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JBoss Enterprise App. Platforms Roadmap

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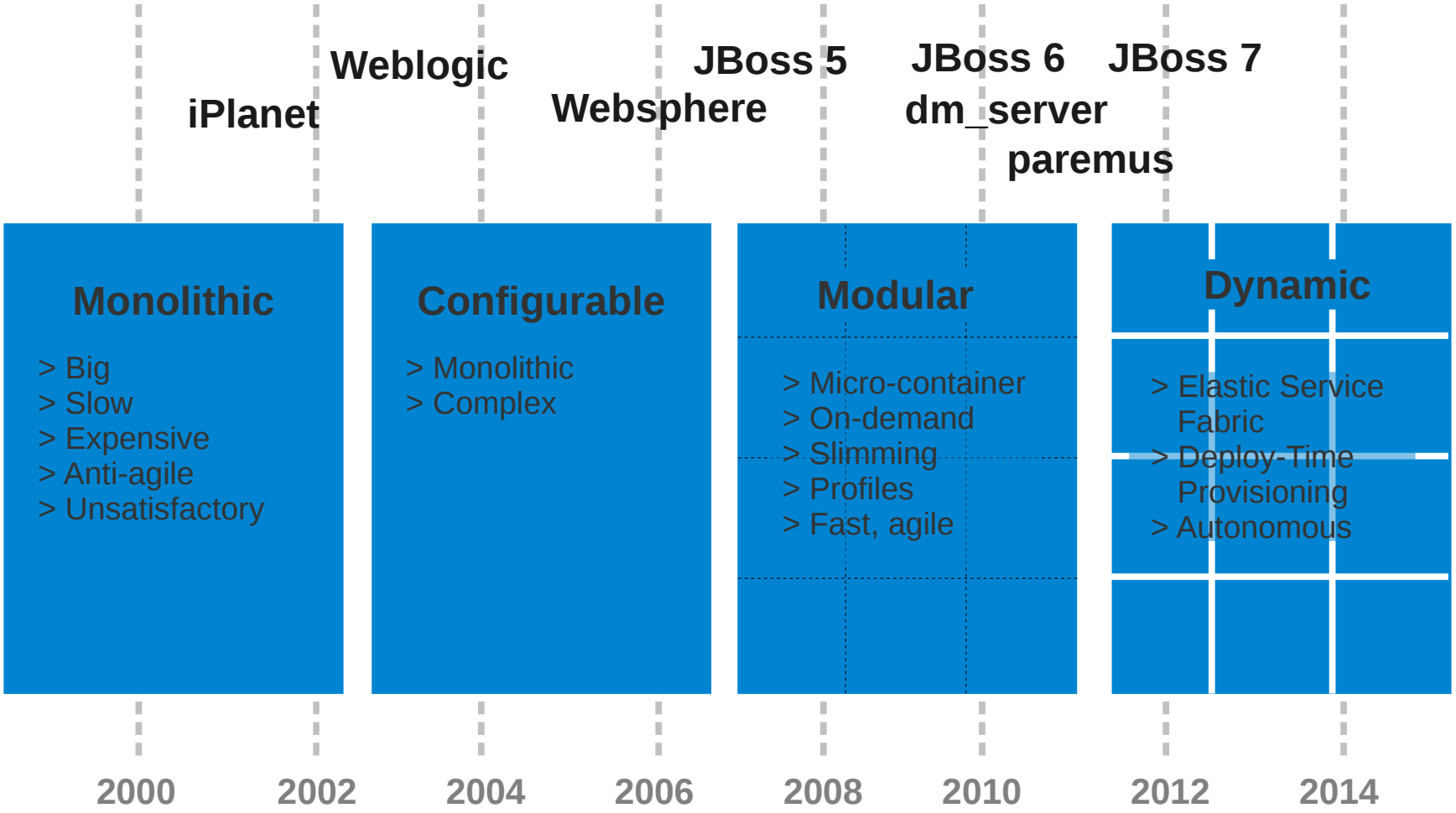
Director of Product Management,
Red Hat
4th April 2011

Agenda

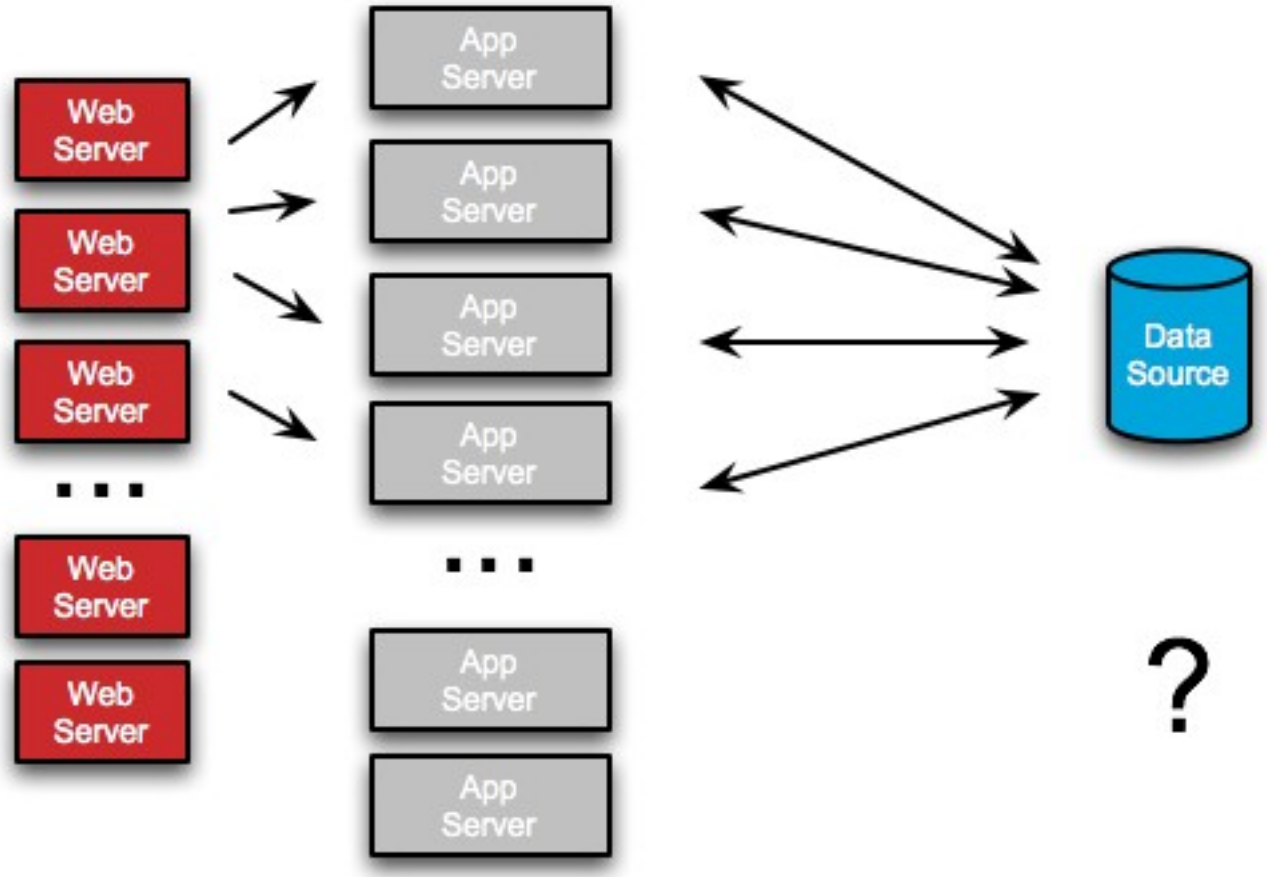
- Where we're heading
- Enterprise Application Platform 6
- Enterprise Data Grid 6

Roadmap

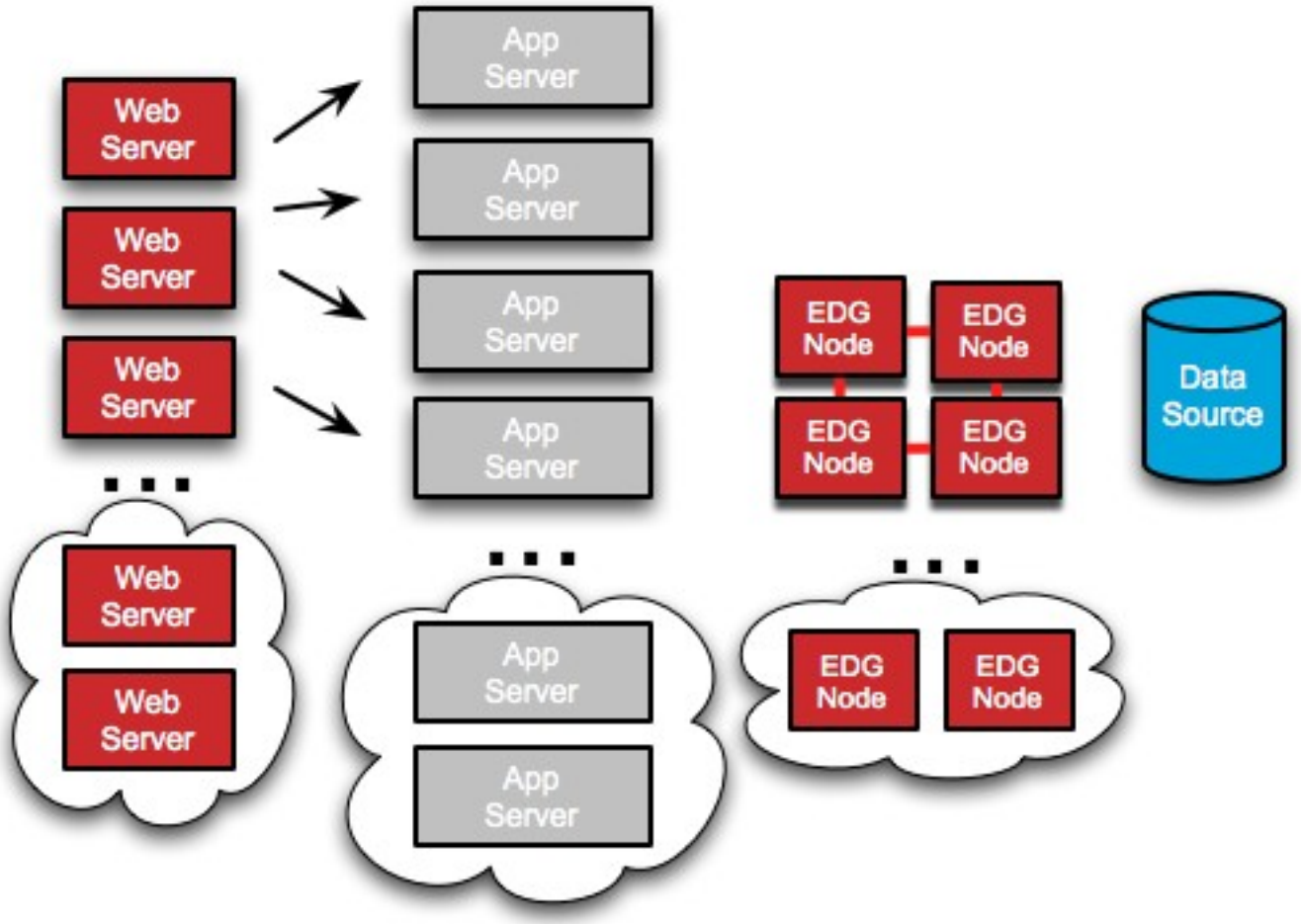
Evolution of Application Platforms



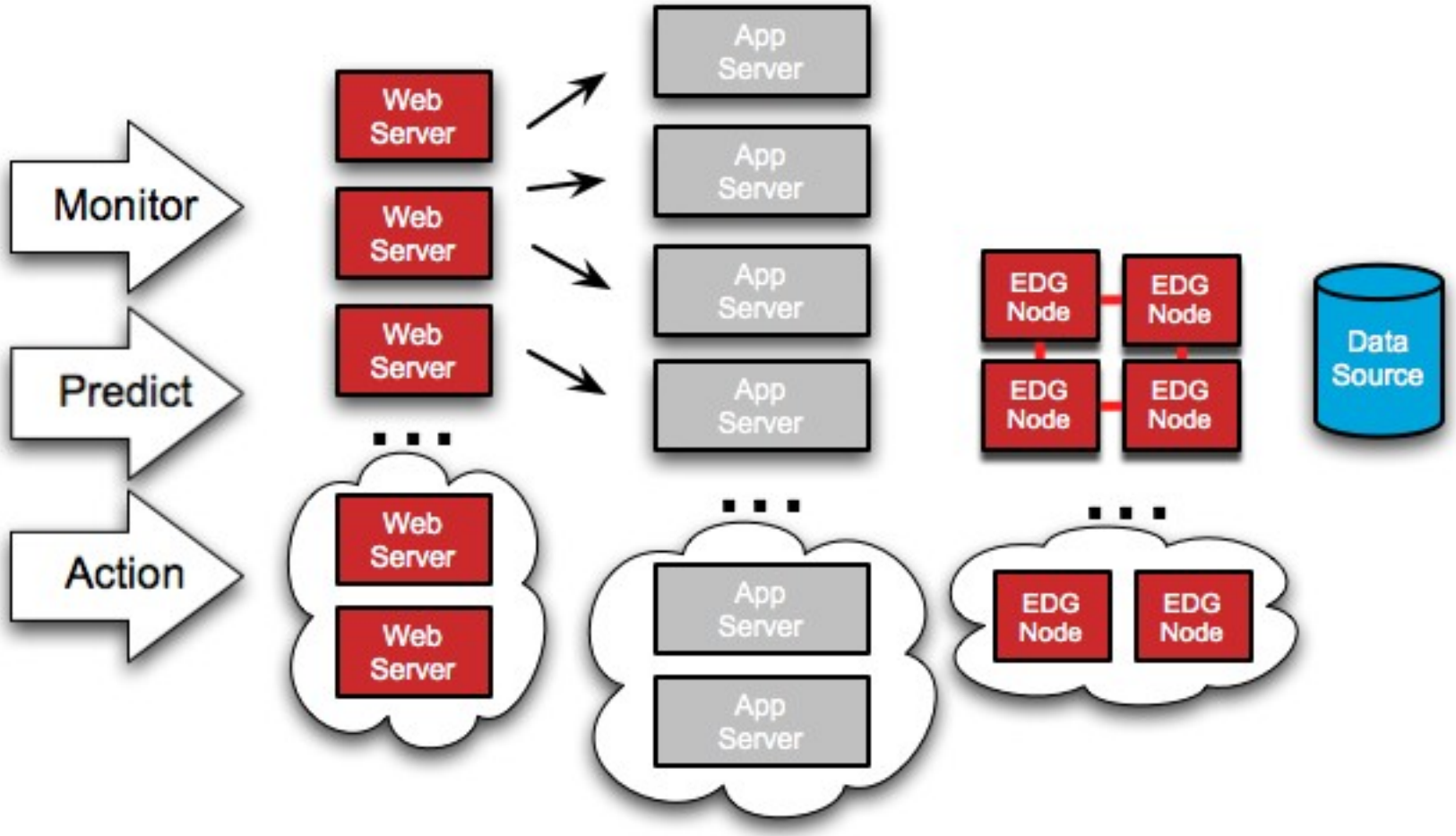
Scaling is hard



Or is it ?


Web Server
Web Server
Web Server
App Server
App Server
App Server
App Server
EDG Node
EDG Node
EDG Node
EDG Node
Data Source
Web Server
Web Server
App Server
App Server
EDG Node
EDG Node

Scaling is easy right ?



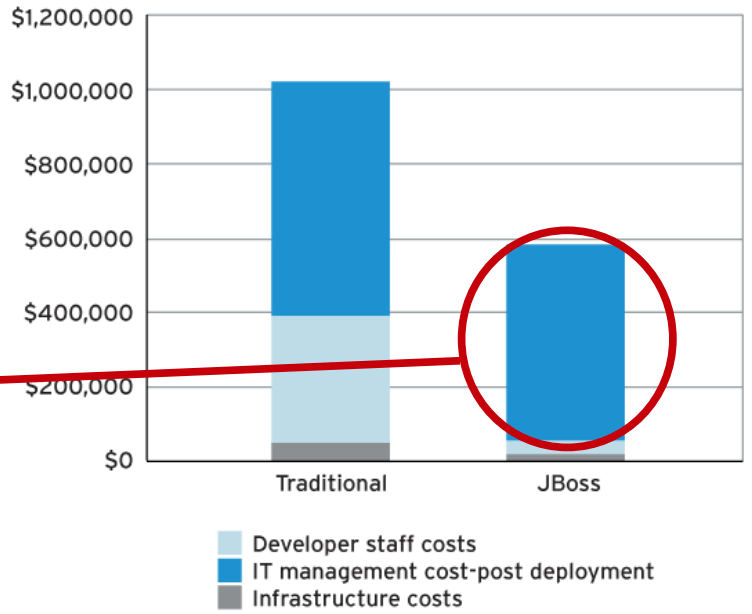
JBoss Enterprise Application Platform 6

Early Access

JBoss EAP 6 – 50,000ft view

- Most ambitious JBoss release ever
  - Major EE platform release (Java EE 6)
  - Significant OA&M changes
  - Documentation
  - Performance

Deliver substantially better value over the full application lifecycle



Java EE 6 – recap

- **Lighter**
  - Profiles, Pruning – JSR-77 & 88, EJB2, JAXR, JAX-RPC
  - Embedding – testing, batch
- **Better Integrated**
  - Managed Beans
  - CDI 1.0 - Unifies JSF, JPA, and EJB3
  - Bean Validation
- **Richer APIs**
  - JPA 2.0, EJB 3.1, JAX-RS 1.1
  - JSF 2.0 / Servlet 3.0

Java EE 6 – recap

- Simple POJO based programming
- Annotations instead of XML config. files
- Robust – 10 years old
- Standard – vendor and license choice

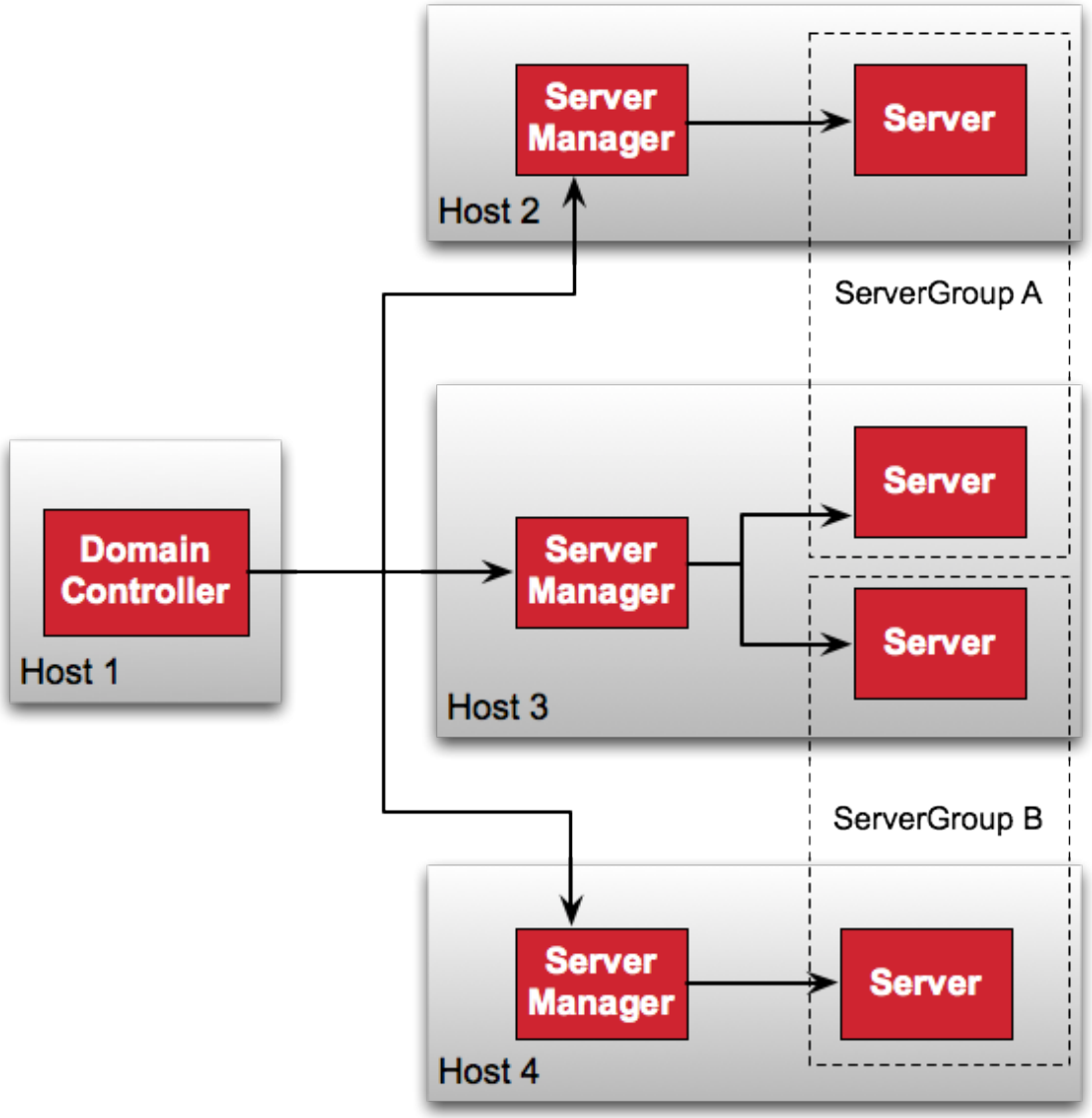
```
GET http://localhost/services/library/books
GET http://localhost/services/library/book/0120790629
DELETE http://localhost/services/library/book/0120790629
```

```
@Path("/library")
public class Library {
   @GET
   @Path("/books")
   public String getBooks() {…}

   @GET
   @Path("/book/{isbn}")
   public String getBook(@PathParam("isbn") String id) {}
```

EAP 6 Administrative Domain Model

- Domain
- DomainController
- Server
- ServerManager
- ServerGroup
- Cluster



Key Management Goals

- Stable, Remote Management API :
  - CLI, HTTP, Java API, Console
- Atomic multi-step operations
  - Across servers
  - With roll-back
- Config file simplification :
  - domain.xml – domain-wide configs
  - host.xml – server specific attributes / overrides

Other OA&M Improvements

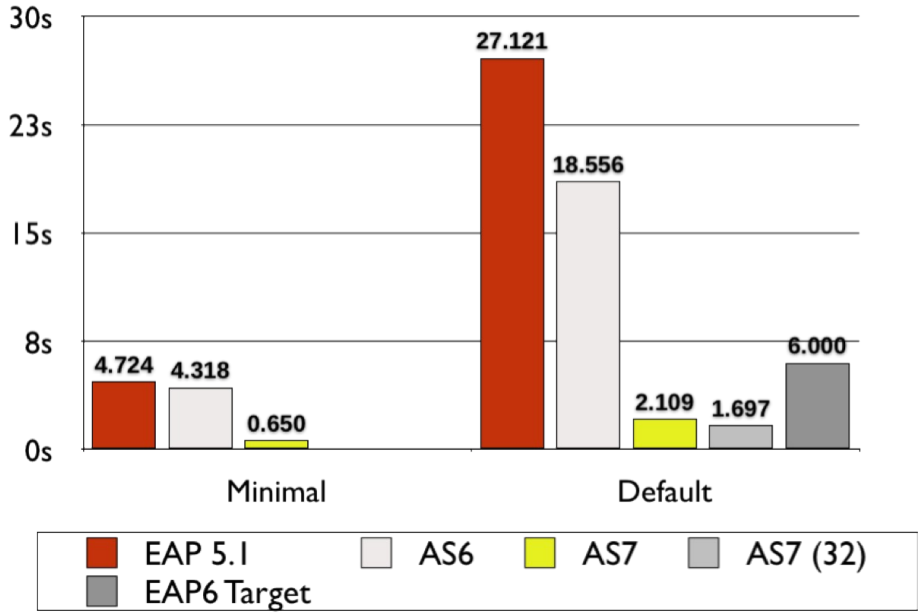
- True Modularity – JBoss Modules
  - Module definitions (public, private, deprecated, etc.)
  - Class-loader isolation
  - Extensible – eg. OSGi, Java SE 7
- User oriented configuration
  - Separation of config. from binaries and internal wiring
  - Radical simplification and harmonization
- Simplified port management
- IPv6 and mixed IPv4 / IPv6 support

Performance

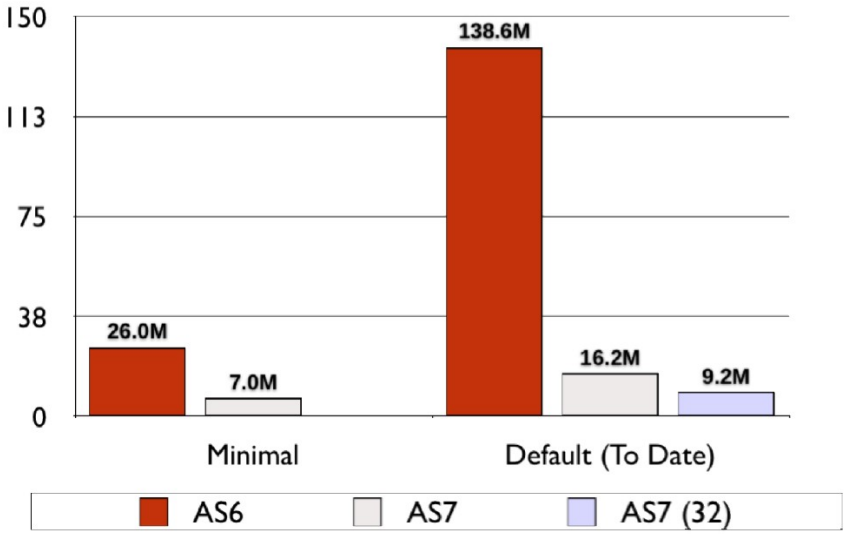
- Better multi-processor support
  - Lock-less concurrent class-loading
  - Concurrent service activation
  - Lazy service activation
- HornetQ Messaging
- Infinispan 2nd level cache, session replication
- Focus on benchmarking earlier in the lifecycle

Performance – Boot-time / Footprint

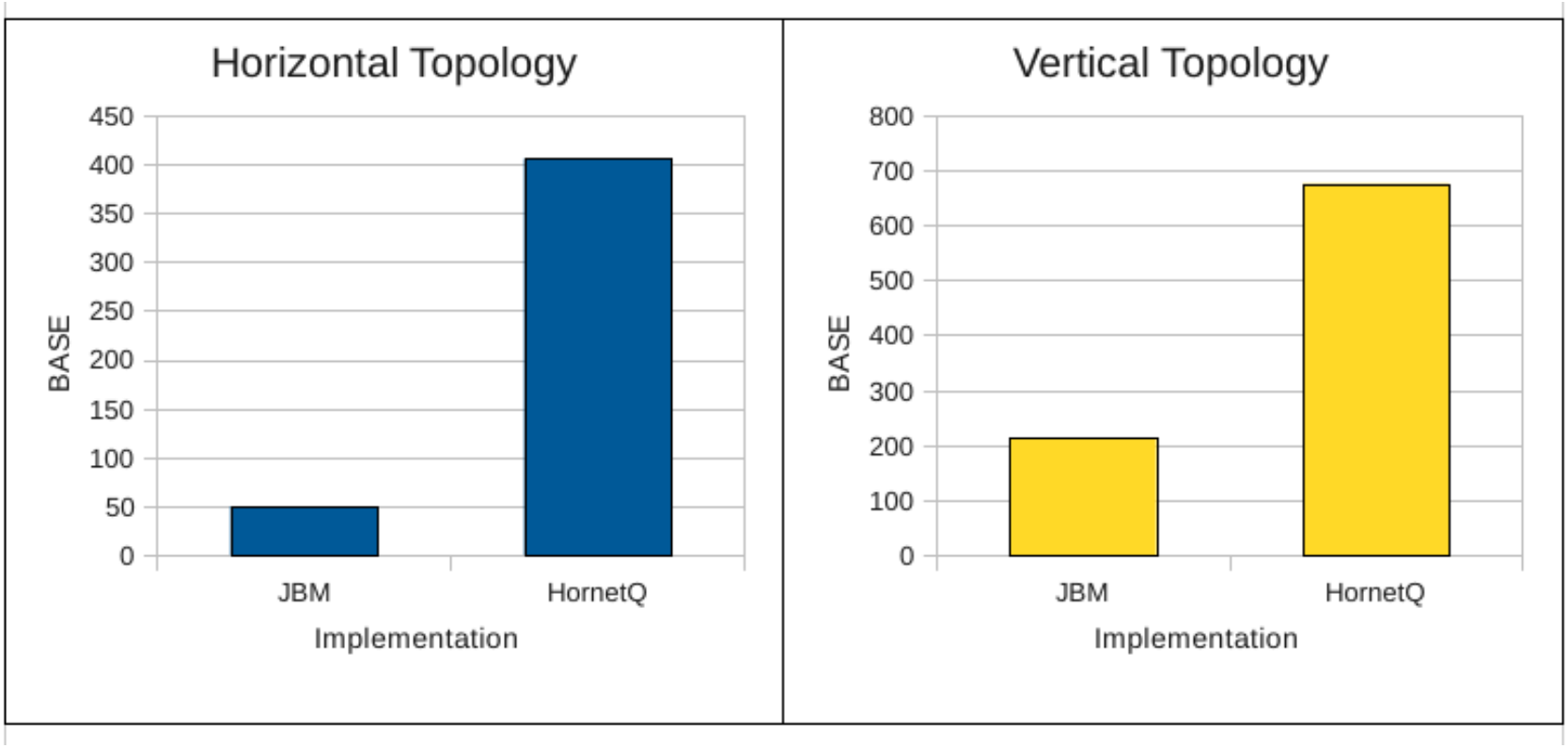
Cold Boot Time



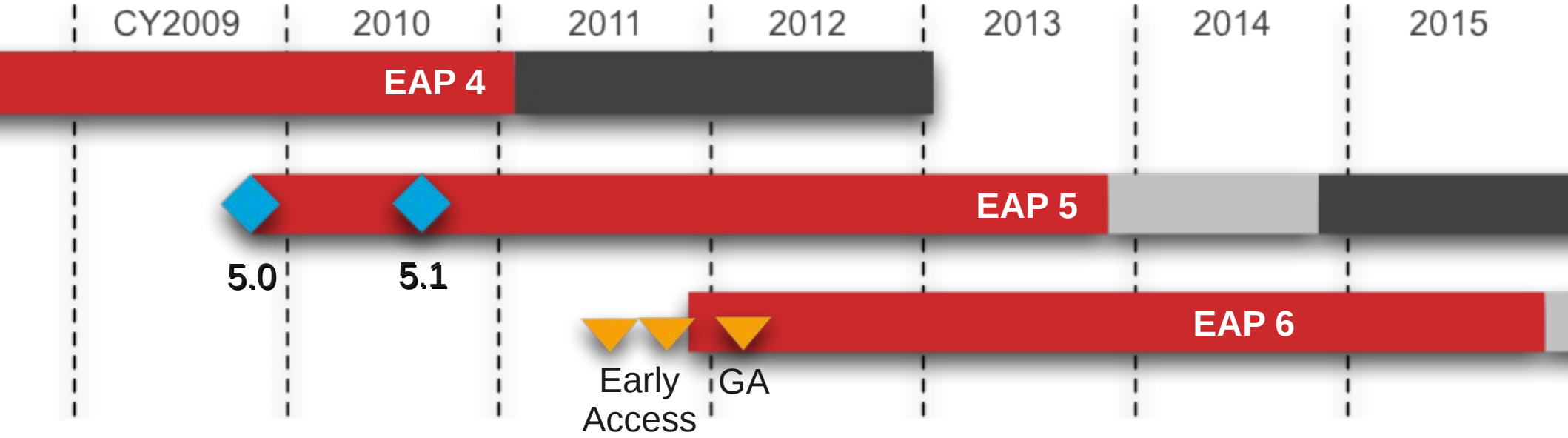
Cold Boot Memory



Performance : HornetQ vs JBM



JBoss EAP Roadmap



EAP 6.0 (Target : Start of CY12

- Java EE 6
- Hibernate 4.x ?
- Operational Ease of Use
- Domain Management
- Performance & Scalability
- Developer Productivity

What do you Want ?

Option 1 – Early delivery but only certified to Web Profile TCK. Would not include EJB 2, JSR 77, 88, JAX-RPC

Option 2 – Deliver later (eg. Feb 2012) – full EE 6 TCK and possibly Hibernate 4.

http://goo.gl/p8IoF

JBoss Enterprise Data Grid 6

Early Access

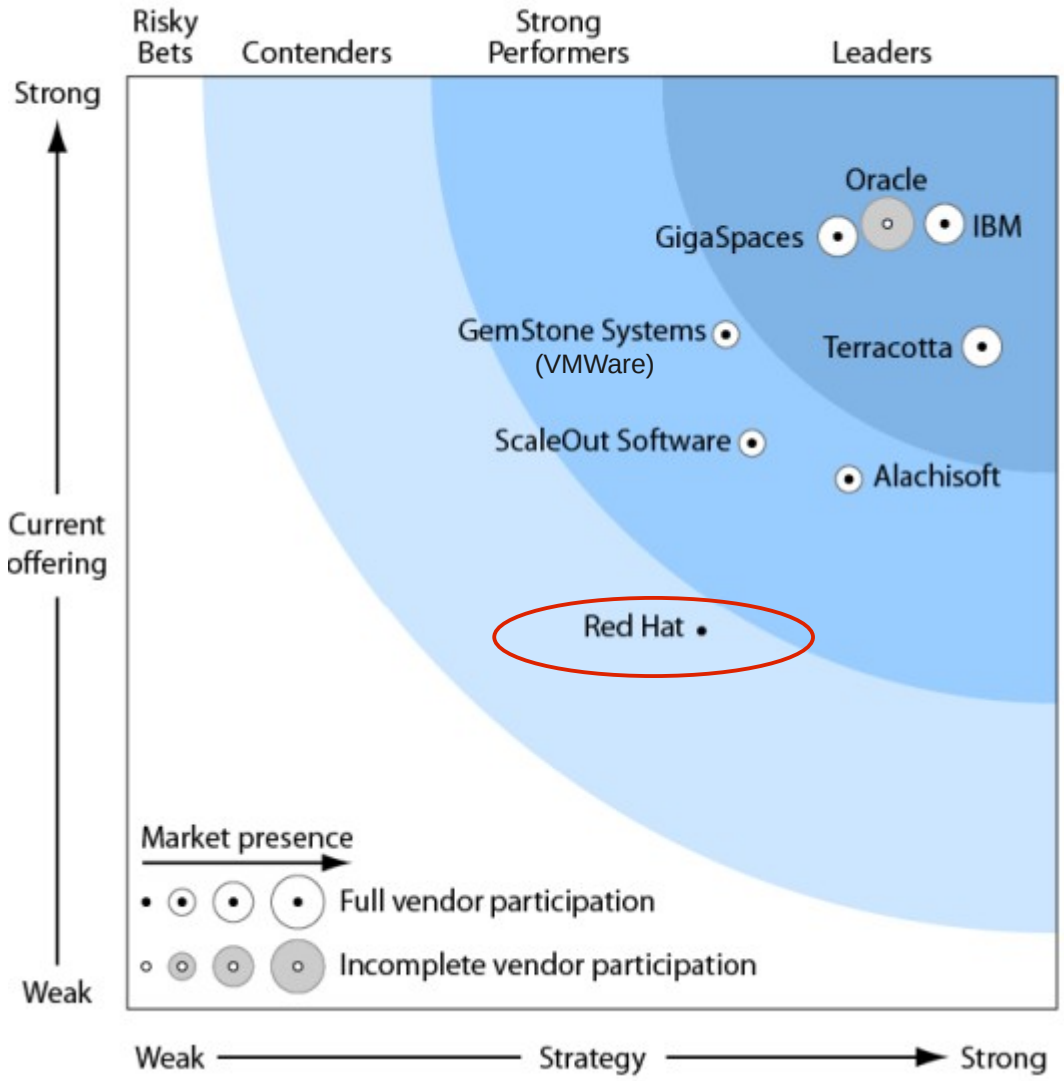
Market Background - The Data Explosion

- **Digital Data Growth : 2009 – 0.8 ZB* > 2020 – 35 ZB [1]**
- **Data Explosion driven by :**
  - Retail (we each leave a 50Gb data trail each year)
  - Web of Things (Smart Phones, Tablets, Smart Grids, Logistics, etc.)
  - PCI, FISMA, HIPPA, SOX, Basel II
- **Data access / analysis expectations growing**
  - real-time, on-demand
- **Coping Strategies**
  - Vertically scale – Mainframe, ExaData
  - Horizontally scale – RAC, Clustering
  - Innovation - Sharding, Columnar Storage, k-v stores, RAM not Disk

*1 Zettabyte = 10^{21} Bytes or 1 million Tbs
[1] IDC Digital Universe, May 2010

Data Caching Competitive Overview

Figure 4 Forrester Wave™: Elastic Caching Platforms, Q2 '10



"Red Hat's Infinispan is a Contender, and we expect a powerful one.

Infinispan is in a very early stage of commercialization, but Forrester expects it to gain lots of attention from Java developers and eventually build a position in the market as a strong alternative"

Source : Forrester Wave - ECP - Q2, 2010

What is Infinispan?

- **Open Source (LGPL) Data Grid**
- **Started in 2008, Java and Scala**
- **Evolution of JBoss Cache (started 2004)**
- **Some concepts from Amazon Dynamo**
- **Two usage modes**
  - Embedded
  - Client-server
    - memcached
    - Hot Rod
    - REST

What is Infinispan?

- **Consistent hash based distribution**
  - Self healing
  - No single point of failure
  - Fast and deterministic
- **Highly concurrent**
  - Lock and Synchronization free design
  - MVCC locking
- **XA Transaction Support**
  - 2-phase commit based
  - Deadlock detection algorithms

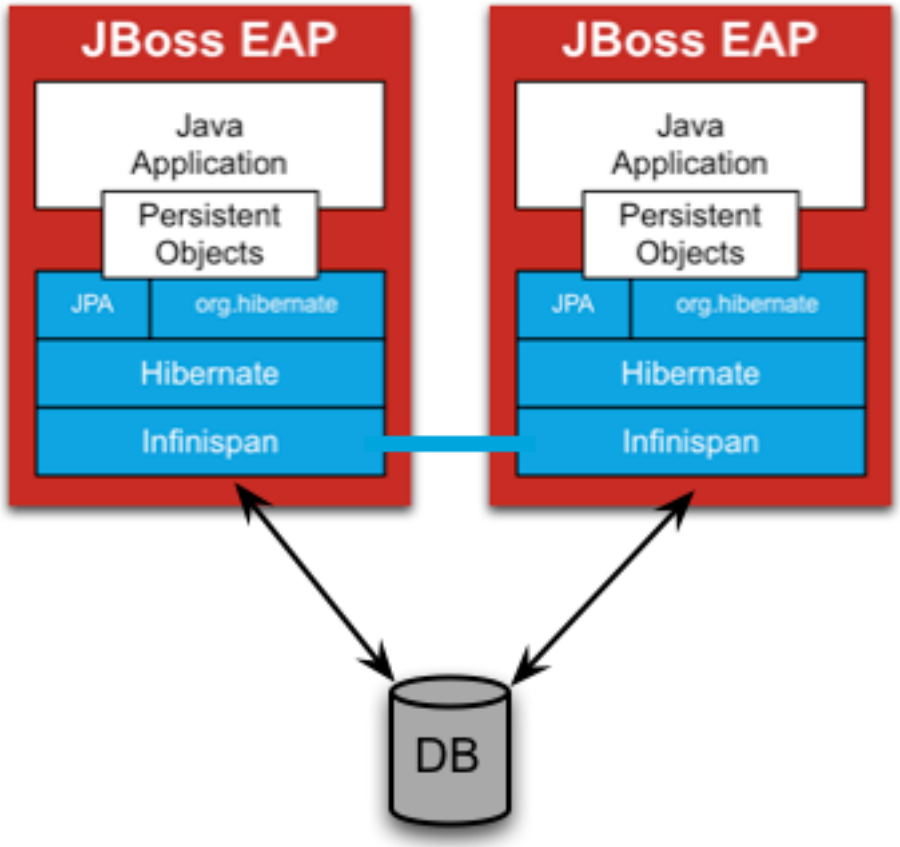
What is Infinispan?

- **Persistence**
  - Not just an in-memory store
  - Write through and write behind
  - Pluggable “drivers” (File, B-Tree, S3, etc.)
- **Eviction and expiry**
  - Efficient, adaptive algorithms
  - Addresses shortcomings of LRU & FIFO

What is Infinispan ?

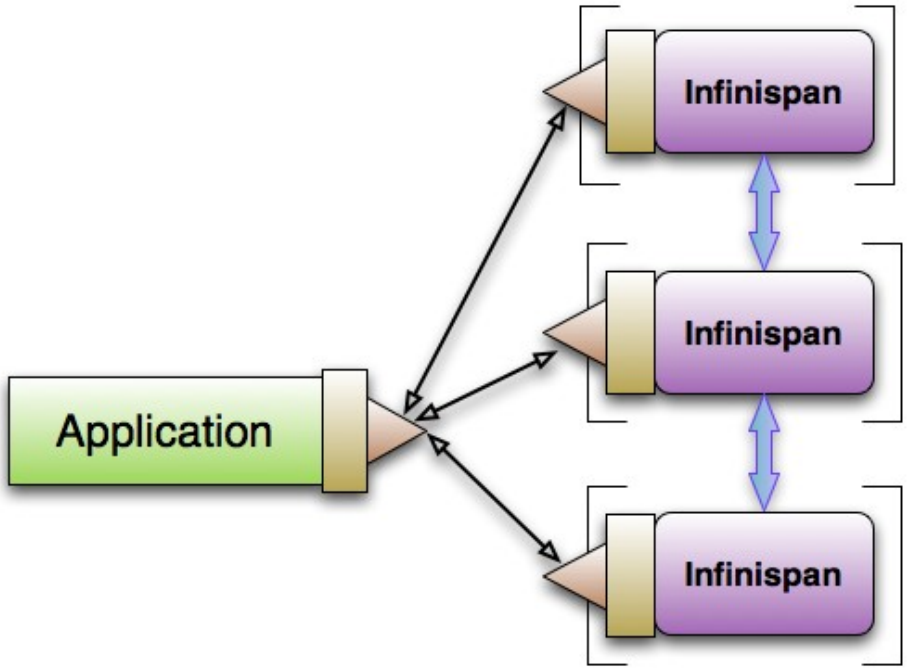
- **APIs**
  - Map-like key-value store
  - JSR-107 Support
  - Upcoming JPA-like layer
  - Other high-level APIs being considered e.g., ActiveRecord

Embedded



- **eg. embedded in EAP**
  - Hibernate 2nd Level Cache
  - EJB and Servlet session replication
  - Map-like API / JSR-107
  - EAP 4 / 5 used JBoss Cache 2 / 3
  - EAP 6 will use Infinispan 5.0
- **Can also be embedded in a JVM – doesn't require EE**

Client / Server

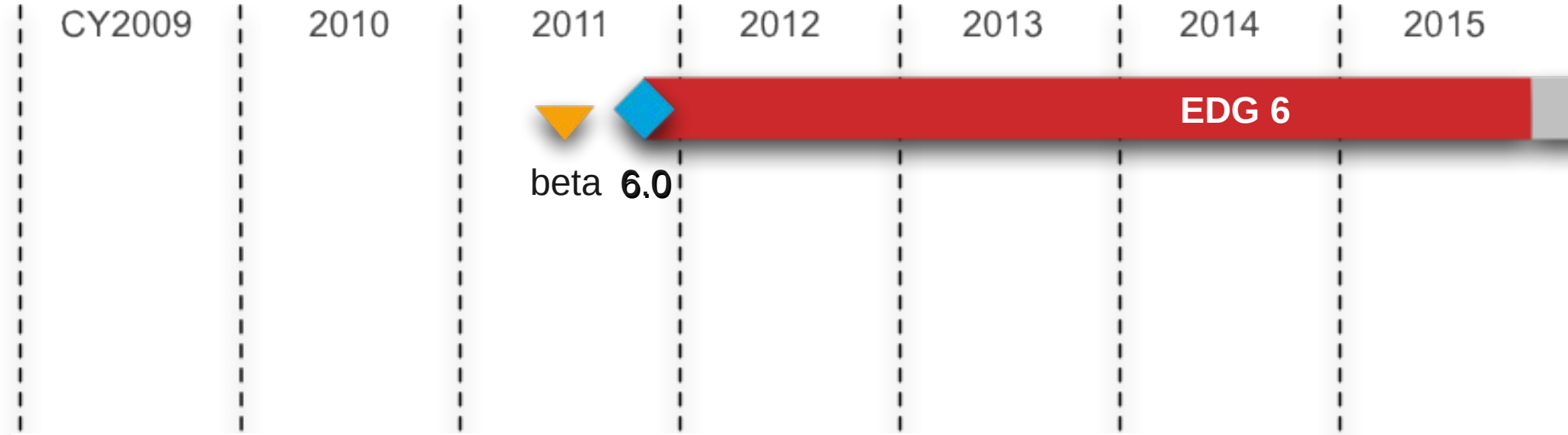


- **Supported Protocols**
  - REST
  - Memcached
  - HotRod
    - Wire protocol
    - Smart routing
    - Failover / Load balancing

Server end-point comparison

	Protocol	Client Libraries	Clustered ?	Smart Routing	Load Balancing/ Failover
REST	**Text**	N/A	**Yes**	**No**	Any HTTP load balancer
Memcached	**Text**	Plenty	**Yes**	**No**	Only with predefined server list
Hot Rod	**Binary**	Currently only Java	**Yes**	**Yes**	Dynamic

JBoss Enterprise Data Grid



EDG 6.0 (Target : Q4 CY2011)

- Based on Infinispan 5.0
- Java, Memcached, HotRod and REST APIs
- Write-through, write-behind to persistent storage
- Consistent hash-based data distribution
- Sophisticated eviction strategies
- Code-execution framework

Sign up for Early Access :

EAP 6 : http://goo.gl/WZlS9

EDG 6 : http://goo.gl/fzlv9

Java EE 6 Survey :

http://goo.gl/p8IoF

Thirsty for more ?

Wednesday

2.00-3.00pm - Highly Scalable Data Grids with Infinispan

3.10-4.10pm – Introduction to CDI

4.20-5.30pm - Configuration and Management with JBoss Application Server 7

5.30-6.30pm - JBoss Enterprise Application Platform BoF

Thursday

10.20-11.20am – Cloudy Middleware

11.30-12.30pm - JBoss Operations & Management in the Cloud

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