APPLICATION NOTE
October 27, 2006

MAP Server Regular Maintenance and Backup Procedures

The purpose of this section is to discuss factors that affect optimum performance of a MAP Capture server, and make recommendations for performing regular maintenance on your Capture server to ensure that media capture continues uninterrupted, even during heavy CPU utilization.

During the normal course of operation, your MAP Capture server may suffer from the affects of low level operating system memory leaks, disk fragmentation, decreasing storage space, on-access virus scans and during automatic software updates. These can disrupt the operations of a system intended to operate 24/7/365. Therefore establishing a regular, periodic maintenance schedule, planning virus scans and putting Windows updates under your control increases the likelihood of trouble-free operation.

The following are suggested recommendations for the maintenance of your Capture servers. Use the information below to determine what works best within your organization and current server maintenance policies.

Warning! - You should never access a MAP Capture server via Windows Remote Desktop Connection. Doing so may cause the capture card's audio driver to bind to the remote session, and cause the Capture service encoder to fail.

Periodically Restart the Capture Server

Over time, the operating system on your MAP Capture server may have low-level memory leaks, leading the component to consume increasingly larger amounts of memory, reducing the amount of available memory may potentially destabilize the Capture server. It is recommended that you stop all capture activity and restart your MAP Capture server once per quarter (about 13 weeks).

Restarting the server frees unnecessary memory allocations, and will improve the capture card and platform stability, reducing the risk of failure.

Defragment Server Hard Drives

It is a good practice to periodically defragment your MAP Capture storage drive(s). While not an absolutely requirement, defragmenting the MAP Capture storage drive(s), and more importantly, keeping sufficient free space on the storage devices (for best performance never exceed 80% storage capacity), will keep the MAP Capture in its most efficient state.

When to defragment the MAP Capture storage drives is dependent on the size of the Capture storage drives and their available free space, the length and number of the typical segments and the type of expiration of media your Capture system utilizes.

While more an issue for read access a fragmented storage device can become increasingly inefficient over time. MAP Capture servers are constantly writing new media files to their storage, having media files read from their storage and having media files removed from their storage. If over time this constant read/write/delete process leads to a storage device's fragmentation increases to over 70% it is suggested that it be defragmented.

Note: To keep your storage devices in their best shape never exceed 80% capacity of the storage devices.

When to perform a defragmentation of MAP Capture storage is left up to each individual customer with a suggested defragmentation once per quarter (about 13 week).

Defragmentation is performed using utilities such as the Windows Disk Defragmentation utility, Diskeeper or other utility programs. Applications such as Diskeeper can even act dynamically keeping the disk in good shape as new files are written and/or deleted. However since Diskeeper will use some CPU cycles it is best to use such a utility only on servers that have available CPU overhead.

Defragmentation can be performed during capture, but be conscience of the CPU utilization. It is best to stay below the recommend 85% limit. CPU utilization during defragmentation is about 10-15%, but often exceeds this during certain operations, especially if the disk is heavily fragmented. If you cannot maintain CPU utilization to a safe level, take the Capture server offline and record your media on a backup Capture server or other system until defragmentation is complete and your Capture server is back on line.

IMPORTANT *- When calculating the storage needed for a capture server you must take into account that media files will be constantly written and deleted to the storage locations. Over time the disk will become fragmented. The affects of disk fragmentation are multiplied as the total storage space available reaches above 70%. The affects of fragmentation and low available disk space include sluggish O/S behavior and if left unchecked (high fragmentation and near peak storage capacity) could cause the server to be unresponsive. It is always good practice to allow for at least 50% additional storage space to mitigate the affects of the continual writing and deleting of media files. Multiple the absolute media storage requirements by 1.5X to arrive at the size of media storage needed for each server. Example: Four (4) live feeds captured 24/7 at 500kbps for 30 days requires 650GB of storage. The storage required for this Capture server would be 650GB X 1.5 =* ***975GB***

Disable Virus Scans and Software Updates

Virus scans, “on-access” real-time virus monitoring and Windows software updates may also impair normal operation of your Capture server.

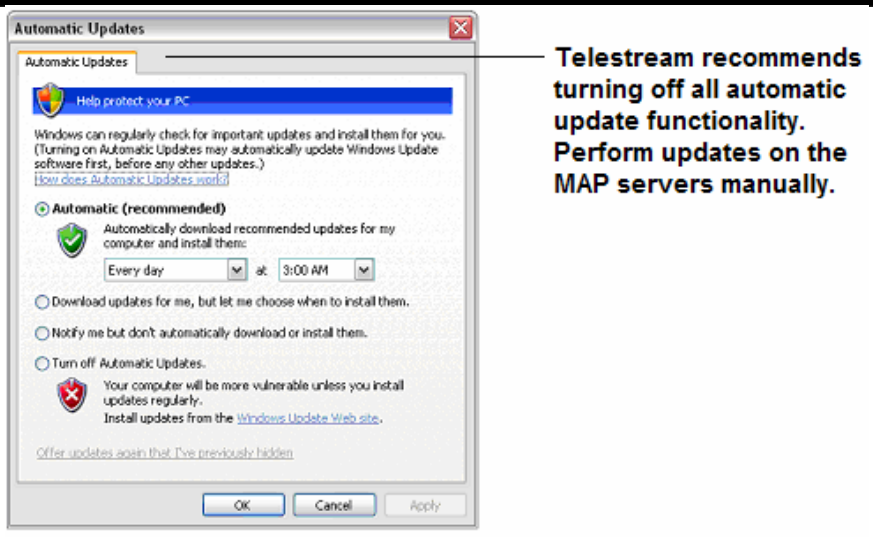
Virus Scans

Running a virus scan will increases CPU utilization. If you are using virus protection on your Capture server, make sure that if scans run during segment capture, CPU utilization does not increase above 85%. Alternatively, schedule the virus scan to run during a time when the Capture server is not recording segments.
If you decide not run virus software on your Capture server, you should consider isolating the Capture server from the corporate network on its own network, or completely firewall the server from the Internet to reduce risk of virus infection.

Note: Never run “on-access” real-time virus scanning on a MAP Capture server. When enable this type of virus scanning will process every new or modified file increasing the load on the servers CPUs.

Windows Software Updates.

Telestream recommends disabling automatic updates, or scheduling updates at a time when media recording is idle. File downloads that occur during software updates can push CPU utilization above the recommended 85% limit, and can also cause an automatic system reboot or other unintended change in Windows that may render some component of your Capture server inoperative, leading to potential media loss.
To display your Automatic Updates window, right-click start > and select Control Panel. In the Control Panel window, open Security Center and click Automatic Updates to display the Automatic Updates window.



Telestream recommends turning off automatic updates, and periodically performing updates according to your own IT policy.

Backup System Alternatives during Maintenance

If your operational requirements require continuous recording, consider the following alternatives as backup systems during the time your Capture server is offline for periodic maintenance.

Backup MAP Capture Server.
Install a second, identically-configured MAP Capture server. When you plan to perform scheduled maintenance on your MAP Capture server, switch your media feeds to the backup capture server and begin recording segments on it during the time your capture server is offline for maintenance.

Backup VCR Capture System.
Install a VCR for each channel you require recording. When you plan to perform scheduled maintenance on your MAP Capture server, switch your media feeds to VCR and record segments on it during the time your capture server is offline for maintenance.

Important Note: Microsoft operating systems provide methods to log and monitor server, application and service events. After-market system health monitoring software programs can also provide a central system monitor process to alert of server, application or service failures by proactively alerting operators of system and service degradations to prevent failures. It is highly recommended that MAP servers be included in a network wide server health monitoring process to augment MAP Alerts and EventReader notification.

Systems such as ManageEngine OpManager, iPMonitor and others can augment MAP Alerts and EventReader notification, providing the greater degree of system up time.

Systematic Backup of critical MAP system files

Periodical backup of critical MAP system files is essential to maintaining and projecting your MAP system against down time and loss of data. The following files need to be backed up as part of a standard system wide maintenance/backup program.

MAP Data files

Important Note: Backing up the entire MAP folder is recommended. The process of backing up the entire **%root%\Program Files\Telestream\MAP** folder will save all of the files and folders mentioned below. It is recommended that this folder be archived once per day as part a regular system wide backup policy.

Capture service file – This file contains data for all of the Channel definitions, schedules, descriptions/links to capture cards (video and audio), storage paths and other critical data needed for the MAP Capture server. It is located in the ..\Program Files\Telestream\MAP\Capture folder on all MAP servers running the MAP Capture service.

- **Capture.XML**

Content service files – The *Directory.XML* file and its backup files (*<day><AM/PM>.xml*) contain MAP Content folder definitions and properties. The *Catolog.WCI* folder contains indexed metadata for all MAP folders and binders, and is generated by the operating systems *Indexing* service. The location of this folder defaults to the MAP *Content* folder within the ..\Program Files\Telestream\MAP path. However this folder can reside in another location as directed by the Indexing service (*see Computer Management -> Services and Applications -> Indexing Service -> MAP*). The *Cache* folder contains data for each unique MAP binder on the MAP Content server. Each binder's data is contained within unique data files and is represented as a file with a naming structure of *<{binder UUID}>.content*. Binder properties and data including storage locations, archive/restore data, metadata, version info and other critical MAP binder data are contained within these files. The default location for all of these files and folder is *..\Program Files\Telestream\MAP\Content* folder of MAP servers running the MAP Content service.

- **Directory.XML**
- **SunAM.XML**
- **SunPM.XML**
- **MonAM.XML**
- **MonPM.XML**
- **TueAM.XML**
- **TuePM.XML**
- **WedAM.XML**
- **WedPM.XML**
- **ThuAM.XML**
- **ThuPM.XML**
- **FriAM.XML**
- **FriPM.XML**
- **SatAM.XML**
- **SatPM.XML**
- **Contents of Catolog.WCI folder**
- **Contents of Cache folder**

Factory service files – The *Factory.XML* file contains all data describing MAP Factory setup. Critical data includes storage locations, portal definitions and other critical MAP Factory data. It is located in the *..\Program Files\Telestream\MAP\Factory* folder of servers running the MAP Factory service.

- **Factory.XML**

MAP Registry entries

The data contained within the following registry keys should be backed up periodically for each MAP server in a MAP system.

- *HKEY_LOCAL_MACHINE\SOFTWARE\Telestream*
- *HKEY_CURRENT_USER\ SOFTWARE \Telestream*

Important Note: MAP is a networked system that utilizes both Telestream and non-Telestream software applications/operating system services. Within this document and the ***MAP ICM Guide*** non-Telestream software applications/operating system services will be described and configured for uses within the scope of the MAP system. Every effort will be made to provide the necessary information and documentation to allow those responsible for administering the MAP system with knowledge as to how non-Telestream software applications/operating system services are utilized/configured within the system as a whole. It is the responsibility of the MAP system customer to understand the overall operation of non-Telestream software applications/operating system services where they apply outside of the scope of the MAP system interaction.