

Innovative Elastic Caching Solutions

New!



DataPower XC10 Appliance

- Drop-in cache solution optimized and hardened for data oriented scenarios
- High density, low footprint improves datacenter efficiency

“Data Oriented”

- Session management
- Elastic DynaCache
- Web side cache
- Worldwide cache
- Data buffer
- Event Processing
- Petabyte analytics
- In-memory OLTP
- In-memory SOA

“Application Oriented”

WebSphere software

eXtreme Scale

- Ultimate flexibility across a broad range of caching scenarios
- In-memory capabilities for application oriented scenarios

Elastic caching for linear scalability

High availability data replication

Simplified management, monitoring and administration



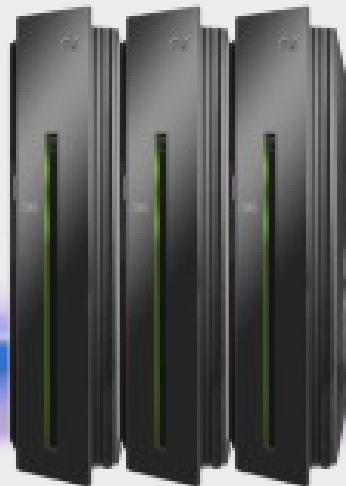
Modern Application Infrastructure Topology

Web Server Tier

App Server Tier

Elastic Data Grid

Database Tier



1



DataPower XC10 for simple data oriented scenarios:

- HTTP Session Replication
- Elastic Dynacache
- Web Side Cache



WebSphere software

IBM HTTP Server

WebSphere Application Server

2

WebSphere software

eXtreme Scale for maximum flexibility covering data and application oriented scenarios

Information Management

DB2 UDB



Introducing IBM WebSphere DataPower XC10 Appliance

New!

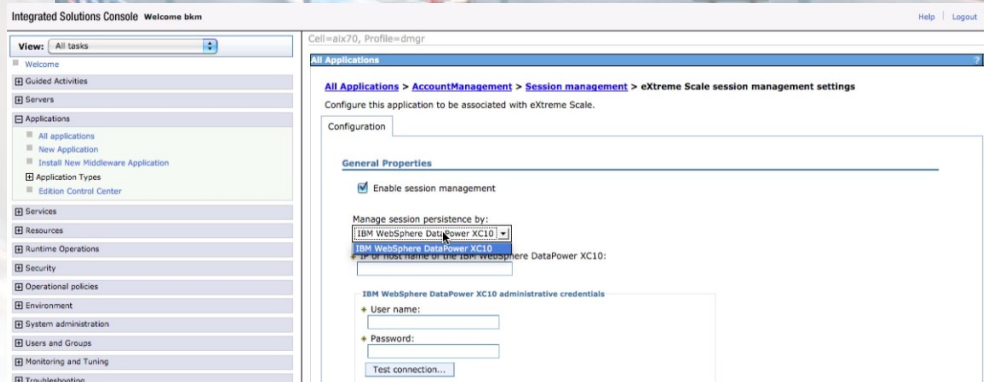
Easy drop in use for common scenarios

- Support for **data-oriented caching scenarios** without rip & replace
- Scale out with ease
 - **Large, elastic cache** allows you to scale more economically while providing high Quality of Service
- Fault tolerance
 - Lower risk of data loss while providing **continuous availability**
- Flexible and simple user management
 - Simple solution for **real world management and monitoring**



Easy drop-in use for common scenarios

- HTTP Session Management
- WAS Dynamic Cache Service (“Dynacache”) support
- Web Side Cache



Little or no code changes required!

“Get Started” page links for data caches

Get Started
Configuring the IBM WebSphere DataPower XC10

With IBM WebSphere DataPower XC10, your applications can use fast, simple and elastic data caching in a variety of scenarios. Ensure your appliance administrator has configured the appliance before proceeding with any caching scenarios.

Step 1: Set up the appliance
Customize the appliance settings. Create users and groups

Step 2: Create an appliance collective for high availability
Form a collective by adding another single appliance to the configuration. Add to the collective by assimilating additional appliances.
[Add appliances to this collective](#)
[More information](#)

Data Cache

- Simple Cache
- Dynamic Cache
- Session

Scenario 2: Session management
IBM WebSphere DataPower XC10 can be used for storing HTTP application session information by creating session data caches.
[More information](#)

Scenario 3: Dynamic cache provider
If you are not using HTTP session APIs then you can cache your application information with Dynamic Cache. The Dynamic Cache service attempts to provide performance benefits for retrieving data that may otherwise be expensive to get.
[More information](#)

Create a simple data cache
Create a general use data cache for storing strings or objects.
[Create a simple data cache](#)

Automatically create a session data cache during application install
Session data caches are created automatically by specifying that session is managed by IBM WebSphere DataPower XC10, during application installation using the WebSphere Application Server console.

Create a session data cache from the appliance console
Alternatively, use the appliance console to manually create a session data cache. You must associate the cache with an application later, by specifying an existing data cache name during application installation.
[Manually create session data cache](#)

Automatically create a dynamic cache data cache during configuration
Create dynamic cache data caches automatically by selecting IBM WebSphere DataPower XC10 as the cache manager in the configuration of the dynamic cache in the WebSphere Application Server administrative console.

Create a dynamic cache data cache from the appliance console
Alternatively, use the appliance console to manually create a dynamic cache data cache. You must associate the cache with an application later, by specifying an existing data cache name during dynamic cache configuration.
[Manually create dynamic cache data cache](#)



Offloaded session management for HTTP requests

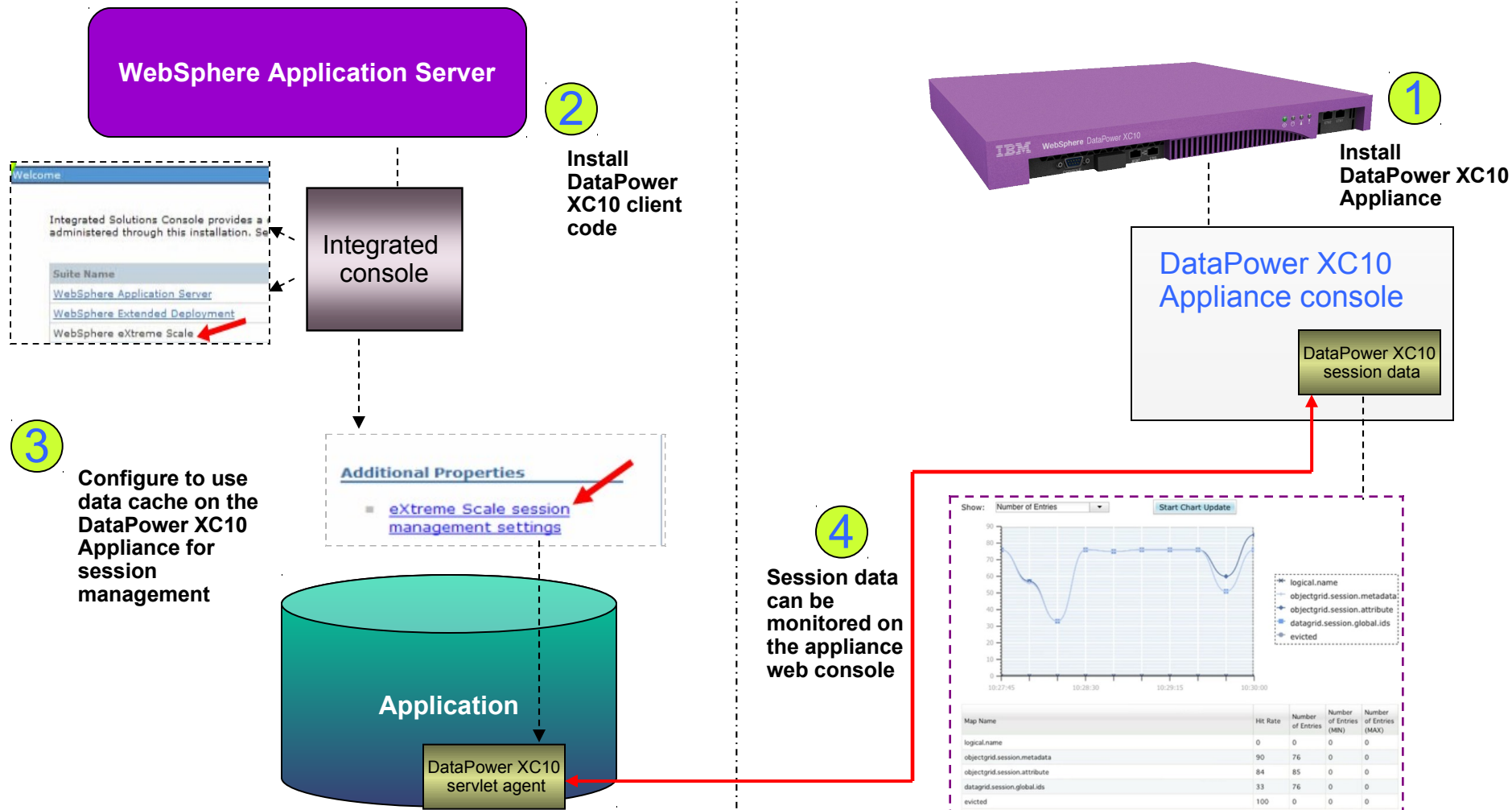
- WebSphere Application Server connects seamlessly to the DataPower XC10 appliance
 - Client code must be installed on WebSphere Application Server systems
- Easily configure WebSphere applications to store HTTP session data to a data cache on the DataPower XC10 appliance through the WebSphere Application Server administrative console
- Replaces other session replication mechanisms



End-to-end Session Management Scenario

WebSphere Application Server side

DataPower XC10 appliance side



Dynamic Cache service support

- DataPower XC10 provides client code and a plug-in for WebSphere Application Server applications to support DynaCache API
- Allows applications deployed to WebSphere servers to use DataPower XC10 as a “drop-in” cache, instead of storing cache data in local memory or multiple instances of a disk cache



Web Side Cache

- Used to store data for fast, lower-cost access than a database
- Uses ObjectMap APIs from WebSphere eXtreme Scale
- Every time data is needed, the web side cache on the DataPower XC10 Appliance is checked first
- If the value is not found (cache miss), then the data is retrieved from the backend database and inserted into the cache
- Client can run in a standard Java EE compliant server environment or in any Java Virtual Machine compliant with Java SE V1.4 or beyond



Scale out with Ease

- **160 GB** elastic cache for your business-critical applications
- Scales **elastically** without application downtime
- Linear, **predictable** scaling at predictable cost
- Quickly and easily increase cache capacity as needs grow
- Unbinds cache from application server memory constraints



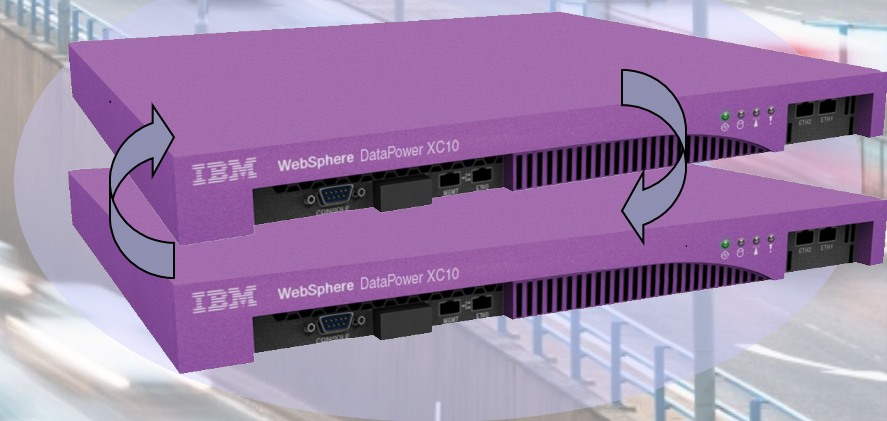
Form “Collectives” of XC10 Appliances

- Collectives are a set of appliances which know about each other
- Allows for failover recovery if one of the appliances in the collective fails
- Default collective contains the appliance where you logged on
 - Add additional appliances using the console interface
- Add additional appliance by supplying:
 - Host name or IP address of the appliance to be added
 - Secret key of the appliance to be added
- Adding one appliance to collective that contains only 1 appliance:
 - Provides failover capability because 2nd appliance automatically gets replica of **all** data



Fault Tolerance

- Create an appliance “collective” for high availability
- Lowers risk of data loss through automatic replication of data
- Continuous Availability!
- Self Healing - Failures are automatically detected
- Easy to configure



Replication

- Collective replicates data between members
- Replication provides a backup of primary cache data
- Replicas act as drones
 - They are completely slaved to the primary
 - Modifications can only be made using the primary
- The replication mechanism uses a check-pointing technique to bring replicas up to date as fast as possible with minimum disruption to work occurring on the primary
- Synchronous replication
 - Data is replicated before transaction completes
 - Highly reliable
 - Can cause performance bottleneck.
- Asynchronous replication
 - Allows the transaction to complete before the data is replicated, providing greater speed than synchronous replication



Built-in console for management and administration

IBM WebSphere DataPower ...
Welcome, Administrator

Home
Data Cache ▾
Monitor ▾
Collective ▾
Tasks
Appliance ▾
Profile


Get Started

How to set up the appliance

Configuring the IBM WebSphere DataPower XC10


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Step 1: Set up the appliance

 Customize the appliance settings. Create users and groups and assign permissions to them.

[Customize settings](#) | [Create users](#)

Step 2: Create an appliance collective (Optional)

 Form a collective by adding another single appliance to the configuration. Add to the collective by assimilating additional appliances.

[Add appliances to this collective](#)

Get Caching

scenarios for caching

Enabling applications to leverage IBM WebSphere DataPower XC10


Applications can quickly begin to exploit the caching services of the IBM WebSphere DataPower XC10 through one of three supported caching scenarios.

Scenario 1: Simple data cache

You can use a generic data cache intended to speed up dynamic Web applications by alleviating database load. Key-value pairs of arbitrary data are stored in-memory.

Create a simple data cache

Create a general use data cache for storing strings or objects.


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Scenario 2: Session management

IBM WebSphere DataPower XC10 can be used for storing HTTP application session information by creating session data caches.

Create a session data cache

You can manually create session data cache in the appliance console and associate it with an application later. You can create session data caches automatically by specifying that sessions are managed by IBM WebSphere DataPower XC10 , during application installation using the WebSphere Application Server console.


 [Manually create session data cache](#)

Scenario 3: Dynamic cache provider

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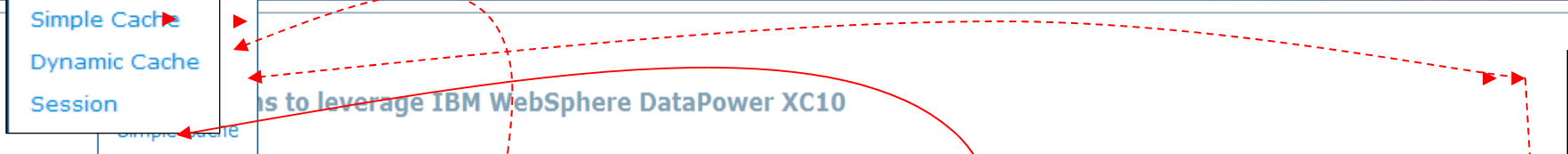
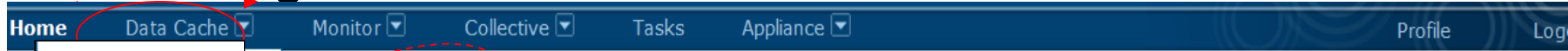
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Start Caching



Applications can quickly begin to exploit the caching services of the IBM WebSphere DataPower XC10 through one of three supported caching scenarios.

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Manually create dynamic cache data cache



Monitoring

Monitor settings:

- Allow users to monitor load for an application connected to the DataPower XC10 appliance

- Three view options available:
 - Data grid overview
 - Individual data grid overview
 - Data grid detail reports



IBM WebSphere DataPower XC10 Appliance

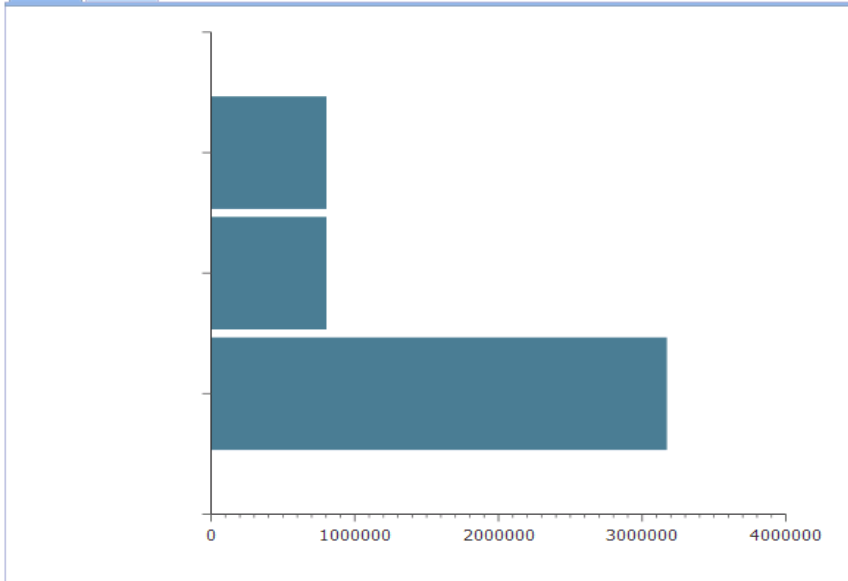
Current Data Cache Used Capacity Distribution

in Bytes



Top Used Capacity Consumers:

Chart Table



Used Capacity Over Time

Top 5 Data Caches

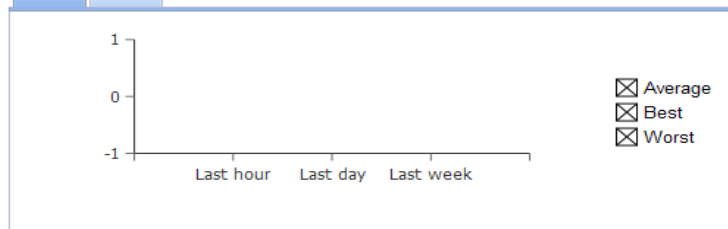
by Average Transaction Time in milliseconds

Data Caches	Current	Data over last 466 min	[Min Max Avg]
JoesSession.session	.00		[.00 3.39 .02]
user2SessionCache.session	.00		[.00 3.39 .02]
mjs.session	.00		[.00 1.60 .03]

Average Throughput Over Time

in transactions/second

Chart Table



Top 5 Data Caches

by Average Throughput in transactions/second

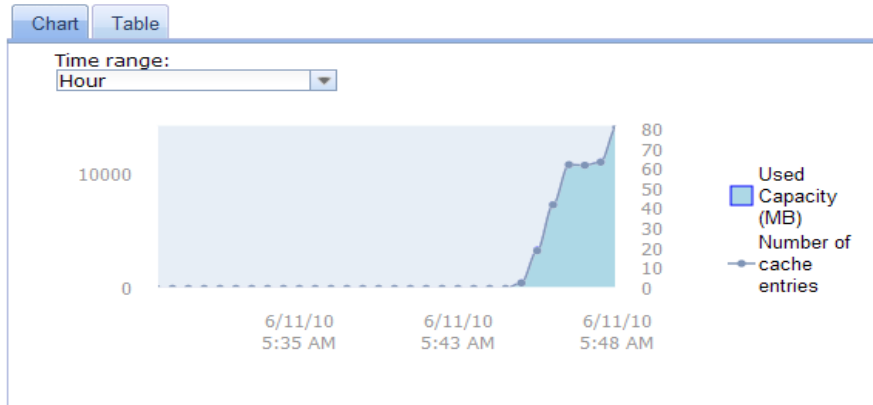
Data Caches	Current	Data over last 466 min	[Min Max Avg]
JoesSession.session	.00		[.00 12.94 .38]



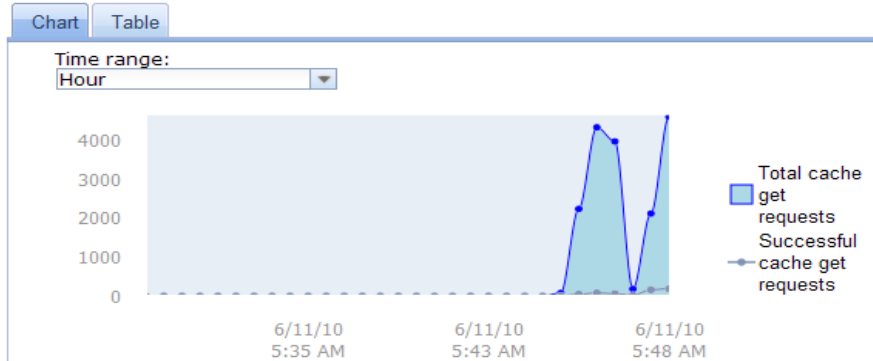
Monitoring Individual data grids

Number of cache entries: 14220 Average Transaction Time (milliseconds): 64.37 Average Throughput (transactions/second): 17.30

Used Capacity (MB) vs. Number of cache entries



Total cache get requests vs. Successful cache get requests



Data grid detail view

Current summary

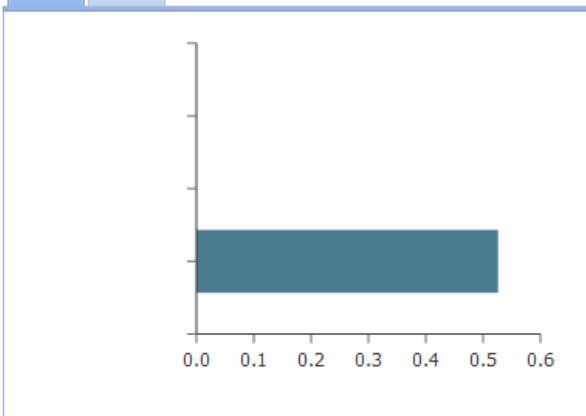
Used Capacity (MB): 537.42 Zones: 9.3.75.209

Current eXtreme Scale Object Grid Map Used Capacity Distribution in GigaBytes



Top Used Capacity Consumers:

Chart Table



Current summary

Used Capacity (B): 0.00

Number of cache entries: 0

Average Throughput (transactions/second): 27.23

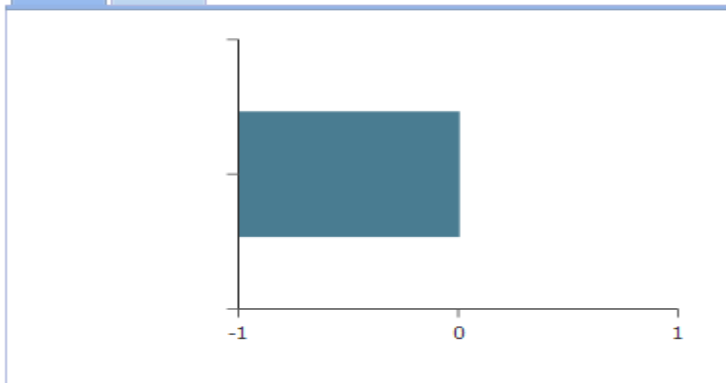
Average Transaction Time (milliseconds): 40.24

Current Partition Used Capacity Distribution in GigaBytes



Top Used Capacity Consumers:

Chart Table



Summary

- **Accelerated Time to Value**

- *Reduces the time necessary for install, setup and configuration through out-of-the-box, 'drop-in' use for simple side cache scenarios, HTTP Session replication and WebSphere Application Server dynamic cache service*

- **Simplified management and administration**

- *Offers a built-in, simplified administration and monitoring console to enable efficient setup, configuration, and management of the appliance and transaction load within your datacenter*

- **Ensures high availability of data for mission-critical applications**

- **Scales with simplicity**

- **Delivers high performance and consistent response times**



Learn More

- XC10 Web Site

<http://www-01.ibm.com/software/webservers/appserv/xc10/>

- Getting Started Wiki - eXtreme Scale and XC10

ftp://ftp.software.ibm.com/common/ssi/pm/sp/n/wsd14072usen/WSD14072USEN_HR.PDF <http://www.youtube.com/user/ibmextreme>

- Announcement Letter

http://www-01.ibm.com/common/ssi/ShowDoc.jsp?docURL=/common/ssi/rep_ca/8/897/ENUS110-102

Additional resources

Weekly video podcasts covering customers questions and forum posts on the IBM WebSphere eXtreme Scale product.



developerWorks.

WebSphere Extreme Transaction Processing for Developers Space will discuss various topics for developing and deploying XTP applications and will point out emerging trends, benefits, challenges, and features associated with it.

<http://www.ibm.com/developerworks/spaces/xt>



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WebSphere. software