

IBM Tivoli Enterprise Storage Monitoring



Contents

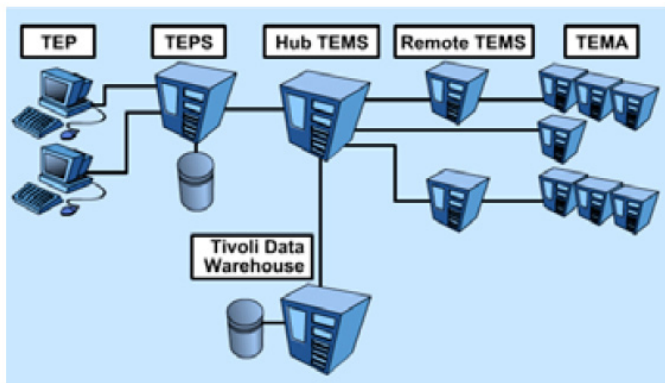
- 2 IBM Tivoli Enterprise storage monitoring
- 4 Common issues in Enterprise Tivoli Storage Management
- 5 Monitoring without a common workspace
- 5 An approach to monitoring without getting lost
- 6 Backup
- 6 Configuration and performance
- 7 Monitoring availability of space
- 7 Conclusion

IBM Tivoli Enterprise storage monitoring

Historically, storage administration monitoring for enterprise organizations has been mainframe-based. Early monitoring was primarily done using manual techniques and was driven by resource constraints—wanting to know how full the disks were, to try to guess when more storage would be needed, or when performance would start to be impacted, so that disk availability and performance were the primary focus of storage management. Storage administrators used storage pooling and data management tools to move data, gain availability and improve performance. Over time, technology improvements—such as increased cache, parallel access volumes (PAVs) and lower cost of storage—reduced those constraints and the amount of manual intervention required to tune the storage environment. As a result, monitoring requirements have evolved. Monitoring today is still centered around performance and availability, but also includes trending and forecasting as well as intelligent analysis.

Distributed storage entered the picture with a finite resource referred to as locally attached disk. Storage Area Network, (SAN) configurations with their Fibre Channel fabric topology have now proliferated to extend the local disk concept and share a storage frame with hundreds of distributed systems. SAN configuration, provisioning and security were the initial focus of storage administration in distributed platforms. Monitoring tools were incorporated into the configuration tools, to improve visibility into utilization. While hard constraints were not the driving factor in distributed storage monitoring, exponential growth drove improvements in monitoring in areas of improving efficiencies and identifying data lifecycle requirements. Monitoring today's distributed environments focuses on performance and life-cycle management of data. The differing paradigms, problem

focuses, and personnel involved in both mainframe and distributed platform storage administration have led to separate tools and “silos” of information that make it difficult to consolidate monitoring and management of storage across the enterprise.



Today, many storage administrators remain focused on a single platform, either distributed or mainframe, but that is inexorably changing. Business pressures and consolidations are challenging more storage administrators to be responsible for monitoring multiple platforms and their unique challenges and toolsets. The IBM Tivoli® Monitoring infrastructure has allowed for the integration of monitoring tools for the different platforms. While the objectives of storage administration between mainframe and distributed are aligning, the base toolsets are quite different. The Tivoli Monitoring infrastructure enables the smooth integration of various monitoring tools for the different platforms. The open flexibility of the Tivoli Monitoring framework allows storage administration of these platforms through a single portal.

For additional information, refer to one of the Tivoli Monitoring manuals at

<http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp?toc=/com.ibm.omegamon.stor.doc/toc.xml>

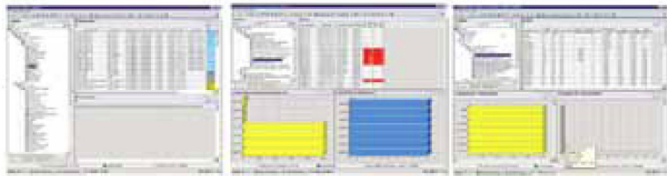
The IBM zSeries® storage monitoring begins with OMEGAMON XE for Storage on z/OS. It provides for visibility into performance, availability and early indicators of problems for direct access storage disk (DASD), tape, system catalogs, hierarchical storage management (HSM), removable media (RMM) and more. For more detailed or specialized information, additional agents may be added to the Tivoli Monitoring framework, including IBM Tivoli Advanced Catalog Management, IBM Tivoli Advanced Audit for DFSMSHsm, IBM Tivoli Advanced Reporting for DFSMSHsm and IBM Tivoli Advanced Backup and Recovery for z/OS disaster recovery and compliance management.

Distributed systems are defined as all hardware that is not IBM System z. Distributed storage monitoring includes IBM TotalStorage Productivity Center, IBM Tivoli Storage Manager and includes newer technologies.

While these systems are highly flexible, it is also important to understand that with flexibility comes an element of complexity. It is important to establish environment standards early in the design and deployment of the Tivoli Monitoring infrastructure to allow for effective control and management.

Common issues in IBM Enterprise Storage Management

A Tivoli Monitoring agent for each system is installed and registered with a Tivoli Enterprise Monitoring Server. The Tivoli Enterprise Portal navigator view is presented by platform and, when expanded, by system. An environment may have three or four different platforms: System z, Linux, UNIX and Microsoft Windows. Under each platform, there may be numerous systems, including IBM z/OS Parallel Sysplexes® and LPARS, Linux systems, various UNIX systems and perhaps hundreds of Windows systems.



Storage management monitoring across platforms

Using the standard Tivoli Enterprise Portal interfaces, cross-platform storage monitoring might require a typical storage administrator to drill down to multiple workspaces and views. Even with the capability of multiple windows, remembering the valid data between workspaces can be a challenge and a manual effort.

Storage administrators might need to monitor backups for disaster recovery purposes across multiple platforms. If an application runs on System z and on a distributed platform, both sets of backups will need to be monitored for successful completion. Perhaps the backup on z/OS uses automatic backup, archive and recovery software (ABARS) and is monitored using IBM Tivoli Advanced Backup and Recovery Manager. Perhaps the backup on the distributed platform uses Tivoli Storage Manager. The backups must occur within a certain timeframe in order to be considered viable for recovery in the event of a disaster.

Storage administrators are often held responsible for the performance related to the I/O of applications. There might be performance problems with hardware that is configured in IBM DS8000® using Total Storage Productivity Center for use on System z. These problems are not easily identified. Monitoring with OMEGAMON XE for Storage on z/OS with knowledge of the hardware configuration may provide insights into performance problems relating to configuration.

Storage administrators are typically responsible for the Availability of space. As application development moves from System z to distributed, there may be instances where data must be sent by ftp between platforms. Storage monitoring to ensure that space is available before it is needed is a key to avoiding space problems before they occur.

These examples are not meant to be inclusive of all storage monitoring needs.

Monitoring without a common workspace

A user can drill down to the distributed platform, find the agent with the data they are interested in monitoring, find the system where the data should be and either screen print it or leave it on the screen. Then, the user can create another window and repeat for the z/OS platform, find the agent containing the requested data and then drill down to the LPAR where the data is displayed and compare the data between the two screens.

There's got to be a better way

An approach to monitoring and managing enterprise storage without getting lost

Using the storage monitoring previously mentioned, along with the OMEGAMON Dashboard Edition (DE) features incorporated into Tivoli Monitoring views and their underlying queries from the Tivoli Monitoring agents into a single common workspace. Adding IBM Tivoli OMEGAMON DE on z/OS to your IBM Tivoli Monitoring infrastructure entitles the use of many features that enhance monitoring from multiple OMEGAMON agents. Tivoli OMEGAMON DE provides a portal through which you can take advantage of an expansive view into your environment. Using Tivoli OMEGAMON DE on z/OS, you can collect metrics from operating systems, middleware, databases, storage, web applications servers and network sources—for integrated performance and availability views in a single screen. OMEGAMON DE provides more sophisticated monitoring with policies. Policies are automated responses to conditions including schedules and interrogation of situation

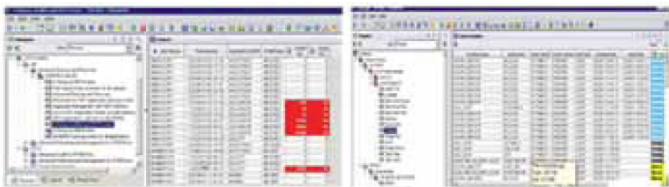
results. Policies can be used to intelligently monitor across platforms, systems and agents. It is designed to help you make decisions more quickly, efficiently and proactively on an enterprise level. Instead of locating data within the physical topology where each system must be located, expanded and the data captured, a Logical View can be defined to combine data from all of the agents where monitoring across platforms and system components are wanted. Navigation is simpler and in one place. There is a small drop in performance when running queries from multiple platforms to be displayed on a single workspace, but the choice of navigating to five different screens would probably exceed the delay of the queries.

Situations can be written to track the values of specific attributes. Where monitoring values across the various platforms is needed situation correlation can be used. Situation Correlation is when the situation evaluates not just the value of attributes but the condition of other situation conditions that match or not match the conditions coded in them.

Using the three scenarios described in the introduction, we explain what views might be combined to solve the sample usage cases.

Backup

For the application backup scenario that must occur on separate systems, a customized logical view can be created using a query from IBM Tivoli Advanced Backup and Recovery for z/OS that contains backup information from an application that runs on an LPAR. In the same workspace, another view can be created using a query from IBM Tivoli Storage Manager that contains backup information from a system that runs on Linux. Situations or policies can be defined to provide 24-hour monitoring and alerts for both platforms. The resulting workspace is a like single pane of glass instead of multiple screens requiring drill-down to multiple workspaces. The backup from z/OS can be monitored using the workspace “A History of ABM and CBTI Events” from IBM Tivoli Advanced Backup and Recovery manager. The addition of filtering can isolate the backups of interest for a particular application, while the backup using Tivoli Storage Manager on the distributed side can be monitored using the workspace “Schedule” from Tivoli Storage Manager. The exact same query can be used or customized in the new logical workspace.



Policies or situations can be defined for each platform to determine if the backup was successful and within the appropriate window and correlated upon the successful monitoring of the other platform.

The entire Advanced Backup and Recovery Agent navigator tree can be added to the logical workspace allowing drill-down capability to any additional data as needed. The IBM Tivoli Storage Manager Agent navigator tree item can also be added to the logical workspace. When defined correctly, the situation events defined at the physical view also appears in the Logical View.

Configuration and performance

Storage in an IBM DS8000 may be configured for System z only or also contain storage configured for distributed systems as well. Performance can be affected either by configuration or workload.

Selected views from TotalStorage Productivity Center and IBM Tivoli OMEGAMON XE for Storage Views on Application Monitoring or Cache CU Performance and Cache CU Status can be used to see the impact of the configuration on the I/O performance on System z.

The workspace Volume Data as well as HBA Data from TotalStorage Productivity Center along with OMEGAMON XE for Storage Application Summary and System-Managed Storage (SMS) Storage Group performance data may aid in the identification of a configuration -related performance problem. With user -specific thresholds and situations defined to raise an event when critical application performance is affected, the user can access a single view of all components involved in the configuration of the storage. The view is not a guarantee that the problem is configuration-related, but the information is a key to identifying solutions.

Monitoring availability of space

In this scenario, SMS Storage Group Space workspace is viewed for available space along with the distributed platform system monitoring agent. Thresholds provide the visual alert, while situations provide the notification in advance of a potential problem. Using OMEGAMON XE for Storage on z/OS views of SMS Storage Group Space to monitor a Storage Group, volume or a list of volumes in the User DASD Group Space navigator workspaces, monitoring of availability of space can alert the user to shortages before they can have an impact on an application. On the distributed platform, the appropriate agent view is selected for disk storage monitoring. Disk space on a Windows system can be monitored using the Logical Disk Usage view to determine if sufficient space is available for the FTP to complete successfully. Situations can be defined to monitor both platforms at an interval well in advance of critical application runs, allowing enough time to correct a potential space availability issue before it affects critical application processing.

Conclusion

For today's storage administrator who is responsible for monitoring both zSeries and distributed storage, adding IBM Tivoli OMEGAMON DE on z/OS adds to the use of the IBM Tivoli Monitoring infrastructure to customize monitoring across platforms.

By having the views on a single logical view, all affected systems can be monitored relative to other platforms, monitoring agents and systems. Multiple views might be desirable depending upon the configuration and platforms involved.

Benefits include:

- Enhanced visibility across the enterprise of all systems affecting a business application
- Improved communications across platform support teams
- Simplified problem determination, avoiding costly outages
- Taking full advantage of technology resulting in better resource utilization and reduced manpower costs
- Improved service and availability

Stay tuned for a more in-depth explanation of how these workspaces are created using the features of IBM Tivoli OMEGAMON DE on z/OS in the IBM Tivoli Monitoring Portal.

Author

Vickie Dault, IBM Technical Storage Specialist



© Copyright IBM Corporation 2011

IBM Global Services
Route 100
Somers, NY 10589
U.S.A.

Produced in the United States of America
August 2011
All Rights Reserved

IBM, the IBM logo, ibm.com, DS8000, OMEGAMON, Tivoli, zEnterprise, z/OS and zSeries are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at ibm.com/legal/copytrade.shtml Other company, product and service names may be trademarks or service marks of others.

Other company, product and service names may be trademarks or service marks of others.



Please Recycle