Case Study: Internet Social Network Portal

One of the world's largest Internet social network portals begin to experience intermittent performance spikes within it's rapidly growing social network, serious enough to threaten end user experience. With the potential to impact over 100 million users worldwide in more than 20 markets and regions around the globe, the recurring performance problems quickly gained the attention of the company's COO.

The Challenge

Companies' production DBAs attempted to troubleshoot performance spikes with Oracle Enterprise Manager and AWR. AWR was collecting performance data every 15 minutes at best, but the spikes duration had intervals between 5 and 15 seconds at most. The AWR data and reports were not of sufficient granularity and quality to diagnose root cause, or even to provide meaningful insight.

The problem was escalated to Oracle Support and internal Oracle tools were deployed to collect performance statistics (OS Watcher). However, even with new data in place, the available information was still not sufficient to identify root cause and resolve the problem.

The Solution

Per Oracle reference Enteros was brought in to work on this issue. We recommended using Enteros UpBeat High Load Capture, a key product in the Enteros UpBeat software suite, to diagnose and troubleshoot the spike-related performance problems.

High Load Capture collects performance data with sub-second frequency across database, server and application tears. Such high granularity of data collection, enabled by our patented technology, is crucial for the resolution of low-duration, high-impact performance problems.

Within a single day, our specialists installed and deployed High Load Capture performance data collectors across all impacted tiers of the production environment, instrumenting the database (Oracle RAC 10g), OS (Linux Red Hat Enterprise) and SAN (NetApp). A custom plug-in was developed for the SAN data collector. The customization was performed onsite and took less than two hours, inclusive of the time necessary to communicate with SAN engineers and to define the collector script.

Site operations personnel and DBAs were instructed to notify us as soon as the response time spike recurred. Upon notification, we verified that the necessary data was indeed collected, and proceeded to perform correlation analysis using High Load Capture.

The result of investigation showed that the performance spikes had four independently contributing factors that had to all be present at the same time.

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Our specialist was able to identify the following sequence of events:

1. Oracle database had Data Guard in place that was sending archive logs to the Standby DR (Disaster Recovery) database.

2. Archive log switches and their shipments to standby database executed within a time period of less than four seconds, triggered a SAN cache flush on a NetApp Filers.

3. During the cash flush, the I/O subsystem was not able to process I/O requests – confirmed in both OS and database layers.

4. At the same time an SQL query, consuming very high amount of Buffer Gets was executed. This query was submitted by an internal job to facilitate gathering business metrics related to the growth metrics of the social net.

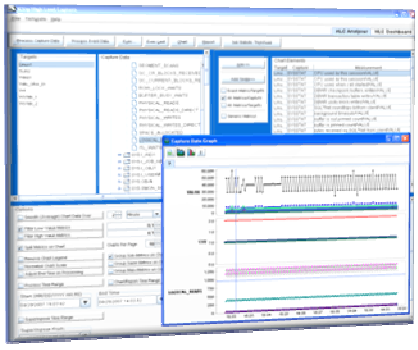
Enteros UpBeat High Load Capture clearly identified that

This query was flushing large amount of data buffers from the database buffer cache. Other user queries running at the same time were forced to access the disk to reread necessary data. At the same time, I/O subsystem was irresponsive due to on-going SAN cache flush and, as a result, causing an exponential increase in user requests response time.

The Outcome

Once we were able to identify the root cause of the performance spikes, resolving the performance problem was straightforward. Enteros' specialist recommended not to use Data Guard archive log shipment, but rather ship archive logs using in-house script with the sufficient delay between log switch and log shipment, thus eliminating triggering cause of the SAN cache flushes.

After Enteros' recommendation was implemented, the performance spikes disappeared, and user response time SLAs returned to expected levels.



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