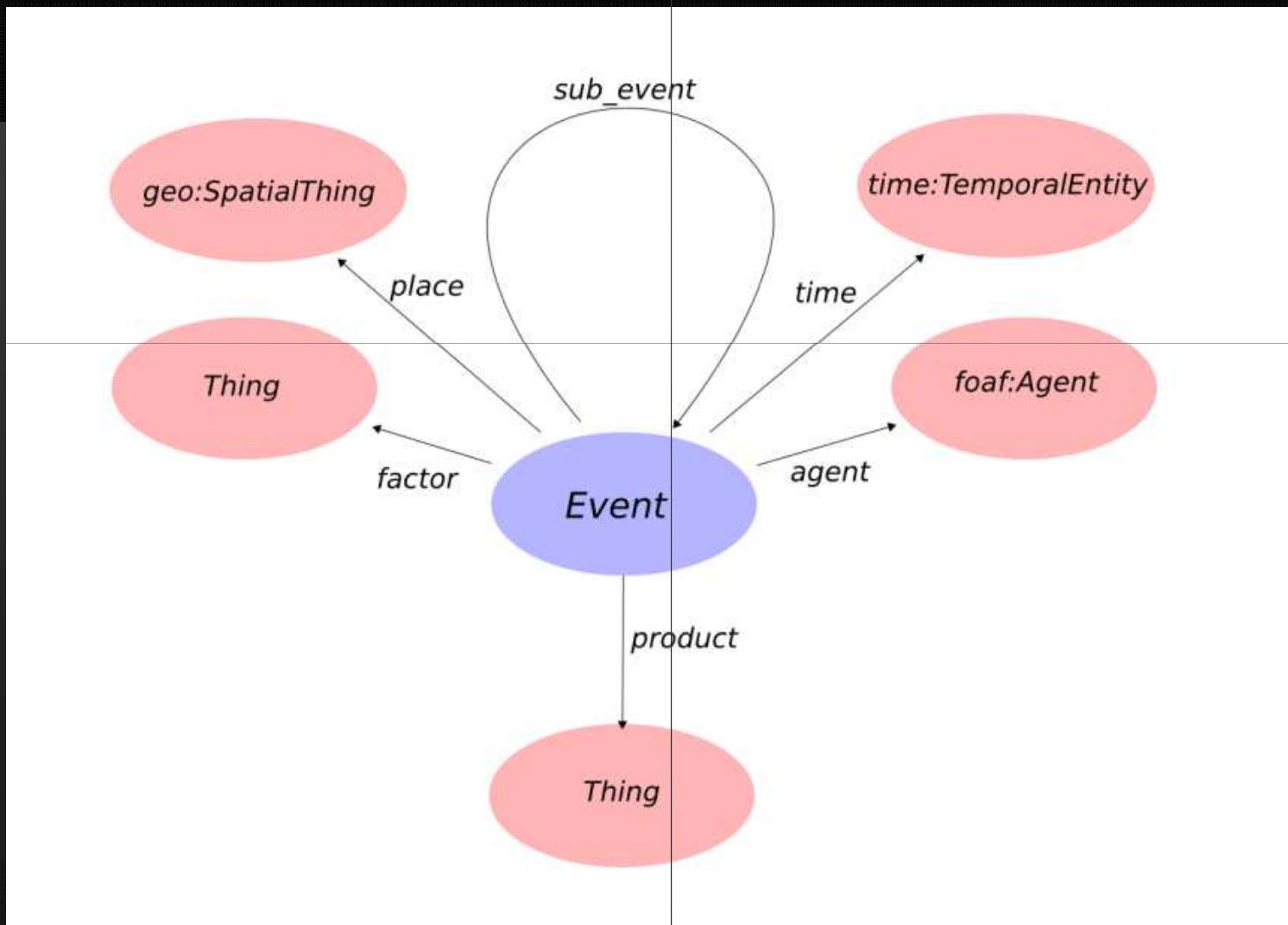
Open Sport Ontology

BC Sport: <http://www.bbc.co.uk/ontologies/sport>



Open Ontology/Dataset reuse

Event | Geonames | Foaf | Etc.



Graffiti: Suggest -> Tag [Player]

Graffiti Version=1.0.0.0 CPS Blogs Admin Help System status: OK Logged in as national\isaact01

Currently viewing: Phil McNulty: Green and Barry on road to recovery (<http://www.bbc.co.uk/blogs/philmcnulty/201>)

Find a blog entry or add a new blog

Green and Barry on road to recovery

Posted Mon 14 Jun 2010, 1:32 PM by Phil McNulty in Phil McNulty

World Cup 2010: Rustenburg Robert Green's work was not being done under the icy gaze of an expectant nation - but he was literally the focus of attention as England got back to World Cup business at their Rustenberg base....

Tag story > Select main topics

Select the topics that this story is primarily focused on. Topics could be anything from a person or organization to a broad subject such as 'women in the workplace'.

Suggested topics Topic search

- England
- United States
- Algeria
- Robert Green
- Gareth Barry
- Joe Hart

This story is mostly about:

- England
- Robert Green
- Gareth Barry

<< Back Next >>

Tagging progress

View and/or tag the blog entry

Gareth Barry



Personal information

Full name	Gareth Barry
Date of birth	23 February 1981 (age 29)
Place of birth	Hastings , England
Height	1.83 m (6 ft 0 in) [1]
Playing position	Midfielder

Club information

Current club	Manchester City
--------------	-----------------

BBC Future BBC MMX

Graffiti: Suggest -> Tag [Location] (Geonames)

Graffiti Version=1.0.0.0 CPS Blogs Admin Help System status: OK Logged in as national\isaact01

Currently viewing: BBC News - England: Man killed as four lorries crash (<http://www.bbc.co.uk/go/rss/int/news/-/news/uk/england/100818/100818001.xml>)

Man killed as four lorries crash
Posted Wed 18 Aug 2010, 11:31 AM by unknown author in BBC News - England
A man dies in a crash between four lorries, leading to the closure of the M1 and 12-mile tailbacks.

Tag story > Select locations
Select the locations that appear in this story.

Suggested locations Location search

milton

- Milton Keynes, Borough of Milton Keynes, GB
- Milton Ernest, GB
- Milton Regis, County of Kent, GB
- Milton Damerel, County of Devon, GB
- Milton, County of Oxfordshire, GB
- Milton of Murtle, Aberdeen City, GB

These locations appear in the story:

Milton Keynes, Borough of Milton Keynes, GB

<< Back Next >>

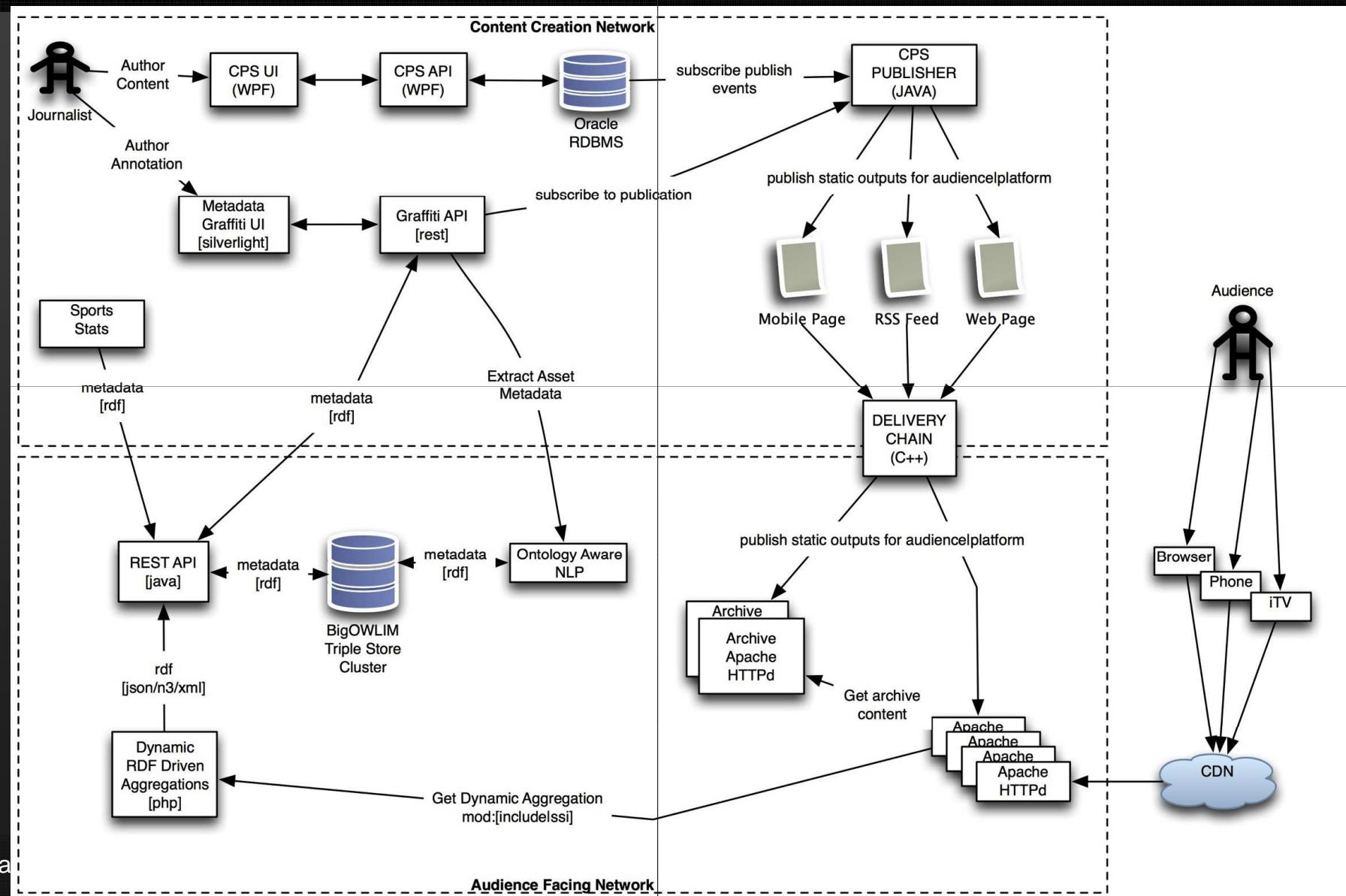
Tagging progress

View and/or tag the blog entry

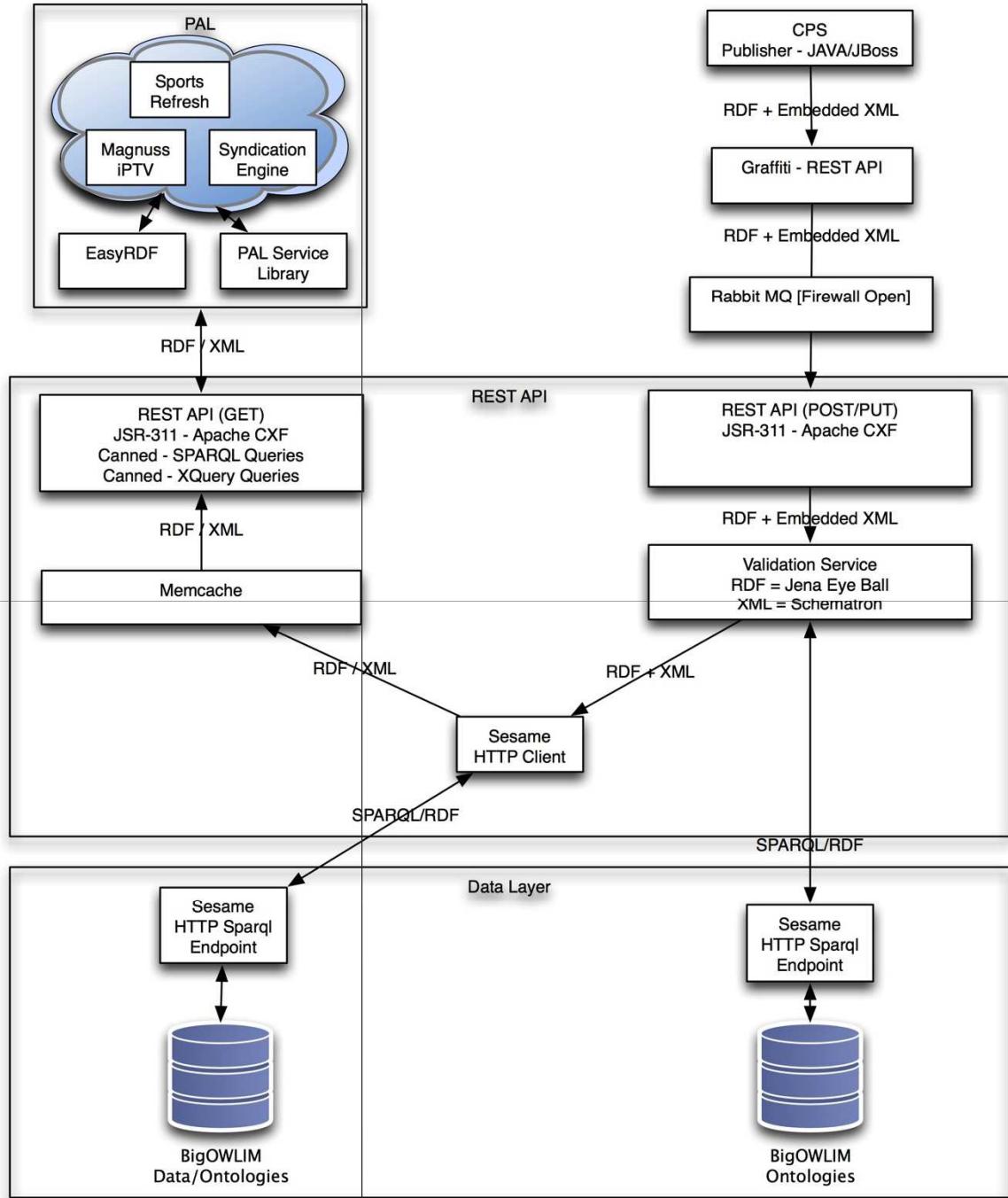


The map shows the United Kingdom with major cities and roads. A green dot marks the location of Milton Keynes, which is highlighted with a black circle and a red arrow pointing to it from the 'These locations appear in the story:' list. The map also shows parts of France and the Channel Islands.

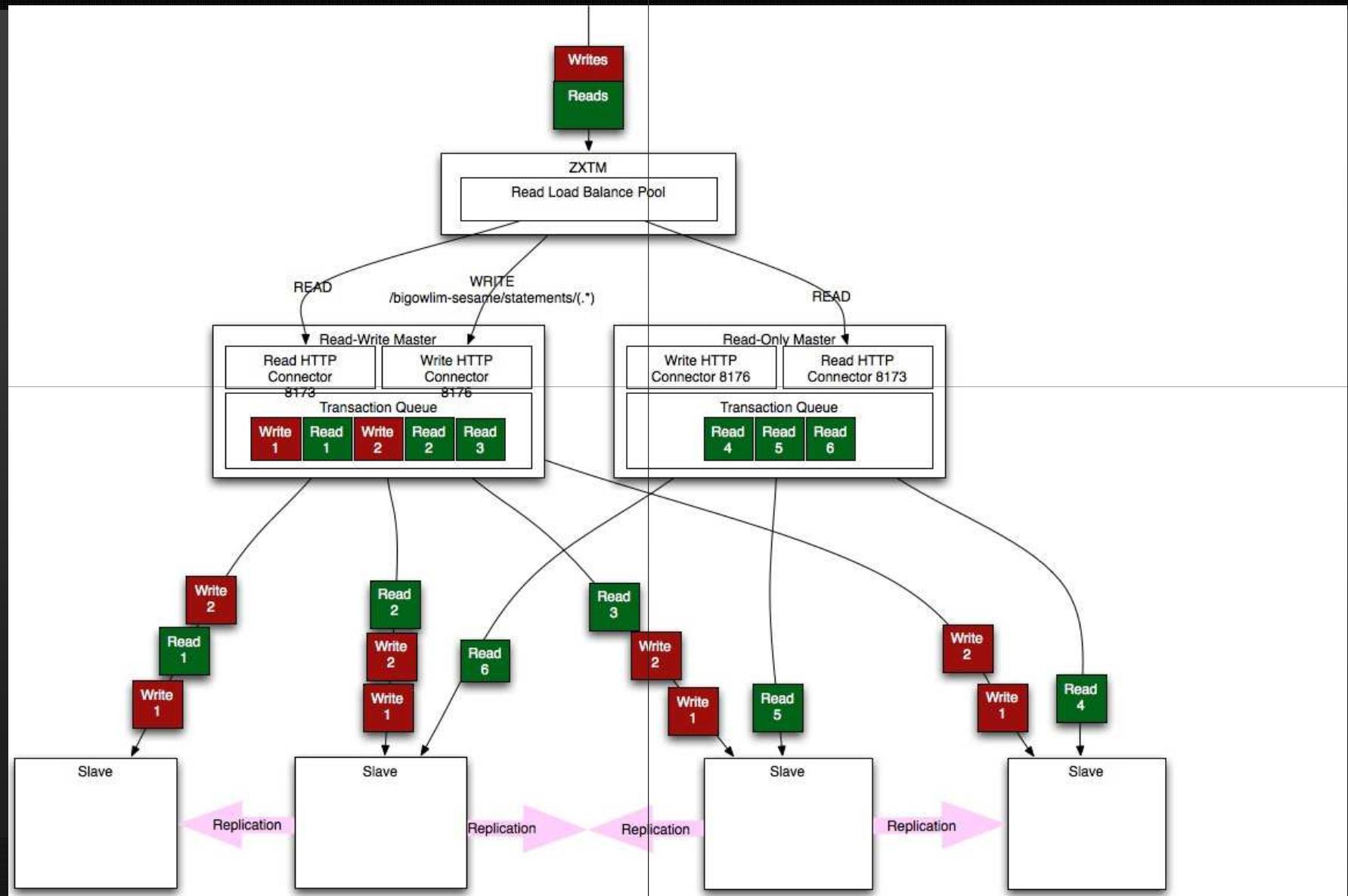
World Cup DSP Architecture



API Stack



Highly Scalable Clustered BigOWLIM



GET Accept text/rdf+n3

<https://api.live.bbc.co.uk/dsp/sport/football/teams/chelsea>

```
<http://www.chelseafc.com/>
  domain:documentType <http://www.bbc.co.uk/things/document-types/homepage> , <http://www.bbc.co.uk/things/document-types/external> .

<http://www.bbc.co.uk/sport/football/teams/chelsea>
  domain:documentType <http://www.bbc.co.uk/things/document-types/bbc-document> , <http://www.bbc.co.uk/things/document-types/homepage> .

<http://www.bbc.co.uk/things/2acacd19-6609-1840-9c2b-b0820c50d281#id>
  a sport:CompetitiveSportingOrganisation ;
  domain:canonicalName
    "Chelsea"^^<xsd:string> ;
  domain:document <http://www.chelseafc.com/> , <http://www.bbc.co.uk/sport/football/teams/chelsea> ;
  domain:externalId <http://dbpedia.org/resource/Chelsea_F.C.> , <urn:sports-stats:137316635> ;
  domain:name "Chelsea" ;
  domain:shortName "Chelsea"^^<xsd:string> ;
  sport:competesIn <http://www.bbc.co.uk/things/5cd4682a-7643-f445-8b1f-bcbaf450bc89#id> .

<http://dbpedia.org/resource/Chelsea_F.C.>
  domain:externalIdType
    <http://www.bbc.co.uk/things/external-id-types/dbpedia> .

<urn:sports-stats:137316635>
  domain:externalIdType
    <http://www.bbc.co.uk/things/external-id-types/bbc-sport-stats> .

<http://www.bbc.co.uk/things/5cd4682a-7643-f445-8b1f-bcbaf450bc89#id>
  domain:canonicalName
    "Premier League"^^<xsd:string> ;
  domain:externalId <urn:sports-stats:118996114> ;
  sport:competitionType
    <http://www.bbc.co.uk/things/competition-types/domestic-league> .
```

PHP->EasyRDF->API

**PHP Render layer consumes RDF from REST API via EasyRDF
(<http://www.aelius.com/njh/easyrdf/>)**

**EasyRDF open PHP library
(Primary committer Nicholas Humphrey BBC)**

```
protected function getOptions() {
    return array(
        "config" => array("usecert" => true),
        "headers" => array(
            "Accept" => "application/rdf+json",
            "X-Expect" => "http://www.bbc.co.uk/things/platforms/hiweb"
        )
);

$options = $this->getOptions()
$response = $this->get("https://api.test.bbc.co.uk/dsp/sport/football/teams/chelsea", $options)
$this->data = new EasyRdf_Graph("http://www.bbc.co.uk", $response->getBody());
$teams = $this->data->allOfType("sport:CompetitiveSportingOrganisation")
```

World Cup statistics the GOOD

- 750+ Dynamic aggregations/pages (Player, Squad, Group, etc..)
- Average unique page requests a day : 2 million +
- Average OWLIM SPARQL queries a day : 1 million
- 100s RDF statement updates/inserts per minute with full OWL reasoning and associated inference.
- Multi data center fully resilient, clustered 6 node triple store
- RDF graph model ideally suited to model domain representations such as sport

World Cup statistics the BAD

- Sports stories and indices static
- Sport content not responsive or personalized
- RDF Store unable to handle thousands of statistic updates a second
- RDF Store forward-chained closures expensive increase write latency
- RDF graph model and SPARQL not ideally suited to the BBC's News and Sport document publication model

BBC Sport 2012; Online Refresh



<http://bbc.co.uk/sport>

Sport Refresh 2012

Page per Athlete [10,000+], Page per country [200+], Page per Discipline [400-500], Page per venue, Page per team

→ A lot of output...

Almost real time statistics and live event pages

Time coded, metadata annotated, on demand video, 58,000 hours of content

Far too many web pages for far too few journalists

DSP annotation architecture to automate content aggregation

Sport Refresh 2012; Red -> Bright Yellow

SPORT

FOOTBALL

Chelsea

Last updated at 12:03 BST, 24/05/11

Ancelotti sacking 'bad for game'

Chelsea's sacking of manager Carlo Ancelotti is "damaging to the game", according to the head of the League Managers' Association Richard Bevan.

Latest stories

- Hiddink 'committed to Turkey job'
- Rangers 'play joker' for Chelsea
- Van Aanholt extends Chelsea deal
- Manager Ancelotti leaves Chelsea
- Everton v Chelsea
- Ancelotti brushes off exit rumour

Latest video and audio

- Seeking Ancelotti is destabilising - Le Saux
- Chelsea can't win title - Ancelotti

Comment and analysis

- Phil McNulty
Ancelotti suffers harsh fate
- Lawro's predictions
- Alistair Magowan - BBC Sport
Park peerless in United's decisive victory
- Ups and downs
- Chelsea defence can set up Tones assault

Around the web

- Official club website
- The BBC is not responsible for the content of external internet sites

Club stats overview

Latest football stories

Recent results

Sunday, 22 May 2011 Barclays Premier League			
Everton	1	-0	Chelsea
Report			

Sunday, 15 May 2011 Barclays Premier League			
Chelsea	2	-2	Newcastle
Report			

Sunday, 8 May 2011 Barclays Premier League			
Man Utd	2	-1	Chelsea
Report			

Barclays Premier League

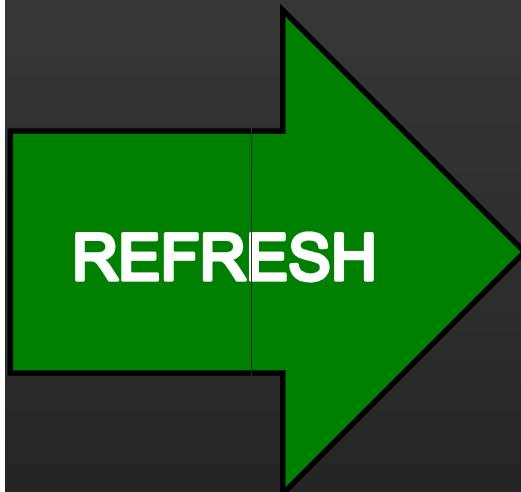
Team	P	GD	PTS
1 Man Utd	38	41	80
2 Chelsea	38	36	71
3 Man City	38	27	71
4 Arsenal	38	29	68
5 Tottenham	38	62	62
6 Liverpool	38	16	59
7 Everton	38	6	54
8 Fulham	38	6	49
9 Aston Villa	38	-11	48
10 Sunderland	38	-11	47
11 West Brom	38	-15	47
12 Newcastle	38	-1	46
13 Stoke	38	-2	46
14 Bolton	38	-4	46
15 Blackburn	38	-13	43
16 Wigan	38	-21	42
17 Wolverhampton	38	-20	40
18 Birmingham	38	-21	39
19 Blackpool	38	-23	39
20 West Ham	38	-27	33

[Full Barclays Premier League table](#)

GET THE LATEST FOOTBALL GOSSIP!

Monday's gossip column

Porto boss Andre Villas-Boas favourite for Chelsea job, plus other rumours



BBC

SPORT FOOTBALL

Chelsea

More Headlines

- QPR set to act over handshake row
- Mourinho wants Chelsea final win
- Lampard 'gutted' for banned Terry
- Terry apologises for sending-off
- Chelsea chief warns over stadium
- Di Matteo 'deserves to stay on'
- Di Matteo revels in Blues heroics
- Barcelona 2-2 Chelsea (agg 2-3)
- Chelsea can defeat Barca - Tones
- Chelsea have to score - Di Matteo
- Chelsea to defy odds - Gudjohnsen
- Spurs need four wins - Redknapp

Suspended Terry can lift trophy

Chelsea captain John Terry can lift the Champions League trophy if they win the final against Bayern Munich.

Last Match

Tue 24 April 2012
CHAMPIONS LEAGUE
vs Barcelona (Away)

Drawn 2 - 2
(Agg 2 - 3)

Next Match

Sun 29 April 2012
PREMIER LEAGUE
vs Queens Park Rangers (Home)
13:30

Latest Video & Audio

- Chelsea will not beat Bayern - Savage
- The story of Chelsea's triumph
- Chelsea win hombu to watch - Cahill

Competitions

Domestic

- PREMIER LEAGUE
- European
- CHAMPIONS LEAGUE

Comment & Analysis

[Show all blogs](#)

- Chelsea rediscover resolve to reach Champions League final
- Pat Nevin and Danny Mills on how Chelsea managed to overcome Barcelona to reach...
- ALISTAIR MAGOWAN - BBC SPORT
Chelsea can prey on Barcelona's weaknesses
- Chelsea midfielder Ramires was rightly lauded for his display in the first leg...

In Pictures

Tuesday's Champions league photos

Around the web

- Anton Ferdinand advised to snub Terry hand
- ESPN SoccerNet
- Bayern Munich take

10000+ Dynamic Aggregations

The collage displays four distinct BBC Sport website pages, each featuring a different theme or sport:

- Sport Football:** Shows a match between Chelsea and QPR, news about John Terry, and a 'Next Match' section for the Premier League.
- Sport Olympics:** Features the London 2012 Olympic logo, news about the Olympic Stadium test event, and profiles of athletes like Bradley Wiggins and Ed Clancy.
- Sport Olympics:** Focuses on Sir Chris Hoy, showing his biography, key facts, and a photo of him with another cyclist.
- Team GB Athletes:** Shows a grid of athlete profiles, including Geraint Thomas, and a section for 'Athletes from Team GB'.

The BBC Sport website is known for its extensive use of dynamic aggregations to deliver personalized content to users based on their interests and location.

Lots of Dynamic (Live) sports stats

It Stands Table			
Show me:	Premier League	UPDATE	
Team	P	GD	Pts
- Man Utd	35	54	83
- Man City	35	60	80
- Arsenal	35	24	65
- Newcastle	34	11	62
- Tottenham	34	18	59
- Chelsea	34	18	58
- Everton	34	4	48
- Liverpool	34	3	46
- Fulham	34	1	46
- West Brom	35	-6	45
- Sunderland	35	1	44
- Swansea	35	-6	43
- Norwich	35	-13	43
- Stoke	34	-16	42
- Aston Villa	35	-14	36
- QPR	35	-18	34
- Wigan	35	-26	34
- Bolton	34	-28	33
- Blackburn	35	-26	31
- Wolves	35	-41	23

[View full table](#)



Europa League Results

Thursday 26th April 2012

UEFA EUROPA LEAGUE

- > Athletic Bilbao 0-0 Sporting (agg 1 - 2) Thu 26 Apr 5' **LIVE**
- > Valencia 0-0 Atl Madrid (agg 2 - 4) Thu 26 Apr 6' **LIVE**

Last updated 5 minutes ago

2012

- 4-2 Valencia Thu 19 Apr Full time
- 2-1 Athletic Bilbao Thu 19 Apr Full time

Last updated 7 days ago

012

- 2-2 Schalke 04 Thu 5 Apr Full time
(agg 6 - 4)
- 1-1 Sporting Thu 5 Apr Full time
(agg 2 - 3)
- 1-2 Atl Madrid Thu 5 Apr Full time
(agg 2 - 4)
- 4-0 AZ Alkmaar Thu 5 Apr Full time
(agg 5 - 2)

Last updated 21 days ago

Latest Football

TODAY (2)

Athletic Bilbao 0 - 0 Sporting (agg 1 - 2)

Valencia 0 - 0 Atl Madrid (agg 2 - 4)

All times UK

[View Live](#)

Europa League

Show me: Group A UP

Group A

Pos	Team	P	GD
1	PAOK Salonika	6	4
2	Rubin Kazan	6	6
3	Tottenham	6	5
4	Shamrock	6	-15

[View](#)

More from Europa League

Olympics - 27 Live Video Streams

Live Stats overlays

Stats -> Ontology driven aggregations



NEWS & CATCH UP LIVE VIDEO

Adlington sets sights on GB medal
Swimming

London 2012 medals

	Gold	Silver	Bronze	Total	
1 ▲ USA	12	9	7	28	
2 ▼ RUS	11	10	6	27	
3 ▷ RUS	6	9	9	24	
4 ▷ KEN	5	9	1	15	
5 ▷ AUS	4	5	5	14	
IS	9 ▷ GBR	2	1	1	4

LIVE BBC One Day 5 Coverage

Diving Men's 10m Platform Final

Cycling - Track Day 5 Morning Session

BBC Three Day 5 Coverage

Athletics Day 5 Morning Session

Rowing Day 5 Coverage

BBC SPORT | OLYMPIC GAMES LONDON 2012

CHOOSE SPORT

Dynamic Schedule

SPORT OLYMPICS



THE OLYMPIC BROADCASTER

Home | Football | Formula 1 | Cricket | Rugby U | Rugby L | Tennis | Golf | London 2012 | More Sports ▾

Schedule & Results | Video | Schedule & Results | Medals | Olympic Sports ▾

120 Share  

Schedule & Results

Picks of the day

Never miss a moment of the Olympic Games

[More video](#)

AVAILABLE SOON	CATCH UP	CATCH UP	CATCH UP	CATCH UP	AVAILABLE SOON
 13:15 - 15:14 Cycling - Mountain Bike	 03h 02m Boxing	 04h 12m Modern Pentathlon	 02h 48m Basketball	 02h 26m Handball	 19:30 - 00:10

Olympic Schedule  List View

July							August											
Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
25	26	27	28	29	30	31	01	02	03	04	05	06	07	08	09	10	11	12
 Archery																		
 Athletics																		
 Badminton																		
 Basketball																		
 Beach Volleyball																		
 Boxing																		
 Canoe Slalom																		

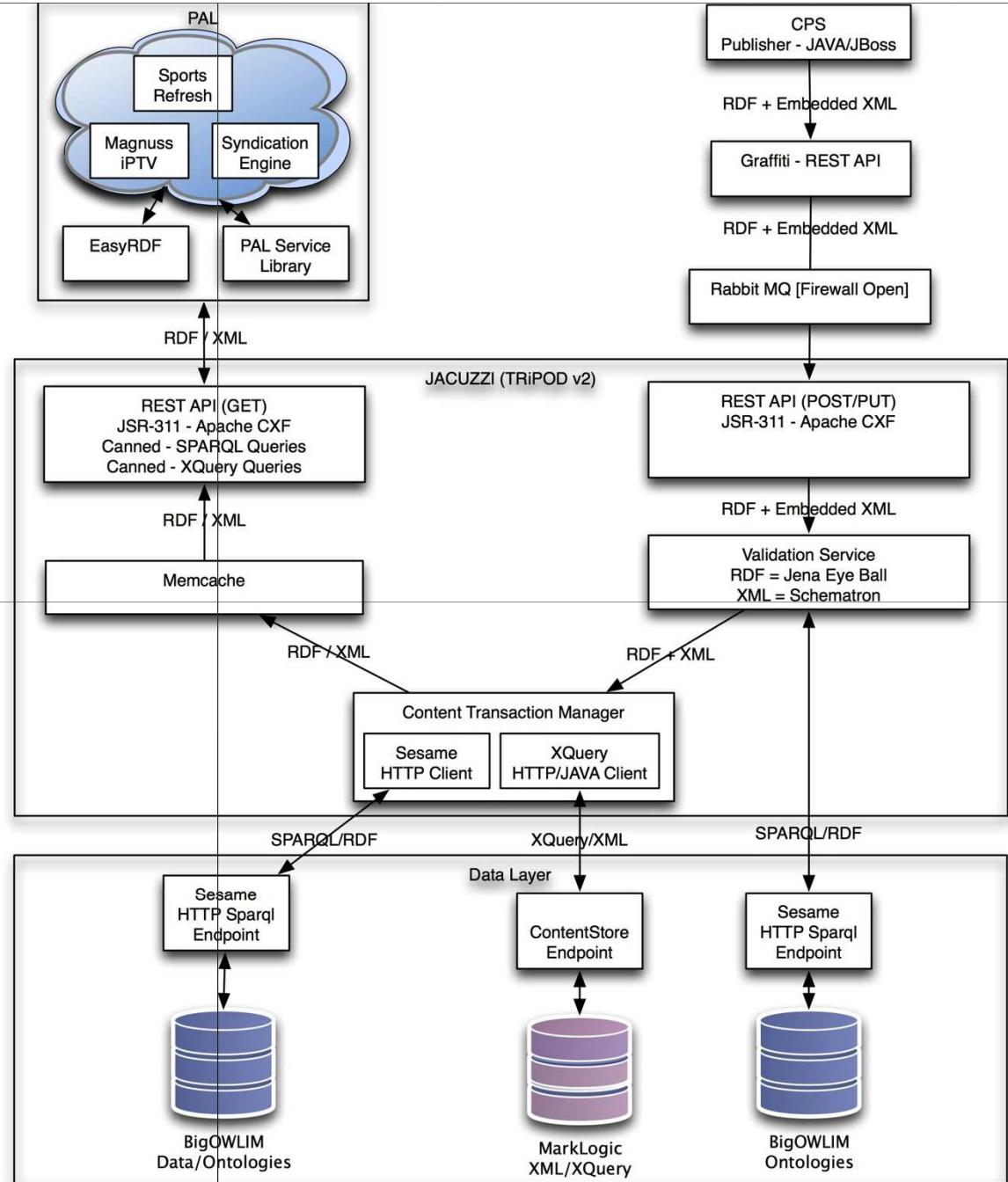
BC Future Media

Augment architecture with a Content Store

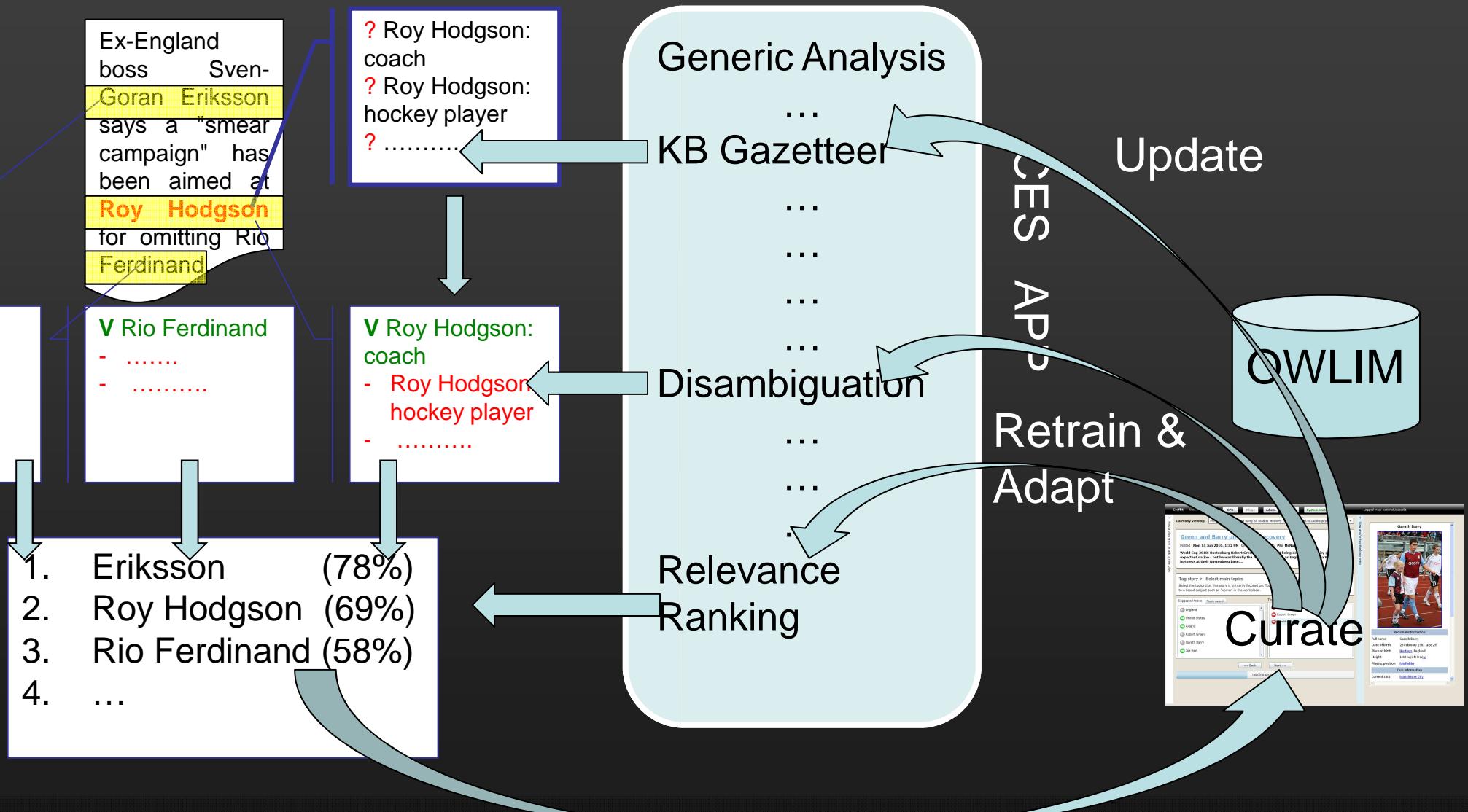
1. Atomic content assets stored in MarkLogic XML store
2. XML content queryable via Xquery
3. Content Assets searchable
4. Sports statistics searchable/queryable via XQuery
5. Ontological SPARQL via BigOWLIM, assets Xquery via MarkLogic

API Stack

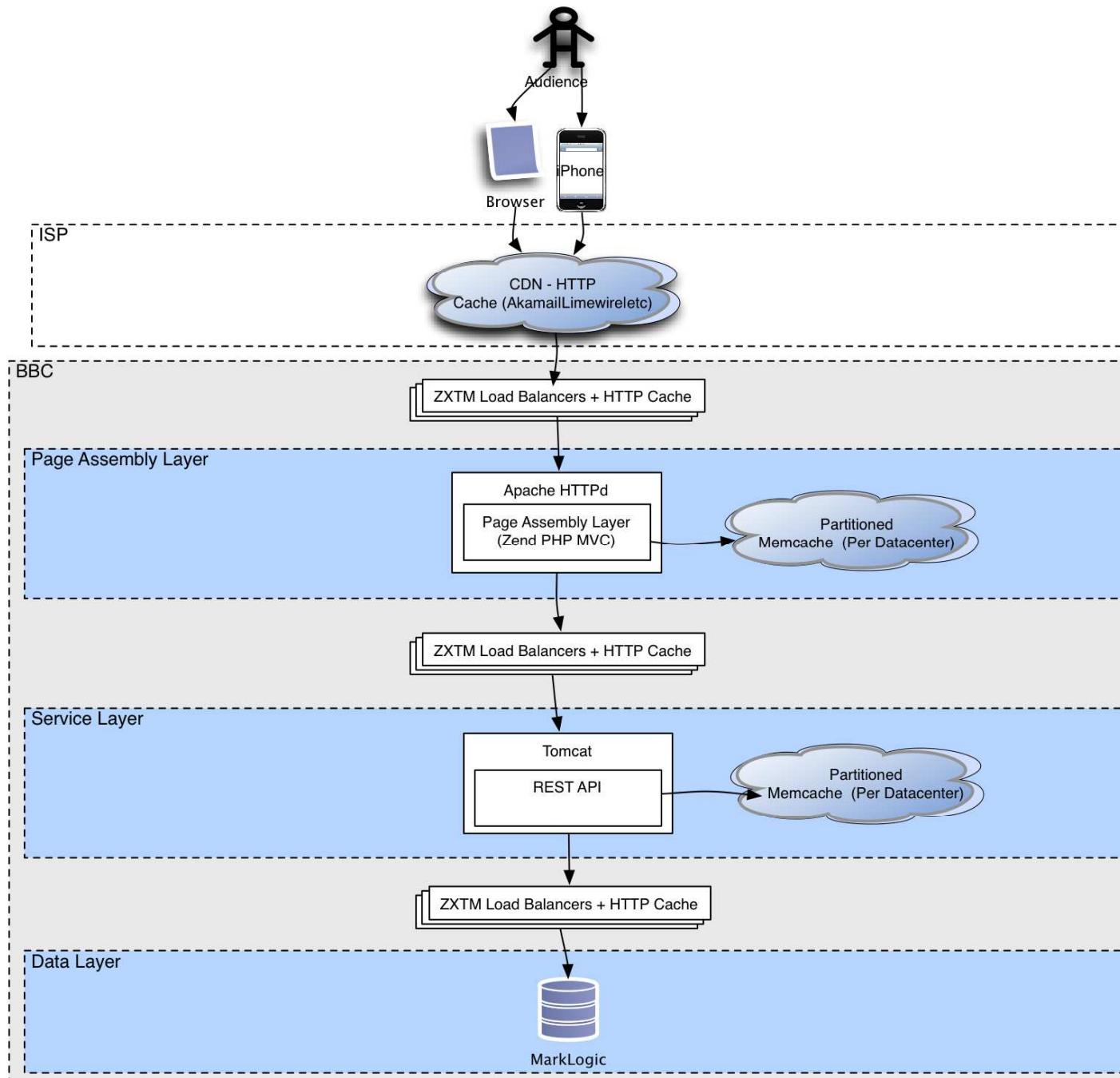
MarkLogic BigOWLIM



Ontology Aware NLP and Semantic Disambiguation



Plenty of Caching



Sport Stats REST API

ST Endpoint for all Sports Stats on BBC

- [/football/teamstats/team/{team}](#)
 - [/clubstats](#)
- [/football/table](#)
 - [/ais/competition/{comp}](#)
 - [/competition/{comp}](#)
 - [/positions/competition/{comp}/team/{team}](#)
 - [/snapshot/competition/{comp}](#)
 - [/structure/{structureid}/group/{groupid}](#)
- [/football/matches](#)
 - [/structure/{structureid}/group/{groupid}](#)
- [/football/match](#)
 - [{matchid}](#)
- [/football/recentresults](#)
 - [/match/{matchid}](#)
- [/football/videoprinter](#)
- [/football/config](#)
 - [/competition/structure/{structureId}](#)
 - [/competition/structure/{structureId}/groups](#)
 - [/competition/{competitionId}/structure/{structureId}/groups](#)
- [/football/stats](#)
 - [/competition/{comp}](#)
 - [/competition/{comp}/team/{team}](#)
- [/cricket/scorecard](#)
 - [{matchid}](#)
- [/cricket/matches](#)
- [/cricket/table](#)
 - [/competition/{comp}](#)
 - [/positions/competition/{comp}/team/{team}](#)
- [/cricket/stats](#)

Sport Stats REST API

L Accessible API

erclays Premier League LIVE as it stands Table

T <https://api.live.bbc.co.uk/sportsdata/statsapi/football/table/ais/competition/118996114>

erclays Premier League LIVE as it stands Table

T <https://api.live.bbc.co.uk/sportsdata/statsapi/football/table/ais/competition/118996114>

cept: application/json

trieve the latest football events ordered by timestamp

T <https://api.live.bbc.co.uk/sportsdata/statsapi/football/videoprinter>

et the formula 1 calendar for the specified season.

T <https://api.int.bbc.co.uk/sportsdata/statsapi/formula1/year/2012/calendar>

cept: application/json

Olympics API (Semantic RDF)

```
/tripod2012
  /athletes
    /{uid}
  /countries
    /{country}
  /countries-iso
    /{iso}
  /sports
    /stories
    /{discipline}
    /{discipline}/events
    /{discipline}/events/stories
    /{discipline}/events/{event}
  /metadata
    /disciplines
  /onestowatch
    /countries/{countryUrlName}
    /london2012
    /sports/{disciplineUrlName}
    /sports/{disciplineUrlName}/events/{eventUrlName}
  /podium/events
    /{rscCode}
  /record/events
  /venues
    /{urlName}
```

@prefix tag: <http://www.w3.org/ns/activitystreams#> .

@prefix oly: <http://www.bbc.co.uk/ontologies/2012olympics/> .

@prefix par: <http://purl.org/vocab/participation/schema#> .

@prefix dc: <http://purl.org/dc/elements/1.1/> .

```
<http://www.bbc.co.uk/things/82f5db84-0591-49ee-b6f4-a1d26e9381fb#id> a sport:Person ;
    rdfs:label "Usain Bolt"^^xsd:string , "Bolt Usain-athletics-jam-1986-08-21"^^xsd:string ;
    foaf:name "Usain Bolt"^^xsd:string , "Bolt Usain-athletics-jam-1986-08-21"^^xsd:string ;
    domain:canonicalName "Bolt Usain-athletics-jam-1986-08-21"^^xsd:string ;
    foaf:givenName "Usain"^^xsd:string ;
    foaf:familyName "Bolt"^^xsd:string ;
    domain:name "Usain Bolt"^^xsd:string ;
    oly:dateOfBirth "1986-08-21"^^xsd:date ;
    oly:gender "M"^^xsd:string ;
    oly:height "195.0"^^xsd:float ;
    oly:weight "94.0"^^xsd:float ;
    oly:worldOlympicDream "true"^^xsd:boolean ;
    sport:discipline <http://www.bbc.co.uk/things/b3a086df-ab42-2b44-be8b-76b600bfcdce#id> ;
    sport:competesIn <http://www.bbc.co.uk/things/1b499a08-4f02-4196-aa6c-c43ea353138b#id> .
```

```
<http://www.bbc.co.uk/things/b3a086df-ab42-2b44-be8b-76b600bfcdce#id> a sport:SportsDiscipline ;
    domain:name "Athletics"^^xsd:string ;
    domain:document <http://www.bbc.co.uk/sport/olympics/2012/sports/athletics> .
```

```
<http://www.bbc.co.uk/things/1b499a08-4f02-4196-aa6c-c43ea353138b#id> a sport:MedalCompetition ;
    domain:name "Men's 100m"^^xsd:string ;
    domain:shortName "Men's 100m"^^xsd:string ;
    domain:document <http://www.bbc.co.uk/sport/olympics/2012/sports/athletics/events/mens-100m> ;
    oly:measurementType <http://www.bbc.co.uk/things/measurement-types/time> ;
    domain:externalId <urn:ioc2012:ATM001000> .
```

```
<http://www.bbc.co.uk/things/903ef380-bdae-4a45-9a8b-5e5a270a7d6c#id> oly:oneToWatch <http://www.bbc.co.uk/things/82f5db84-0591-49ee-b6f4-a1d26e9381fb#id> .
```

```
<http://news.bbc.co.uk/sport1/hi/athletics/16554814.stm#asset> tag:tag <http://www.bbc.co.uk/things/a50dc8ba-947e-4856-8eb0-1cdbbf208ef7#thing> ;
    dc:title "Event Guide: ATHLETICS"^^xsd:string ;
    asset:storyType <http://www.bbc.co.uk/things/story-types/profile> ;
    domain:document <http://news.bbc.co.uk/sport1/mobile/athletics/16554814.stm> .
```

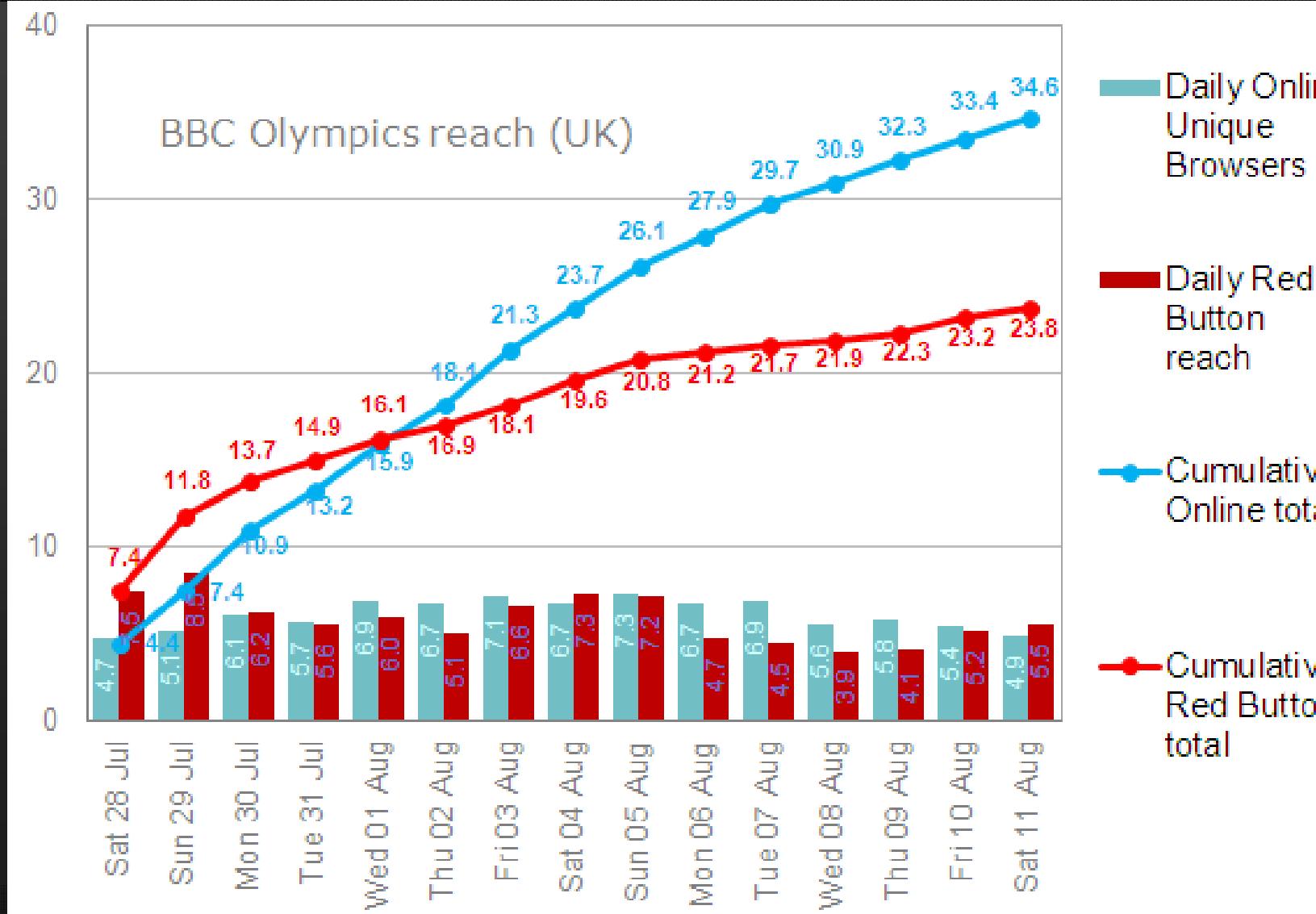
```
<http://www.bbc.co.uk/things/a50dc8ba-947e-4856-8eb0-1cdbbf208ef7#thing> tag:taggedWithTag <http://www.bbc.co.uk/things/b3a086df-ab42-2b44-be8b-76b600bfcdce#id> .
```

```
<http://news.bbc.co.uk/sport1/mobile/athletics/16554814.stm> domain:platform <http://www.bbc.co.uk/things/platforms/mobile> .
```

Olympic numbers

Unique Browser Requests per day peaked at just over 8 million UK and 10 million Globally.

Cumulative Unique browsers online total 34.6 million

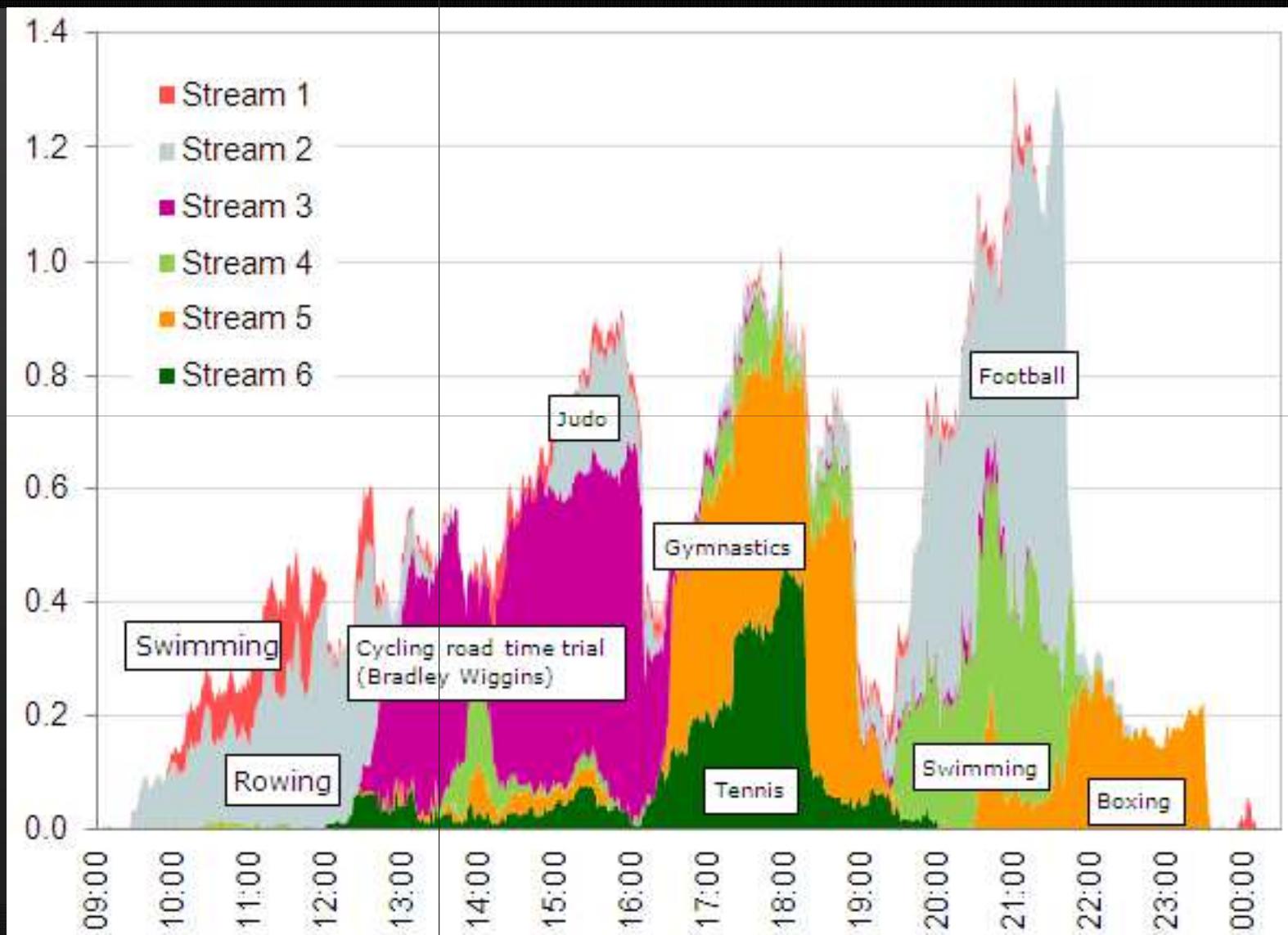


Olympic numbers

In the busiest day, the BBC delivered 2.8 petabytes, with the peak traffic moment occurring when Bradley Wiggins won Gold and we shifted 700 Gb/s.

6 million requests for BBC Olympic video content across online platforms

Number of people watching individual streams →



The BBC News online logo is displayed on a red background. It features the word "BBC" in its signature red, bold, sans-serif font, split into three separate letters within a single horizontal row. Below it, the word "NEWS" is written in a large, white, bold, sans-serif font. At the bottom, the word "online" is written in a smaller, white, bold, sans-serif font.

BBC

NEWS

online

012 → <http://m.bbc.co.uk/news>

Dynamic News mobile

Multi device capability

Responsive Web design

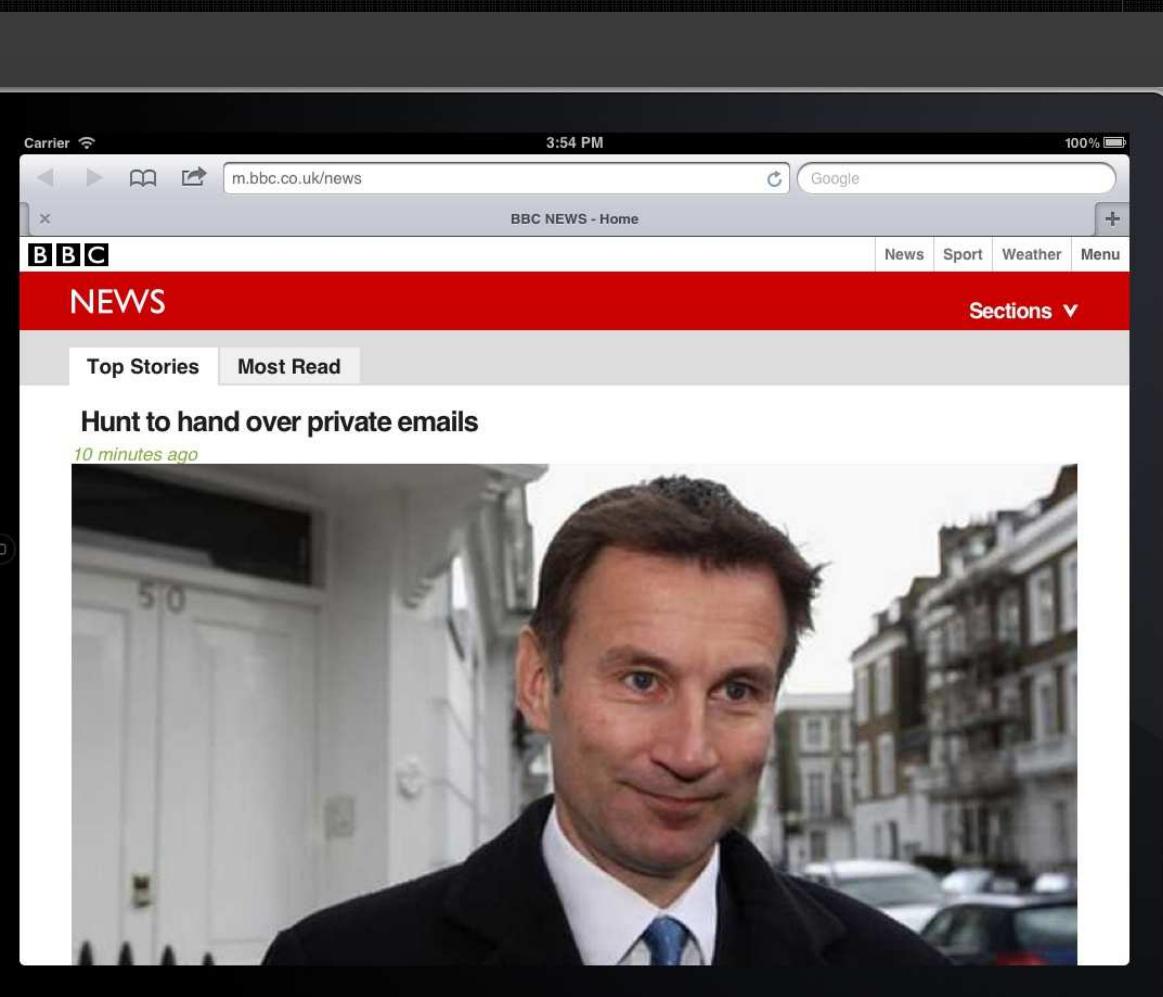
Built on a dynamic service API

New re-usable content model

Dynamic assets + additional ontology models

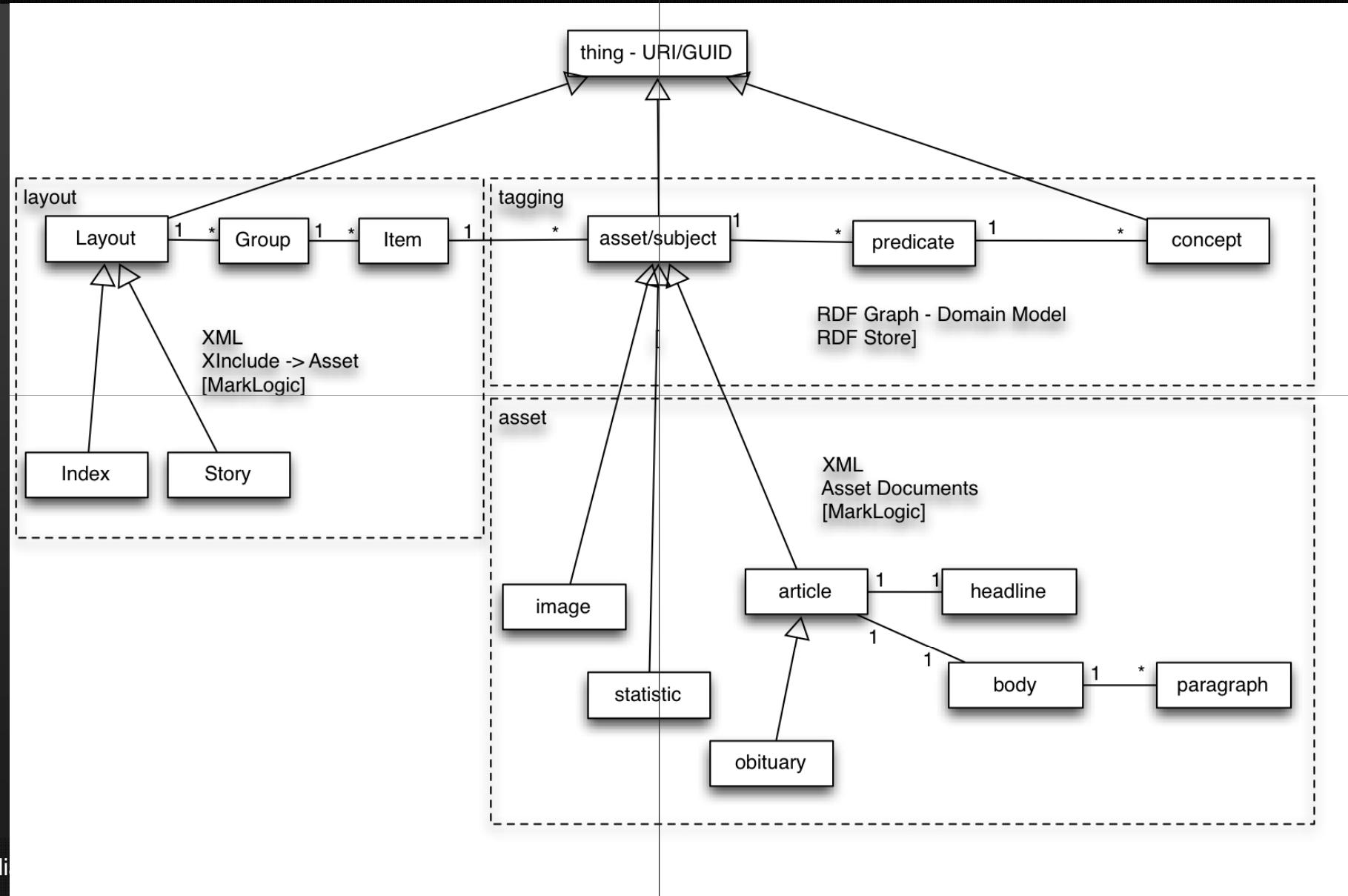
- Geo/Business/Science/NewsEvent/Etc...

Responsive Dynamic News mobile (iPad)



A screenshot of the BBC News mobile website displayed on an iPad. The screen shows a large, high-quality photograph of a man in a dark suit and tie, smiling slightly. The iPad's status bar at the top indicates the time is 3:54 PM and the battery level is 100%. The browser interface includes a back button, forward button, and a search bar labeled 'Google'. Below the search bar, the URL 'm.bbc.co.uk/news' is visible. The main content area features a red header bar with the word 'NEWS' in white. Below this, there are two tabs: 'Top Stories' (which is selected) and 'Most Read'. A headline 'Hunt to hand over private emails' is displayed, followed by a timestamp '10 minutes ago'. The background of the page shows a blurred view of a street with buildings. Below the main headline, there are three smaller news items. The first item has a thumbnail image of the same man in a suit, with the headline 'Jeremy Hunt has said he will hand over emails about the BSkyB takeover bid to the Leveson Inquiry as Labour accuses David Cameron of a "cover-up"' and a timestamp '10 minutes ago'. The second item has a thumbnail image of a different man, with the headline "'Third party role' over spy death" and a timestamp '1 hour ago'. The third item has a thumbnail image of a man with a shaved head, with the headline 'Murder suspect knew first victim' and a timestamp '56 minutes ago'. The background of the page shows a blurred view of a street with buildings.

New Content Model (Re-usable XML/RDF)



Challenges

- High Query throughput many millions of SPARQL queries a day
- Continually changing asset instance data
- Periodic changes to domain instance data sport/news knowledge model
- Simple RDFS/OWL inference (forward chain)
- Read / Write ratio 95% / 5%
- No graph store capable of graph of document queries SPARQL+XQUERY with respect to BBC performance requirements. (Thus multiple data stores)

Challenges

- No benchmarks that cover
 - Existing Benchmarks query mix not representative of BBC SPARQL (simple)
 - Existing Benchmark data set and ingest rates not representative of BBC RDF/model
 - No usable concurrent Read/Write benchmarks with associated inference (BBC use case)
 - Existing benchmarks are normally Bulk load.
 - Benchmark numbers very confusing as underlying topology, kit not standardized. Vendors create NASA clusters to run tests on comparison difficult.
 - No benchmarks with complex cluster topologies (replication). Typical enterprise model

Challenges

- No benchmarks that cover
 - Failure/maintenance scenarios
 - Cluster node failure
 - Backups etc..

Challenges

- BBC would like Benchmarks which provide transparent visibility of:

- Ingest characteristics

- Materialization; different levels of forward/backward chained inference
 - Model complexity; named graphs, simple->complex models
 - Data complexity; sparse/rich with non-standard indices geospatial etc
 - Concurrency; small->large concurrent data writers

- Query characteristics

- Query complexity; simple->complex
 - Backward chained; deduction
 - Concurrency; small-> concurrent query clients
 - Size/Form; Result size and multiple representations (content negotiation)

What can the BBC provide

- Datasets; RDF/OWL
- SPARQL; BBC SPARQL / SPARQL Update
- Usage scenario; Concurrency numbers etc.
- Topology + Enterprise scenarios; cluster, data center, network characteristics, etc

Platform future.....

BBC news completely re-engineered to use semantic approach (News Mobile style)

- Geo aggregations

- News Events

- Business

- Science/Technology

- Etc..

Personalization

Open RDF / LOD + public SPARQL endpoint



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