IBM

IBM WebSphere DataPower XC10 V2.0

Performance improvements

WebSphere software

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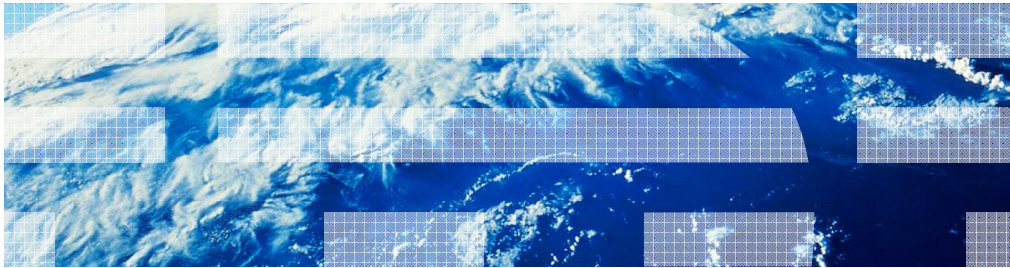
This presentation discusses some of the performance improvements in WebSphere DataPower XC10 V2.0 from version 1

Agenda

- Performance improvements
- Data grid capacity limitation
- Summary

Performance improvements

The presentation will cover performance improvements and the data grid capacity limitation which is a new feature in V2

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Section

Performance improvements

This section will talk about performance improvements in XC10 v2

Performance improvements

- New 9005 hardware
  - more cpu, more memory, larger and faster ssd, more and faster network capacity)

- Rewrite of the diskoffload code
  - making better use of the memory on the appliance before having to access the disk

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The two big performance items for XC10 v2 are the new 9005 hardware and the re-write of the diskoffload code.

The new 9005 hardware has more cpu, more memory, larger cache and better performance. The diskoffload code has been re-written so that there is better use of the memory on the appliance before having to access the disk.

IBM WebSphere DataPower XC10 V2 (New in V2!)

9005 box

✓ New Form Factor (2U)

✓ Larger Cache (240 GB)

✓ Better Performance (Faster SSD, Use of RAM)

✓ Improved monitoring (SNMP Support)

✓ Support for non-Java Applications (REST Gateway)

✓ Grid Capping

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This slide takes a closer look at the 9005 hardware.

IBM WebSphere DataPower XC10 V2 9005 box is slightly different from the version1 box. 9005 box is a 2-U form factor with a larger cache (240 GB) and better performance. The cache scales elastically without application downtime. The ability to quickly and easily increase cache capacity as needs grow, unbinds cache from application server memory constraints. Other benefits include; better performance, additional SNMP support in the area of monitoring, support for non-java applications and grid capping. The hardware specific comparisons between the 9004 hardware and 9005 hardware are displayed on the next slide.

IBM WebSphere DataPower XC10 capacity

Platform	DataPower 9004	DataPower 9005 (**New in v2!**)
Form	**1U mountable appliance**	**2U mountable appliance**
Ram	32Gb	96GB
Solid-state drive	160GB	320GB
Effective cache size	**107GB**	**240GB**
Cache architecture	32-bit	64-bit
Processor	Dual 4-core Intel Xeon processor	Dual 6-core Intel Xeon processors
Ethernet	**4 x 1Gb**	**2 x 10Gb** **8 x 1Gb**

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This slide shows you the specs for both 9004 and 9005 hardware.

The IBM WebSphere DataPower XC10 V1 was based on the DataPower 9004 platform. The 9004 is a 1-U mountable appliance with 32 GB of ram 160 Gigabytes of storage per unit with an effective cache size of 107 GB. On the contrary, IBM WebSphere DataPower XC10 V2 is based on 9005 platform. The 9005 hardware contains 96 GB of ram, 320 Gigabytes of storage per unit (twice as much) with a cache size of 240 GB. It's also a dual 6-core intel processor compared to the 9004 which is a dual-4 core intel processor. The net result of using 9005 over 9004 is an improvement with performance…at least three times the improvement.

XC10 version2 on 9004 hardware

9004 box

WebSphere DataPower XC10

- XC10 version2 supported on 9004 (our EP cloud)
  - Grids retained if upgrading from XC10 v1 to XC10 v2
- Migration of XC10 code from 9004 to 9005 box supported

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To address the value of IBM WebSphere DataPower XC10 V2 further, some common questions that could be considered are:

Will the XC10 version2 code work on 9004 hardware?

Yes - You can indeed install XC10 v2 code on the 9004 hardware. However, Since the 9004 has much less memory (32gigs instead of 96gigs) as you saw in the previous slide it can only keep about 6gigs of data in memory (compared with 56gigs on a 9005). This means that the performance is lower (due to disk activity) on a 9004 for grids over six gigs in size.

Does moving from version1 code to version2 code affect your grids if already setup?

No - If you have XC10 V1 installed on 9004, with grids set up, you should be able to upgrade the appliances without losing anything. Both the definitions and the content should be retained through the upgrade process, assuming you have multiple appliances and you do the upgrade one at a time. If you only have one appliance, you will lose your data, but the grid definitions are retained. If alternatively you have XC10 v1 or v2 installed on 9004 and you want to move the data to 9005 hardware, you can do so by migration. You will need to assimilate the 9005 into the 9004. Then de-assimilate the 9004 leaving you with the 9005.

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Section

Data grid capacity limitation (New)

Performance improvements

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Grid capping is a new feature in XC10 version2 which helps with performance of the cache. The next two slides will discuss this feature.

Data grid capacity consumption – New

Name:	Chao_rest_grid
Catalog servers:	[9.3.75.209:2809]
Security settings:	☐ Enable security ☐ Enable authorization
Access granted to:	Administrator [owner] Admins [all] [remove] Add more...
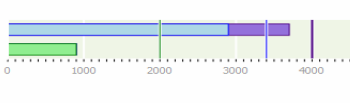
⊟ Show advanced attributes

Replication settings:	Synchronous replicas 0 ▾ Asynchronous replicas 1 ▾
	☑ Limit the amount of capacity for this data grid
Data grid capacity:	**Current Capacity Consumption** MyGrid All Limited Grids All Unlimited Grids MyGrid Capacity Limit Maximum Limited Grid Capacity Total Collective Capacity
	* Limit primary data consumption to: [ ] MB

You can configure a maximum capacity for any data grid type: simple data grids, session data grids, or dynamic cache data grids. The feature is located under "show advanced attributes" for each cache. By default, data grids do not have a configured capacity limit. After you configure maximum capacity limits on each data grid in the appliance or collective, the capacity limit is enforced. This is done by comparing the total size of all primary data in the data grid to the configured capacity limit for the data grid. The capacity used by replica copies of data is not counted when the data grid is measured against the configured capacity limit.

The maximum capacity limit is a maximum amount of data that can be inserted into the data grid. The limit is not a guarantee of an allocated amount of space for the data grid. Therefore, a data grid might not be able to reach its configured capacity limit if the collective does not have the capacity to store the data. Reasons for insufficient capacity in the appliance or collective might be a high capacity limit on the data grid, or capacity that is consumed by other data grids in the collective.

When the capacity limit for a particular data grid is reached, insert operations that breach the limit are rejected. Client processes receive an exception in response to insert requests. Read, update, and delete operations succeed even if the data grid is exceeding its capacity limit. With these limited operations, the data grid can run at a minimum level of function but additional growth of the data grid is prevented. By configuring capacity limits on the data grid, you can ensure that the storage capacity for the collective is used in a predictable manner.
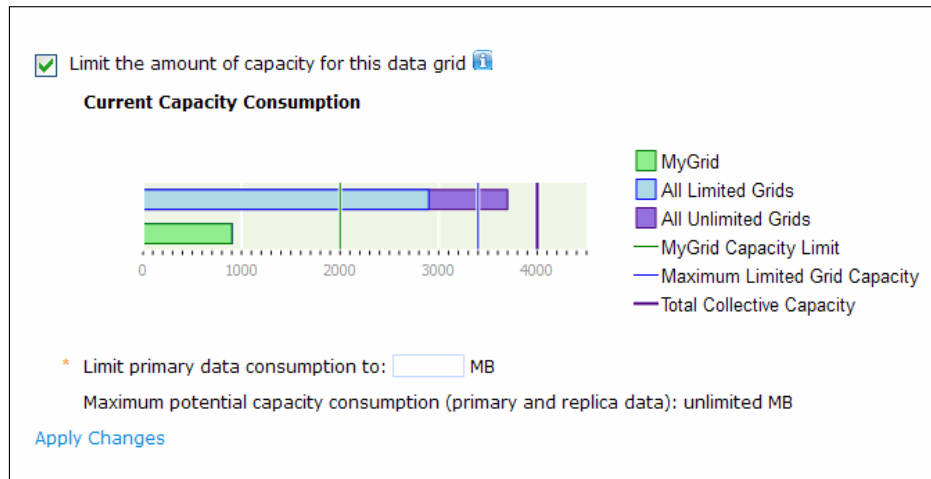
This slide shows you an example of how the data grid capacity works.

Looking at the color-code: Green is the grid you are looking at, blue is all grids that have a limit, purple depicts grids without a limit.

In this chart, the current data grid that is being configured, MyGrid, is currently using 900 megabytes of capacity. It has a currently configured capacity limit of 2000 megabytes. At the collective level, the total capacity of the collective is 4000 megabytes. In addition, the total of all the configured limits on the capacity-limited data grids is 3400 megabytes. Those grids are currently using 2900 megabytes (in light blue). Finally, there is at least one data grid in the collective that does not have a capacity limit defined. These data grids without defined capacity limits are consuming approximately 900 megabytes.

Section

Summary

Performance improvements

This section will summarize this presentation.

Summary

- Performance improvements in hardware:
  – New 9005 hardware has more cpu, more memory, larger cache and better performance
- Internal performance improvements:
  – Rewrite of the diskoffload code
  – Data grid capacity limitation
    - Limits on the amount of data storage that a particular data grid can use

In WebSphere DataPower XC10 version 2, there have been some significant performance improvements specifically in the hardware. 9005 hardware adds a larger cache and better performance.The diskoffload code has been re-written so that there is better use of the memory on the appliance before having to access the disk.

There have also been some internal improvements made including data grid capacity limitation. Configuring a maximum capacity limits the amount of data storage that a particular data grid can use. The capacity limit ensures that the available storage capacity for the collective is used in a predictable manner.

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