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Why Windows Defragmentation Isn't Enough
The Essentials Series

Fragmented Enterprise Environments Need Enterprise Features

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So now you know fragmentation prevention's story. But there are still pieces of it that could hurt you if you don't consider wisely the full set of features you need.

Fragmentation prevention fully eliminates many of the old approach's problems. Yet this novel solution itself needs enterprise tools to be fully manageable. Those tools support policy-based configuration. They create enterprise monitoring dashboards. They enable centralized control, yet still enable standard users to make their own decisions when necessary.

Enterprise control requires enterprise toolsets. Learn about what capabilities an enterprise fragmentation prevention solution must have in this final article.

Advanced Feature Sets Enterprises Require

Figure 1 in this series' first article highlighted what is almost the entire user interface for Microsoft's built-in defragmentation tool. That user interface comprises a single console with three buttons: one to analyze the system, one to defragment it, and a third to set up a schedule.

These three buttons are great for the consumer user, who needs a minimal interface for accomplishing just a few tasks. But enterprises require a greater level of instrumentation in order to configure and validate task completion, report on results, and continually present useful metrics for justifying a solution's business value.

It is exactly those advanced features that enterprises should look for when deciding on a defragmentation solution for the entire business. The next sections will analyze each of these advanced needs in turn.

Policy-Based Configuration and Centralized Control

Most enterprises assert computer configurations by fiat. The process of controlling corporate resources through policies ensures the consistent configuration of computers across the enterprise. This is the case for most types of support software such as anti-malware, firewalls, and so on. Fragmentation prevention software is no different, requiring centralized control that can be handed down to individual computers through policy distribution.

An effective fragmentation prevention software solution should include a centralized console for administrators. That console enables them the ability to establish configurations for corporate computing equipment. Such a solution is not easily attainable through the native Microsoft tool alone.

A centralized console should also provide granularity in terms of how files are handled. For example, an IT organization may desire that certain file types are excluded from attention by the fragmentation prevention solution. This may be due to concerns of application conflict or resource impact. A centralized console will enable administrators to configure exclusions on a global level, rather than at each individual computer.

Special Considerations for Special Users

Centralized control also presents the ability to create exceptions for special users. These users may be those who are rarely in the office or require end-user access to configure fragmentation prevention services. The Windows native tool for defragmentation requires Administrator access in order to make modifications to configurations.

Your selected solution should provide the capability to granularly control which users are granted additional access to make configuration changes based on group or job role, without needing to grant those users Administrator rights.

Enterprise Monitoring and Dashboards

The native Windows defragmentation tool is also limited in how it monitors and alerts administrators about the success or failure of defragmentation activities. Simply put, it doesn't.

This shortcoming is not necessarily critical in a consumer environment where the number of computers is low or when the success or failure of defragmentation activities is of little importance. However, in an enterprise environment—particularly one where fragmentation prevention solutions are used on servers in the data center—having the necessary instrumentation, monitoring, and administrator dashboards in place is critical to validating the success of fragmentation prevention activities.

Metrics for Asserting the Solution's Added Value

One area in which management dashboards are particularly important is in continuously quantifying the added value of the fragmentation prevention solution. Consider the following: Fragmentation prevention is a useful addition to an enterprise's computing environment. At the same time, investing in such a solution requires recognizing that it provides a benefit.

When such a solution's metrics can continually quantify that benefit back to the IT organization, it can continually assert the fragmentation prevention solution's ROI. Finding a solution that can provide exactly those metrics ensures that such a solution's added value is recognized.

Special Considerations for Servers

Although fragmentation prevention is often thought of as a desktop performance improvement solution, such as solution provides benefits for an enterprise's servers as well. Servers experience the same kinds of file fragmentation as do desktops. Critically important to recognize, however, is that servers have very different needs.

As has been mentioned before, servers tend to be scheduled with resource-intensive activities outside the normal work hours. These activities, such as backups, anti-malware, and other background jobs, are scheduled during these hours so that their processing does not conflict with user activities during the work day. Adding the resource consumption associated with native defragmentation activities can have a negative impact on each of the other after-hours activities.

In contrast, fragmentation prevention software tends to not have the same impact on resource consumption. This reduces the impact of its activities on servers. At the same time, your chosen solution should include special considerations for servers, providing the ability to throttle the resource consumption of fragmentation prevention services.

The Extra Concern of VSS

Microsoft's Volume Shadow Copy Service (VSS) is commonly used on file servers (among others) to provide access to previous versions of files. VSS leverages the use of volume snapshots to enable this previous-version capability.

If not properly prepared for VSS integration, a defragmentation or fragmentation prevention solution can cause issues with the creation and management of these VSS snapshots. Specifically, the activities of such a solution may inadvertently cause the VSS storage area to grow very quickly, forcing previous versions to be deleted.

Your chosen solution should include the ability to work with VSS-enabled volumes without impacting the VSS storage area. Lacking this ability, users may not be able to restore needed previous versions of their documents.

Special Considerations for Virtual Environments

Virtual environments are particularly needful of fragmentation elimination. At the same time, they are particularly sensitive to fragmentation prevention solutions' resource consumption.

Virtual environments consolidate each of the files on a virtual machine's disk into a single file. Multiple virtual machines can be stored within the same physical volume on a server. Thus, virtual machine disks must be considered for fragmentation prevention, and at the same time, each of the virtual machine disk files on the host must be considered.

A central problem with this doubling of effort relates to the resources that are typically consumed by defragmentation activities. In a virtual environment, defragmentation inside the virtual machine and at the host can consume substantial resources. For example, ten collocated virtual machines on a physical host might require eleven different isolated defragmentation processes. The net result of these activities can be a significant drain on available resources for processing the virtual machine's primary workload.

Your fragmentation prevention solution must include the ability to accomplish its job without involving significant consumption of host resources. This can be enabled through special virtual hard disk optimizations as well as the resource conservation that is intrinsic to the fragmentation prevention approach.

SSD Support

Last are the special needs that today's Solid State Drives (SSDs) require. SSDs are a special kind of disk that enjoy significantly improved read and write rates due to the elimination of the classic spinning disk drive. Although SSDs enjoy this performance enhancement due to their architecture, the performance benefits of SSDs actually diminish over time if they are left in a fragmented state.

Unlike traditional spinning disks, SSDs have a comparatively limited number of write activities that can be done on each bit of storage. Essentially, every time you write to an SSD, you slowly reduce its lifespan. This limitation forces the Windows native defragmentation solution to disable itself when an SSD is detected in order to protect the lifespan of the disk. Since both of these realities are at odds, your chosen solution should include special compensation for SSDs. A best-in-class solution will incorporate fragmentation prevention in addition to special SSD optimizations to ensure performance without reducing lifespan.

Look for Fragmentation Prevention as well as Enterprise Features

At the end of the day, the purpose of eliminating fragmentation is ultimately to increase and maintain system performance. Without attention to file fragments, a system will slowly see its performance drop to levels where a worker's productivity is impacted. As such, there is obviously a reason Microsoft included a defragmentation tool with its Windows operating system (OS).

Yet that solution remains limited in what it can provide to the business environment. Lacking enterprise features such as centralized control, monitoring and alerting, dashboards that quantify the solution's ROI, and special considerations for servers, virtual machines, and new drive types, the defragmentation activity can in fact represent a cost to your business. Finding the right solution means finding one that incorporates both fragmentation prevention technologies and the right toolsets that make it useful for the enterprise environment.

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