

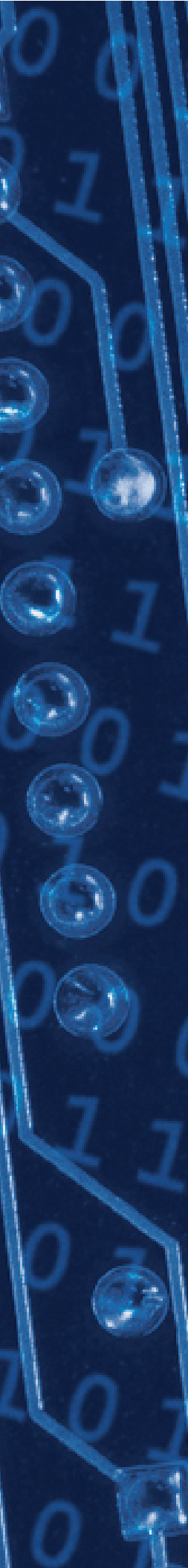
ESI SOFTWARE



A Technical White Paper

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## Table of Contents

<b>Executive Summary</b> .....	3
Availability Challenge.....	3
Reaching Your Goals.....	4
Integration.....	4
FileNet Image Services performance considerations.....	4
<b>System Management Functions</b> .....	5
Monitoring the FileNet System.....	5
Monitoring Event Logs and Storage Library Messages.....	5
Messages.....	5
Informational Messages.....	5
RSVP Messages.....	6
Normal-Mode RSVP Messages.....	6
Monitoring the Flow of Work.....	6
Monitoring Storage Use.....	6
Monitor Database Use.....	7
Security Reports and Logs.....	7
<b>Benchmarking</b> .....	7
<b>Simplifying Management of the Complex Environment</b> .....	8
Simplifying Management of the Complex Application.....	8
<b>Conclusions</b> .....	10



## Executive Summary

The daily demand for information in today's business is ever increasing. Companies need to consider making tactical investments in a solution that is part of their overall enterprise design.

ESI Software's ManageWare IT Infrastructure Library (ITIL) compliant solutions are designed to increase productivity and performance by enabling operators to manage their systems 24x7. With "Out of the Box" availability, and automated recovery actions, ESI Software ManageWare provides maximum capabilities for your IT business needs.

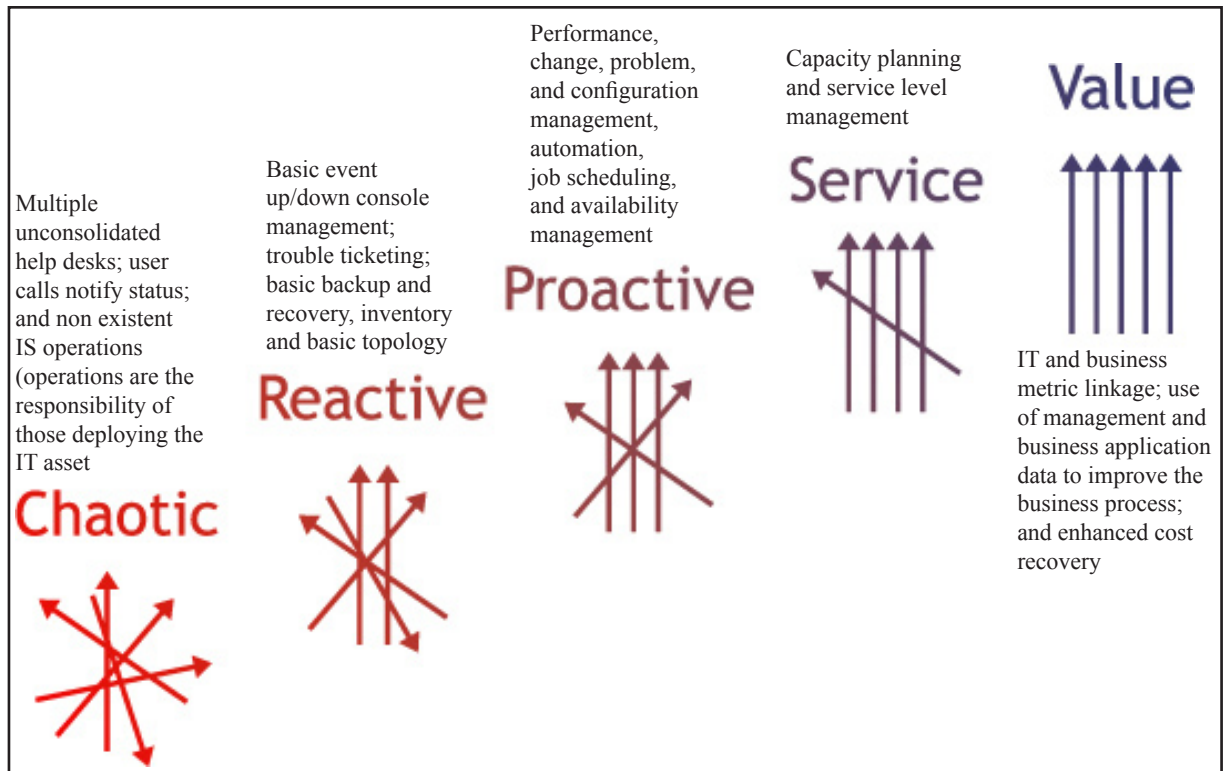
## Availability Challenge

Managing a FileNet Image Services environment presents an administrator with many challenges. The FileNet Image Services application is a powerful enterprise suite that has a broad reach throughout the enterprise and is critical to business success.

For this reason, it has high visibility throughout the upper and lower echelons of the corporation and is required to perform optimally during all business hours. As many businesses expand internationally, global operations require the FileNet Image Services application to be up and running, 24x365. The administrator must ensure that end users can always access the application and get the response they need. Failure to do so will have a direct impact on the company's bottom line.

Therefore, upper management carefully scrutinizes service-level agreements and often adds penalty clauses if they are not met.

The issues faced by administrators result from the FileNet Image Services application environment's complexity and the application's own complexity.



Most companies are within the first two stages of managing their ECM environment. ESI Software's extensive knowledge of ECM management can help you reach your intended goals of value and performance.



## Reaching Your Goals

To guarantee availability for your systems, ESI Software offers a solution that automates the monitoring of your FileNet Image Services environment, including logfiles, database, and applications. Not only does it notify users of current problems in the system, it also identifies potential problems, thereby allowing FileNet administrators to fix the problem before it occurs.

Because of the automated monitoring and recovery of ManageWare for Image Services, operators can now handle the FileNet environment without comprehensive familiarity with the application itself.

## Integration

Because all data collected is available via SNMP, ManageWare for FileNet Image Services can integrate most environments.

- Tivoli integration. Designed to allow multiple Tivoli systems to connect to a single system.
- Extends Tivoli framework with the graphical, intuitive enterprise console features of ManageWare
- Enables organizations to increase the scope and coverage of Tivoli
- Enhances investments in Enterprise Manager and Tivoli through integration
- Enables troubleshooting and problem resolution across platforms
- Ensures access to the entire enterprise status at all times, regardless of platform and interface
- HP Open View. Provides peer-to-peer-level integration between Enterprise Manager and HP OpenView IT/Operations.
- Enhances the effectiveness of HP OpenView IT/Operations by providing access to Enterprise Manager automation
- Increases the scope and coverage of HP OpenView by providing access to non-HP OpenView managed environments
- Increases scalability by managing multiple HP OpenView IT/Operations servers from a central point of control
- Presents a familiar interface by integrating the HP OpenView IT/Operations structure into Enterprise Manager
- Unicenter TNG. A cost-effective product that extends the management scope of the Unicenter TNG solution by delivering a seamless interface between ManageWare and the Unicenter TNG console.
- Presents a familiar interface by integrating ManageWare into Unicenter TNG
- Increases the scope and coverage of Unicenter TNG by providing access to non-Unicenter TNG managed environments
- Enhances investments through integration

## FileNet Image Services performance considerations

Performance is the way a computer system behaves given a particular workload. It is affected by the available resources and how they are used and shared. If you want to improve performance, you must first decide what you mean by performance. You can choose many different performance metrics, including:

- Response time -The interval between the time that the application sends the database request and the time that the application receives a response.
- Transaction throughput -The number of units of work that can be completed per unit of time. The unit of work could be simple, like fetching and updating a row, or complicated, involving hundreds of SQL statements.
- Data transfer rate -The number of bytes of data transferred between the FileNet Image Services application and the Storage Library per unit of time.

Performance will be limited by the available hardware and software resources. CPU, memory, and network adapters are examples of hardware resources. Communication subsystems, paging subsystems, Database SQL statements are examples of software resources.

Transaction throughput is dependent on the slowest component in the system. If you identify a performance bottleneck, you can often alleviate the problem by changing configuration parameters, allocating more resources to the problem component, upgrading the component, or adding a new component to off-load some of the work.

## System Management Functions

The system management tasks described is typical of those performed at most sites. Your site may require you to do more or fewer tasks than those listed. The primary system management functions are:

- Monitor the FileNet system
- Monitor event logs
- Monitor the flow of work
- Monitor storage use
- Remove unnecessary media

## Monitoring the FileNet System

Initially, you should monitor your system to establish a baseline for media consumption rates and job processing throughput. This can be done by doing analysis on the Storage Library parameters and the Cache hits parameters. Once you establish these baselines, continue monitoring at appropriate intervals, increasing the frequency as required. For example, monitor your media storage more frequently as your media reaches capacity, or check print queues more often if print jobs are not completing as quickly as usual. You may need to collect and analyze system use reports. These real-time reports give you the ability to perform trend analysis on baseline activity and system use and to manage your system's resources.

## Monitoring Event Logs and Storage Library Messages

Events can be errors or normal activities like starting or stopping the FileNet software. When the FileNet system software detects an unexpected condition, it immediately generates a message. Some messages are merely informational and appear from time to time without cause for concern. Some messages indicate problems. Both types of messages are called events and are stored in event logs on the system. . At least once each day, you should check all event logs. Also report event log files that are noticeably larger than usual.

## Messages

SLC displays messages in chronological order, oldest to newest. By default, the list scrolls to the newest item. You can change this by turning off New Message Scrolling in the miscellaneous menu. The system updates messages at specified intervals, but you can update them immediately by choosing Refresh from the miscellaneous menu. To see the rest of a message that does not fit within the window, double-click the message (or select a message and click the Info or Show button). In the extended message window that appears, you can click the Next and Previous buttons to display information about other messages

## Informational Messages

Informational messages report system events that have already occurred. These messages do not require any action on your part. Messages accumulate until you delete them, unless you set a limit.



## RSVP Messages

An RSVP message requires some action or response on your part. For example, an RSVP message might instruct you to load media. Double-click on a message to see a dialog displaying the entire message and the time it arrived. To respond to an RSVP message, select the message and click Reply. This displays a dialog box that contains any additional messages associated with the RSVP and tells you what to do. Always follow the messages exactly. For example, on an ODU, wait until SLC prompts you to remove storage media before you press the eject button. For ODUs, you always disable a drive before removing the storage media, unless you are following explicit prompts from SLC to remove media.

## Normal-Mode RSVP Messages

In normal mode, the robotic arm in the storage library moves storage media between slots, drives, and the loading compartment (the I/O station). You see normal-mode RSVP messages when the robotic arm is operating normally. The normal-mode RSVP messages prompt you to insert or remove storage media.

## Monitoring the Flow of Work

You must monitor the flow of work through your system, making sure operators complete jobs and the system processes batches without delays. For example, you may need to move people from scanning to indexing if indexing cannot keep up with scanning. Otherwise, batch cache can fill, halting system operation. As operators become more experienced, you can eliminate some optional tasks such as image or index verification. You should continue to monitor the progress of personnel and the entire document entry process.

## Monitoring Storage Use

You should regularly monitor storage use to prevent running out of space and thereby halting system operation. The following discussion points out the areas you need to monitor the tools you can use to perform these monitoring tasks, and some information on how to interpret the data you collect. The FileNet system software should not vary much in terms of space use, but you need to monitor the system components that consume storage space and attend to any potential problems. Resolving problems may include adjusting the use of your storage space, clearing areas of storage, storing files to tape, or purchasing additional storage media.

A partial list of storage-consuming components includes:

- Objects (including documents) stored in cache
- Databases
- Event logs
- Temporary files
- core (dump or Dr. Watson) files

Magnetic disk can be consumed by documents that are not migrated to storage media. Cache gradually filling up may be normal (for example, when you keep all documents in cache and never migrate to storage media), but a full cache may indicate a problem. Since event logs accumulate daily and are not automatically deleted, they can consume your available space over time.

## Monitor Database Use

This paper recommends replicating some database-related files, such as “init.ora” and control files, to a location other than their source path. In a non-Clustered Failover configuration, modify the init.ora file with new control file information, shut down, and restart the Oracle server for the changes to be effective.

Create mirrored sets of online redo log files. You can create a synchronous copy of the online redo log files. This can also be done using Veritas Volume Manager.

Keep online and archive redo logs in separate volumes. Keeping them in separate volumes provides some advantages such as added data protection and more flexible database recovery. Placing the redo logs in a separate volume also simplifies the management of these files. This is especially useful in a backup and recovery process.

To increase the Oracle server availability and prevent any emergency situations, avoid filling the volume to capacity.

## Security Reports and Logs

Security Administration provides reports that summarize and detail your security configuration. You can print these reports, save them to a file, or append selections to a file. In addition, the FileNet system logs security events. You can determine what information to log and then read the event logs through the Security Administration application.

### Security Reports

The Users, Groups, and Devices menus include the following reports that you can view, save to a file, or print: As an administrator, you can view information about all users, groups, and devices. Once you have selected a view, you can change the view by selecting a different one from the View menu. You cannot print reports if your primary group is (NONE).

### Logon Reports

Selecting View Logons from the Users menu displays users currently logged on to the system. You can save all or portions of the report to a file or print the report. In addition, you can sort the information by user, by location (endpoint), and by time. To terminate a logon, select it and choose Kill Logons from the Logons menu. You will see no confirmation prompt, so be sure you’re selecting the appropriate logon names.

## Benchmarking

Benchmarking compares performance in one environment with performance in another. Benchmarking can begin by running the test application in a normal environment. As a performance problem is narrowed down, specialized test cases can be developed to limit the scope of the function that is tested and observed.

Benchmarking does not need to be complex. Specialized test cases need not emulate an entire application in order to obtain valuable information. Start with simple measurements and increase the complexity only when warranted.

Characteristics of good benchmarks:

- Each test is repeatable.
- Each iteration of a test is started in the same system state.
- The hardware and software used for benchmarking matches your production environment.
- There are no functions or applications active in the system other than those being measured. Unless the scenario includes some amount of other activity going on in the system.

Note: Applications that are started use memory even when they are minimized or idle. This could cause paging and skew the results of the benchmark.

## Simplifying Management of the Complex Environment

To make managing all these different components easier, ManageWare for FileNet Image Services applications provides a single point of control. The console displays an icon for the critical components that form the FileNet Image Services applications environment, including the operating system and the database. ManageWare for FileNet Image Services shifts the administrative focus away from managing individual components such as the application, database, or operating system, to an enterprise-wide view of the entire environment. Multiple FileNet Image Services applications systems - two-tier and three-tier - can be tracked from the central monitoring platform. ManageWare for FileNet Image Services collects data on the critical components and provides a tree-like hierarchy of icons on which the administrator can drill down.

Administrators can define thresholds for the different component parameters. When these thresholds are crossed, ManageWare for FileNet Image Services automatically sends a visual alarm to the administrator via the console and or a page notification. Alarms escalate up the tree hierarchy to the highest level. The administrator can determine which system has a problem and can quickly identify the component causing it, including underlying database and operating system parameters. (All thresholds are set out-of-the-box, but are customizable by the administrator.) With this system of alarms, the administrator can avoid performing routine checks to verify the health or status of the many FileNet Image Services Applications components.

At the application level, ManageWare for FileNet Image Services monitors components including application processes, users and alerts. At the database level, ManageWare for FileNet Image Services monitors parameters including table space fragmentation and capacity, and availability of the database. The solution also provides information about the operating system including memory and swaps space usage and CPU and file system utilization.

With ManageWare for FileNet Image Services, the administrator is not tied to the console. He or she can set two levels of thresholds (warning and alarm) to initiate when potential problems emerge, before the end user is affected. If a potential problem situation occurs, administrators can be notified with customized alerts that trigger alarms via pagers or e-mails. ManageWare for FileNet Image Services can also initiate pre-defined, automated recovery actions to resolve the issue. When an administrator gets timely notification of problems, he or she can take actions before problems affect the end users. Success system administration is measured by how well the application performs for the end user.

In addition, ManageWare for FileNet Image Services provides management functions that allow administrators to take immediate action to resolve problems. For example, an administrator can shut down or start up the FileNet Image Services application.

## Simplifying Management of the Complex Application

To make managing the application, ManageWare for FileNet Image Services collects and monitors the following information:

Cache Free Sectors	Database Extend Object
Cache In-Use Objects	Database Extend Object Information
Cache In-Use Sectors	Database Extent Limits
Cache Locked Objects	Database Extent Limits Information
Cache Locked Sectors	Database Free Space Percent
Cache Percent Full	Database Free Space Percent Information
Cache Percent Locked	Database Locks
Courier Abort Connections	Database Locks Information
Courier Approved Connections	Database Number of Users
Courier Bad Connections	Database System Status
Courier Client Connections	Database System Status Information
Courier Client Fails	Document Buffer Average Waits
Courier Long Connections	Document Cache Hits
Courier Reject Connections	Document Documents Committed



Document Drive Hits  
Document Fast Batche  
Document Fast Documents  
Document Fast Pages  
Document Pages Committed  
Document Pages Migrated  
eProcess Pages Migrated  
MKF Database Fatal Error  
MKF Database State  
MKF Non-Virgin Blocks Percent  
MKF Percent Full  
Print Total Pages Queued  
Print Total Requests Queued  
eProcess Queue Work Item Count  
Security Current Users Information  
Security Deleted Users  
Security Expired Users  
Security Image Services  
Security Inactive Users  
Security Number Current Users  
Security Number Logon Rejects  
Security Visual WorkFlo SLU  
Security Arm Moves  
Storage Library Deleted Documents

Storage Library Disabled Drivers  
Storage Library Loads  
Storage Library Status  
Storage Library Status Information  
Storage Library Unlabeled Surfaces  
Storage Library Unloads  
Storage Library Mount Requests  
Storage Library Mount Requests Information  
Storage Library Container Mount Requests Status  
Storage Library Container Pending Writes  
System Blackout Status  
System Core Files  
System Current Processes  
System HPII Confirm Files  
System Last Error Information  
System Number Current Processes  
System PPMNo Processes  
System SHM Usage  
System Snmp Information  
System System Status  
WorkFlo Ques Queue Count  
WorkFlo Ques Queue Error Count  
WorkFlo Ques Configuration File Information

ManageWare for FileNet Image Services also provides reports on the top CPU consumers so that if the application is experiencing a performance problem, the administrator can quickly identify abnormal situations and narrow down a list of possible causes or contributing factors. ManageWare for FileNet Image Services makes optimizing processing easier by helping the administrator go through the necessary steps:

Step 1 - Determine the application load: Determine peak usage times by gathering key performance metrics from the different application modules. ManageWare for FileNet Image Services collects data on each individual application module.

Step 2 - Determine resource consumption: Look for areas with high CPU utilization, memory, long running SQL, usage, and swap space utilization.

Step 3 - Perform trend analysis: Compare the resource consumption with the application load metrics using the multi-line graphing capability. This process will help the administrator to schedule the heavy-duty requests.

The administrator must also constantly monitor online users to determine if they are experiencing response time or other performance slowdowns. Understanding the performance that end users are experiencing is critical for managing and meeting service-level agreements. ManageWare for FileNet Image Services provides SQL end-to-end transaction response time monitoring. It gauges round-trip, end-to-end response time from a simulated FileNet Image Services client, by providing administrators with a measure of service-level compliance. Administrators are alerted when the connection to FileNet Image Services Applications cannot be made and they can track the typical transaction response time experienced by the end user.





## Conclusions

Managing a FileNet Image Services Applications environment is a complex task. This complexity can be attributed to the intricacy of the environment and of the application itself. ManageWare for FileNet Image Services Applications can make managing this system easier for administrators by automating and simplifying many of the routine management tasks.

ManageWare for FileNet Image Services provides single-point management where critical components of the environment, including the application servers, the database and the operating system, can be monitored from one place. It sends proactive alerts for faster identification of potential problems and makes it easier to solve problems by implementing automated recovery actions. This maximizes application availability to the business user. Proactive alerts and automated recovery actions also allow administrators to take fast actions to repair problems manually. ManageWare retains historical data and visually correlates data to simplify the complex tasks of planning for growth and ensure optimal performance of the system for end users.