STORTRENDS IDATA

By Logan G. Harbaugh
SSG-NOW Product Validation Analyst
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There are many options in storage these days, with so many different interconnects, speeds, types of drives and potential bottlenecks, that it can be very difficult to find bottlenecks and resolve them, or to identify which applications or times of day that the storage network is affected. While there are network and storage monitoring tools that can deliver reports on these areas, most are relatively expensive.

Enter StorTrends iDATA (Intelligent Data Analysis Tracking Application) by American Megatrends, Inc. (AMI). StorTrends iDATA is a free tool an IT administrator can download and run on any Windows system to monitor as many Windows 2003, 2008 and 2012 and VMware servers as desired. The program runs for seven days by default, though a shorter period can be specified.

Installation is simple, menu-driven throughout. The system scans the local network and provides a list of IP addresses it finds. Once servers are selected, the administrator can provide login credentials, and a local drive to store the output file. Windows servers need to have the WMI (Windows Management Instrumentation) service enabled and excluded from the firewall. The Remote Registry service must also be enabled and the RPC service enabled, in order for data to be collected remotely. The View Privileged User permission is required for monitoring VMware ESX servers, and if information on logical disks is needed, VM Tools must be installed on each virtual machine.

The tool will then run for the designated period. A console is displayed on the Windows system running the collection tool, which shows current throughput and IOPS for the storage attached to each server.

Once the monitoring period is finished, the system saves an encrypted StorTrends iDATA file, which the administrator can then send to AMI StorTrends for analysis. This can be configured to happen automatically, or the admin can attach the file to an email and send it manually. Our testing included decrypting the iDATA file to confirm AMI StorTrend's assurances that nothing personal or identifiable is collected – not even hostnames are transmitted to AMI, no filenames or pathnames, just the OS each server is running, CPU, memory and NIC information, and disk I/O statistics.

AMI's analysis includes a variety of statistics, from average, peak and 85th and 95th percentile stats for throughput and IOPS, CPU, memory and network utilization, read/write ratios, IO sizes, peak queue depths and peak latencies, both as numerical summaries and graphs over time. The report also includes data such as the amount that disk space consumed grew during the test period. (See graphic on the following page for examples of data collected and analyzed.)

Overall Summary

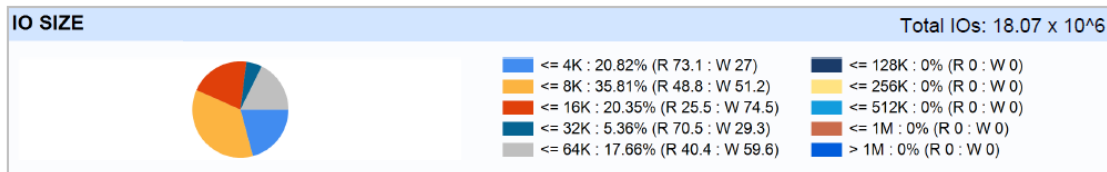| Servers Monitored	Total Cores	Total Processors	CPU Aggregate	Total Memory
1	2	2	7.2 GHz	4 GB

Collector version: 1.9.0.10342

Information gathered from [4/2/2014 4:34:46 PM] to [4/3/2014 4:35:56 PM]   [01 day, 00 hrs, 01 mins, 10 secs]

Capacity (GB)	Disk			Read Write Ratio (%)
	Throughput (MBps)	Percentile	IOPS (Count)	
Used: 1174.9	70.18	**Peak**	1192.96	READ : 60 %
Free: 492.92	60.6	**95%**	992.8	WRITE : 40 %
	24.15	**85%**	439.78	

Analysis also includes other relevant information. For instance, in our case, the analysis found the following:

- Latency of physical disks Disk2 [C:] was above 20ms during most of the monitored time (50%).
- Queue length of physical disks Disk2 [C:] was above 2 during most of the monitored time (50%).
- Most of the logical disk reads (50%) were due to page faults during most of the monitored time (50%).

IO SIZE — Total IOs: 18.07 x 10^6

<= 4K : 20.82% (R 73.1 : W 27)	<= 128K : 0% (R 0 : W 0)
<= 8K : 35.81% (R 48.8 : W 51.2)	<= 256K : 0% (R 0 : W 0)
<= 16K : 20.35% (R 25.5 : W 74.5)	<= 512K : 0% (R 0 : W 0)
<= 32K : 5.36% (R 70.5 : W 29.3)	<= 1M : 0% (R 0 : W 0)
<= 64K : 17.66% (R 40.4 : W 59.6)	> 1M : 0% (R 0 : W 0)

Disk - Throughput (MBps)	
Peak Percentile	70.18
95th Percentile	60.6
85th Percentile	24.15

IOPS (Count)	
Peak Percentile	1192.96
95th Percentile	992.8
85th Percentile	439.78

Peak Queue Depth	
DAS	SAN
28.71	36.17
Disk1 [E:]	Disk3 [F:]

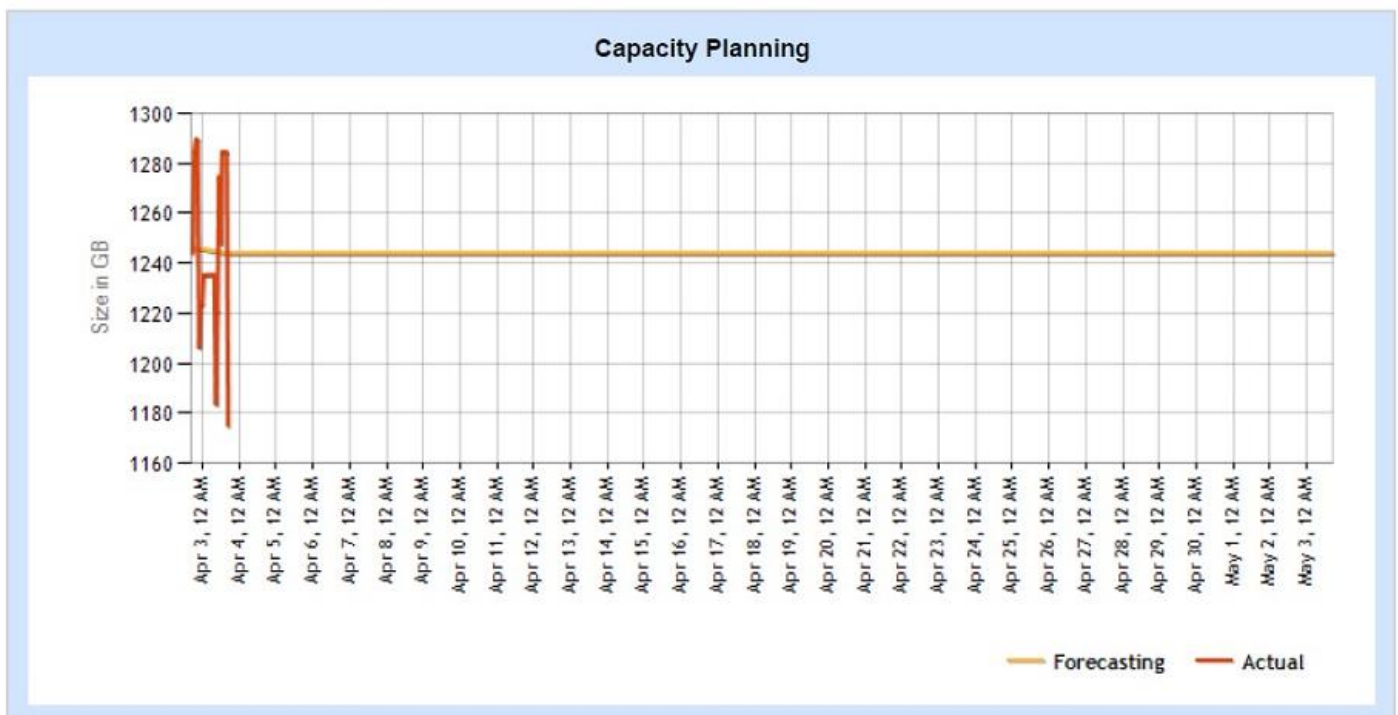| Disk - Peak Latency	
DAS	SAN
Read : 79.4 ms	Read : 386.06 ms
Write : 205.94 ms	Write : 418.04 ms

Finally, the report includes a Capacity Planner and Recommendation section, which tracks expected growth based on the increases observed during the test period, as well as an analysis of whether upgrades to faster NICs or disks are likely to improve server performance.

Capacity Planner & Recommendation

Expected Growth Rate: 830 MB / Day

For administrators trying to find a bottleneck in their system, or to justify upgrades to speed or capacity of storage systems, the historical tracking capabilities of this tool are invaluable. It not only allows for obvious correlations such as several systems hitting peak bandwidth at 2am, indicating that staggering backup times might help, but less obvious ones, such as memory utilization hitting 100% during peak transfers, indicating that more RAM in a server might improve performance substantially.

While these statistics can be gathered manually using the performance monitoring tools built into Windows or within hypervisors, setting this up can be a pain, especially across many systems simultaneously. StorTrends iDATA automates the process, and the analysis is also very useful, especially for a systems administrator who may not have a lot of storage background.

On the following page is the analysis of our sample network:

Recommendation

Hello Logan,

Thank you for taking the time to run our StorTrends iDATA tool. In reviewing your data, we have been able to properly analyze your environment. Let's take a closer look at the results.

First off, looking at your disk throughput, I can confidently say that you will do fine with 1 GbE NICs as opposed to 10 GbE NICs. Your peak throughput was 70.18 MBps, well below the limit of 110-120 MBps of a 1 GbE NIC. Furthermore, your throughput at the 85th percentile shows that during 85% of your run, your throughput was not greater than 24.15 MBps.

Next, taking a look at your capacity needs, we can see that you are currently using 1,174.91 GB. Your growth rate seems pretty minimal, with only one of your volumes, drive F:, growing during this run at a rate of 0.83 GB/day. Given this information, we can forcast that your capacity will grow to 2,083.76 GB over the next three years. A solid investment for your environment would be 1 TB drives. This will give you the needed space to let your environment grow as needed.

Lastly, let's take a look at your IOPS and what we like to call your "hot data", or the data that gets accessed on a day-to-day basis. This hot data is the most crucial part of your environment as it is what your are accessing daily. Taking a look at the report, we can see that your peak IOPS during this run were 1,192.96. Your read-write ratio was calculated at 60% reads to 40% writes. This load is not overly intensive, but it doesn't give the full picture either. Digging a little deeper to look at your hot data, we caluated this portion of your environment to be 446.32 GB/day. This number encompasses all new writes, all re-writes, and all reads that took place on a daily average in your environment.

Let us thank you once again for taking the time to run our StorTrends iDATA tool. If you would like to schedule a meeting with one of our sales engineers to dig a little further into these numbers and to learn more about our products, please contact me.

Thanks,

We found the StorTrends iDATA tool to be an excellent and useful analysis of our test bed. The analysis and recommendation report was spot-on of our environment and pointed out key statistics that we would use to make modifications or purchasing decisions for equipment. StorTrends iDATA is a safe tool that IT professionals can trust to run within their environment. SSG-NOW Labs recommends IT directors, IT managers, IT administrators run the StorTrends iDATA to make sure you are familiar with your data and how it functions. This simple and easy-to-use tool can help your company save money and headaches down the road. To learn more or to download the StorTrends iDATA tool please visit the StorTrends website at http://www.stortrends.com/resources/stortrends-idata-tool/.