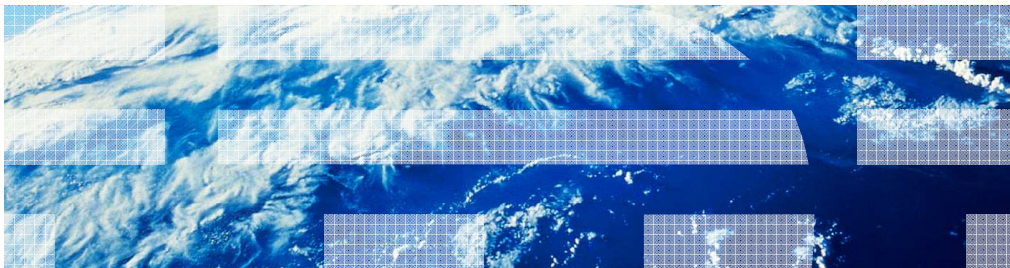


IBM WebSphere DataPower XC10 V2.0

WebSphere Commerce integration



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This presentation will discuss the IBM WebSphere DataPower XC10 V2.0 and how it can be used for dynamic caching for IBM WebSphere Commerce.

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- Summary

This presentation will provide a summary of the access and resource requirements. The summary of the installation and configuration steps includes installing the WebSphere eXtreme Scale client and configuring the WebSphere Commerce cell for caching. Finally you will test your application and look in the DataPower XC10 administrative console to see the graph of the caching activity. This presentation then concludes with a summary of the topics.



Section

Why use XC10 with WebSphere Commerce

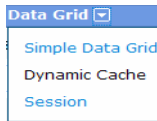
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XC10 integration with WebSphere Commerce

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This section discusses how WebSphere Commerce can use the WebSphere DataPower XC10 caching appliance and some of the benefits of doing so.

Dynamic cache overview



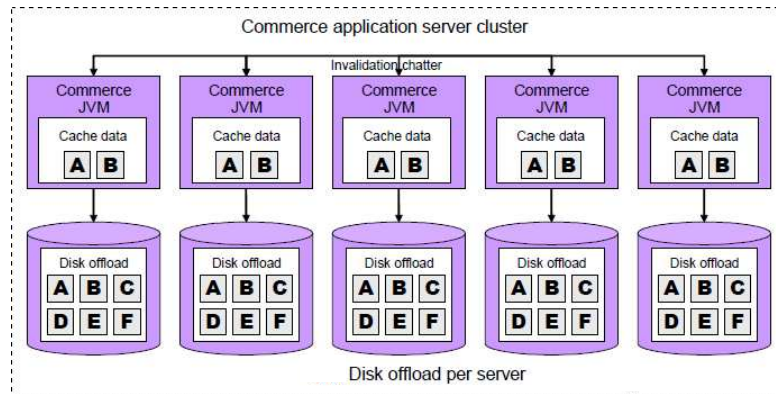
- DataPower XC10 provides a plug-in for WebSphere Application Server to support DynaCache API requests to the appliance
- WebSphere Commerce uses DynaCache extensively
 - Can use the DynaCache APIs to use DataPower XC10 as a cache
 - Instead of storing cache data in local memory or disk cache
- Activated by configuring WebSphere Application Server for the DataPower XC10 appliance
 - Does not require code changes
 - Similar to IBM WebSphere eXtreme Scale V7.0 configuration for dynacache implementation

You can use the IBM WebSphere DataPower XC10 appliance to store data from your WebSphere Application Server dynamic cache instead of caching the data in local memory. By setting up this capability, you can enable applications that are written with the Dynamic Cache API or applications using container-level caching, such as servlets, to use the features and performance capabilities of the appliance

IBM provides the necessary client code to allow applications to access dynamic cache data on the DataPower XC10 appliance. The DataPower XC10 client adds additional dynamic cache configuration options to the WebSphere administrative console.

Using the DataPower XC10 dynamic cache requires a few simple configuration changes; your deployed code does not need to change.

WebSphere dynamic cache provider



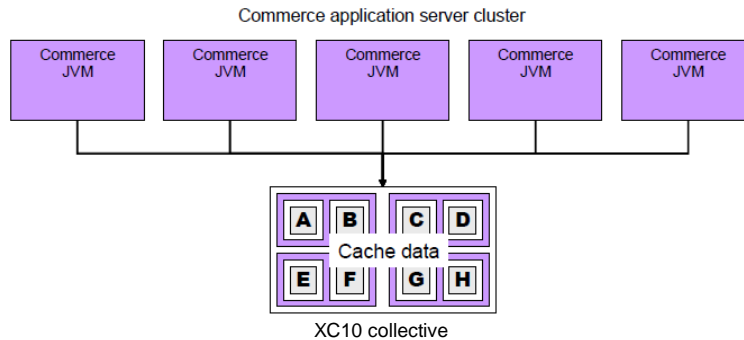
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XC10 integration with WebSphere Commerce

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This diagram illustrates the default WebSphere dynamic cache provider. The top row represents a WebSphere Commerce application server cluster consisting of WebSphere Commerce Java virtual machines. Notice that each JVM contains a separate copy of cached data. When the in-memory cache in a JVM reaches its capacity, the dynamic cache provider can optionally use its disk offload feature to write cached entries to local disk storage as illustrated by the bottom row.

XC10 Dynamic cache provider



- Much larger cache capacity
- WebSphere Commerce JVMs run more efficiently
 - Lower local memory requirements
- Improved consistency of performance
 - Improved cache and environment stability
 - High availability of cached data

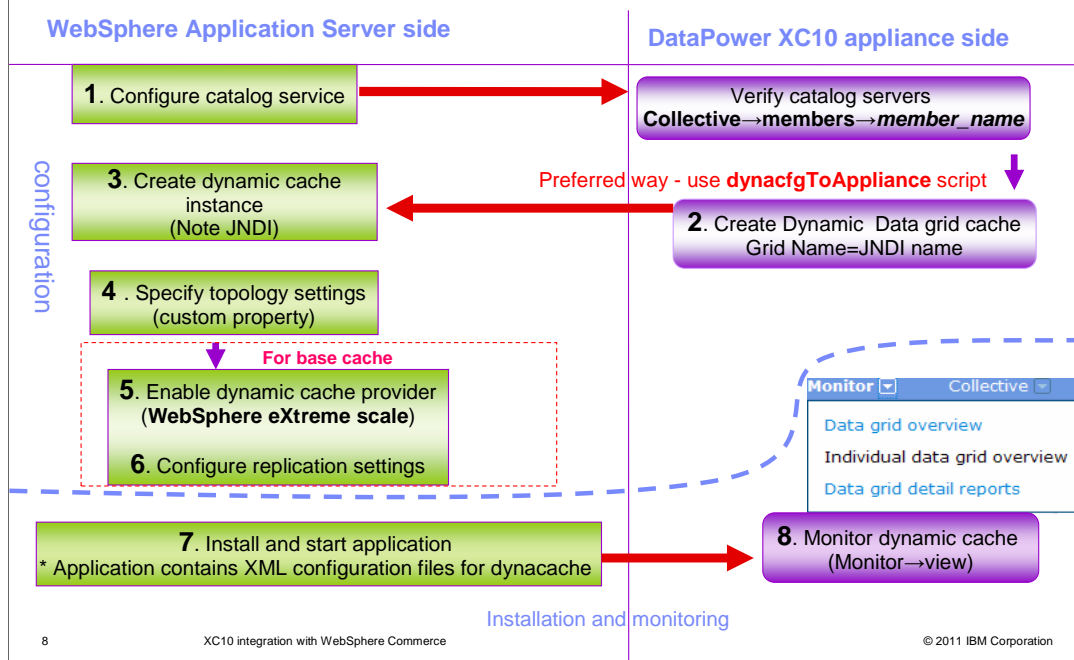
The XC10 dynamic cache provider uses a slightly different architecture. As on the previous slide, the top row represents a WebSphere Commerce application server cluster, but this time connected to a DataPower XC10 collective. As a reminder, a collective consists of one or more XC10 appliances. Notice that all of the cached data is stored on the DataPower XC10 collective.

This setup allows for lower local memory requirements, enabling the WebSphere Commerce JVMs to run more efficiently. Since all data is cached in the collective, individual WebSphere Commerce JVMs are less likely to have “stale” data, and do not have to call back-end systems that generate the data as often, reducing load. This setup also allows for high availability of cache data and improved performance.

Installation and configuration overview

This section will discuss the installation and configuration steps needed for integration.

End-to-end scenario: Configuring Dynamic cache



To use the DataPower XC10 from WebSphere Commerce, you must first install the WebSphere eXtreme Scale client as an extension to your WebSphere Commerce installation. After installing the client, you must configure a catalog service domain through the WebSphere Application Server administrative console.

Once you have created your catalog service domain, you create dynamic cache data grids on the DataPower XC10 appliance and corresponding a dynamic cache instances on WebSphere Application Server.

If you require a default cache instance, or baseCache, configure WebSphere eXtreme scale as the default dynamic cache provider on each managed server instance.

When all the configuration steps are complete, you are ready to install your dynacache-ready application. As a reminder, “dynacache-ready” means that the application includes xml configuration files specifying how it uses dynamic caching.

Finally, you can monitor the cache on the XC10 appliance console using the monitoring menus.

Summary of installation and configuration steps

- Install required level of WebSphere eXtreme Scale client
 - Over WebSphere Commerce
- Configure WebSphere Commerce
 - Catalog service domain
 - Create dynamic cache data grids
 - Create and configure dynamic cache instances
 - Servlet cache
 - Object cache
 - basecache
 - Enable servlet caching
 - Configure topology settings
 - Enable dynamic cache provider and replication settings
 - Set custom properties
- Configure WebSphere Commerce applications for caching
- Test application and observe caching

This slide shows a more detailed listing of the steps necessary to configure your WebSphere Commerce system to integrate with the DataPower XC10 caching appliance. These steps are discussed in more detail in the DataPower XC10 presentation “Dynamic data caches” in the IBM education assistant.

Where to place caches

Data cache type	Best cache environment
<i>baseCache</i> This is the default servlet cache. Assume all web content fits into this category	WebSphere DataPower XC10
<i>Servlet caching</i> If a specific cache name is used for web content	WebSphere DataPower XC10
<i>Command caching</i> Responses from expensive business logic methods	WebSphere DataPower XC10
<i>Object caches</i> (for DistributedMap data)	Default dynamic cache provider

- WebSphere Commerce assumes all data is local
 - Frequently accesses certain types of data
 - Such as user data
 - XC10 can affect performance for this data
 - Continue to use default provider

This slide shows suggested environments for different cache types used by WebSphere Commerce. “baseCache”, which is the default servlet cache, should be configured on the WebSphere DataPower XC10. Similarly, command caching is also available on WebSphere DataPower XC10.

WebSphere Commerce assumes all data is local, so it makes frequent access to certain types of data, such as user data. Caching these small but frequently accessed pieces of data on the DataPower XC10 can impact performance, so object caches for distributed map data should be configured to use WebSphere’s default dynamic cache provider.

Section

Testing WebSphere Commerce caching

This section will show you how you can test WebSphere Commerce caching.



SystemOut.log using XC10 provider

[10/25/10 8:46:08:538 CDT] 00000000 CacheProvider I CWOBJ4500I: WebSphere eXtreme Scale Dynamic Cache provider is successfully initialized.

[10/25/10 8:46:09:913 CDT] 00000000 ObjectGridImp I CWOBJ4700I: The map name IBM_DC_PARTITIONED_baseCache matched the regular expression of template map IBM_DC_PARTITIONED_*. **The IBM_DC_PARTITIONED_baseCache map has been created for ObjectGrid DYNACACHE_REMOTE.**

[10/25/10 8:46:09:991 CDT] 00000000 CacheProvider I CWOBJ4508I: **The WebSphere eXtreme Scale provider has created a Dynamic Cache instance with name baseCache using topology remote.**

Once your WebSphere Commerce system has been configured to use the DataPower XC10 for dynamic caching, you can ensure the setup is correct by looking at your SystemOut.log. Look for entries in the log that indicate the eXtreme Scale provider created the baseCache with remote topology.

SystemOut.log using default provider

```
[11/26/10 14:32:37:324 CST] 00000000 CacheProvider E CWOBJ4501E: The WebSphere eXtreme Scale Dynamic Cache provider encountered an error while creating the cache instance: baseCache.
[11/26/10 14:32:37:449 CST] 00000000 CacheProvider W CWOBJ0006W: An exception occurred:
com.ibm.websphere.objectgrid.ObjectGridRuntimeException: The catalog server did not contain an
ObjectGridDeployment matching the name DYNACACHE_REMOTE At
com.ibm.ws.objectgrid.ObjectGridManagerImpl.getRemoteObjectGridDeployment(ObjectGridManagerImp
l.java:440)
...
[11/26/10 14:32:37:449 CST] 00000000 ServerCache E DYNA1066E: Unable to initialize the cache provider
"com.ibm.ws.objectgrid.dynacache.CacheProviderImpl". The Dynamic cache is used to create the cache
instance "baseCache" instead of the configured cache provider.
[11/26/10 14:32:37:449 CST] 00000000 ServerCache E ENGLISH ONLY MESSAGE: coreCache == null ||
featureSupport == null....Check FFDC logs for Exceptions
[11/26/10 14:32:37:480 CST] 00000000 ServerCache I DYNA1001I: WebSphere Dynamic Cache instance
named baseCache initialized successfully.
[11/26/10 14:32:37:480 CST] 00000000 ServerCache I DYNA1071I: The cache provider "default" is
being used.
```

This slide shows systemout.log messages when the WebSphere default dynamic cache provider is used. These messages could indicate your DataPower XC10 or your WebSphere Commerce cell are not configured properly.

Test application



- Invoke the WebSphere Commerce application several times to cache data
- Login to the DataPower XC10 appliance and review the session grid
- Example: **Monitor** → **Individual Data Grid Overview** and click **<your_data_grid_name>**



To test the WebSphere Commerce application, invoke the URL you want to use for testing dynamic cache functionality. After several tests, login to the DataPower XC10 appliance and navigate to the monitoring panel for your dynamic data cache. For example, navigate to Monitor, then click Individual Data Grid Overview and click your data grid name. Then use the graphical display to see the caching that occurred when you invoked the URL.

Section

Summary

This section will summarize this presentation.

Summary

- Requires WebSphere eXtreme Scale client
- Configuration
 - Catalog service domain
 - Dynamic cache data grids
 - Dynamic cache instances
 - Servlet cache
 - Object cache
 - basecache
 - Custom configuration and performance properties

WebSphere Commerce can use the IBM WebSphere DataPower XC10 appliance to store data from your WebSphere Application Server dynamic cache instead of caching the data in local memory. This setup allows for lower local memory requirements, enabling the WebSphere Commerce JVMs to run more efficiently. Since all data is cached in the collective, individual WebSphere Commerce JVMs are less likely to have “stale” data, and do not have to call back-end systems that generate the data as often, reducing load. This setup also allows for high availability of cache data and improved performance.

Using the DataPower XC10 dynamic cache requires a few simple configuration changes; your deployed code does not need to change. These steps are discussed in more detail in the DataPower XC10 presentation “Dynamic data caches” in the IBM education assistant.

References

- More details on the performance and throughput are outlined in a study published on developerWorks that provides performance comparison metrics.

http://www.ibm.com/developerworks/websphere/techjournal/1008_genkin/1008_genkin.html

- WebSphere eXtreme Scale information center
<http://publib.boulder.ibm.com/infocenter/wxsinfo/v7r1/index.jsp?topic=/com.ibm.websphere.extremescale.over.doc/cxsdynacache.html>
- Redbook: Scalable, Integrated Solutions for Elastic Caching Using IBM WebSphere eXtreme Scale
<http://www.redbooks.ibm.com/redbooks/pdfs/sg247926.pdf>

Here are some helpful resources. The first article discusses how you can use WebSphere eXtreme Scale, and by extension DataPower XC10, to reduce restart time for your e-commerce site, improve response time, and improve throughput during frequent cache invalidation.

The second link provides specific details about how to configure your WebSphere Application Server cell to use a DataPower XC10 collective for dynamic caching.

The third link references an IBM Red Book which includes a chapter that discusses Integrating WebSphere Commerce with WebSphere eXtreme Scale. The concepts for XC10 integration are similar to those described in this red book, but the steps are simpler.



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