Using the Cisco Video Surveillance Monitoring Workstation Profiler Tool, Release 7

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This guide describes how to use the Cisco Video Surveillance Workstation Profiler Tool (Profiler Tool) to analyze the ability of a PC client to render video using Cisco VSM 7.0 or higher.

Contents

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Overview

The Cisco Video Surveillance Workstation Profiler Tool (Profiler Tool) is a stand-alone Windows utility that validates and predicts the ability of a PC client to render video.

Workstation hardware and software strongly affects the ability of a workstation to play video. The Profiler Tool characterizes your workstation's hardware and software capabilities and limitations, allowing you to make the workstation adjustments that are optimal for your operational environment.

The Profiler Tool provides a consistent means of measuring not only how well the workstation can display video in general, but also how well it performs under different conditions.

When To Run The Test

To establish a baseline, you first run the Profiler Tool to take measurements right after the workstation is booted and no other applications have consumed system resources. Run the tool again during normal operation when other tools and applications are running.

Examining the differences in performance between the baseline and normal measurements allows you decide how to configure your workstation to strike the best balance between video rendering performance and operational convenience. For example, you may learn that you can continue to run a particular application you need to use because it does not have a major on performance, or you may learn that you need to run the application on a different system because it does have a major impact.

Overall, the Profiler Tool help your stream profiles and workstations that best fit together. You can eliminate issues before they occur and help troubleshoot problems that do occur.

What the Profiler Tool Does and Does Not Do

The Profiler Tool is designed to perform specific tests.

It DOES:

- Summarize the workstation hardware and software attributes.
- Tell the ability of the workstation to successfully display a variety of video clips from different codecs and multiple panes.
- Identify issues or possible causes of concern that may affect the workstation's ability to render video.

It DOES NOT:

- Evaluate network throughput
- Validate video quality

See the "Caveats" section on page 17 for more information.

System Requirements

You can download and run the Profiler Tool on any PC that meets the system requirements described in the Cisco Video Surveillance Monitoring Workstation Performance Baseline Specification.

After running initial baseline and operational tests, compare the results to determine whether you need to modify the workstation's operational configuration to improve performance.

Restrictions for Laptops With i3 or i5 Processors

Computers with Intel i3 or i5 processors experience poor performance when running 5x5 video views, including high CPU usage and low frames per second. x5 layouts may be skipped when running the Profiler Tool on these computers.

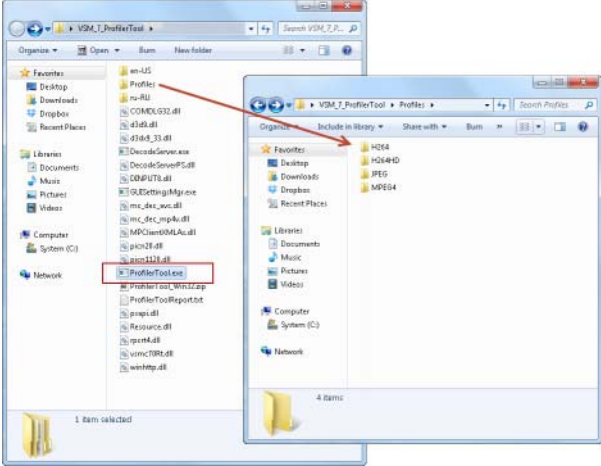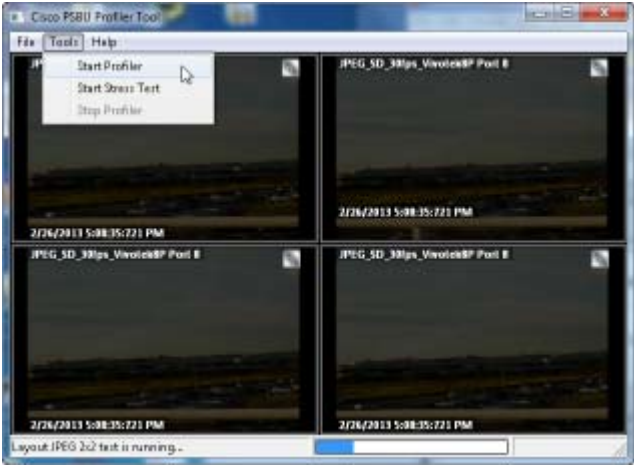# Summary Steps

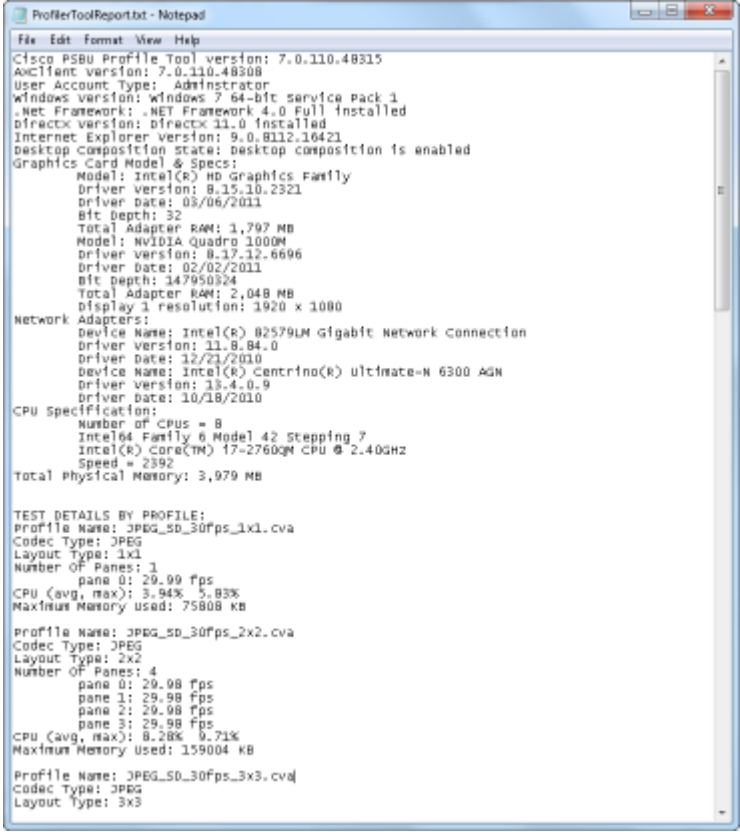*Table 1*　　　　*Summary Steps: Profiler Tool*

	Task	Description
Step 1	Download and extract the Profiler Tool and sample video files. **Note**　The sample video files are placed in the Profiles directory in the same location as the Profiler Tool.	See the "Installing the Profiler Tool and Sample Video Files" section on page 6.
Step 2	Double click `ProfilerTool.exe` and choose **Tools > Start Profiler** to run a workstation test.	See the "Running a Profile Test" section on page 8. See also the following: • System Requirements, page 3 • Creating Baseline and Operational Profiles, page 16

Table 1   *Summary Steps: Profiler Tool (continued)*

	Task	Description
Step 3	Wait for the test to complete and the `ProfilerToolReport.txt` to appear.	See the "Running a Profile Test" section on page 8 to understand how long the test can take.
Step 4	Review the test report to identify system performance, system requirements and other possible issues that impact performance.	See the "Understanding the Test Results" section on page 11.

See also the following:

- Caveats, page 17

- Creating Baseline and Operational Profiles, page 16

- Sample Test Results, page 18

# Installing the Profiler Tool and Sample Video Files

The Profiler Tool is distributed in a `.ZIP` archive file that contains the `ProfilerTool.exe` executable file.

Usage Notes

The Profiler Tool tests the workstation capabilities by playing the video files that are added to the "Profiles" directory located in the same directory as the Profiler Tool

- The sample video files must downloaded and extracted to the "Profiles" directory (located in the same directory as the Profiler Tool), as shown in Figure 1.

- Sample files are available in the H264, H264HD, JPEG, MPEG formats and include 1x1, 2x2, 3x3 and 4x4 layouts. Download and extract the file formats required for testing by your deployment

- We recommend including all 4 layouts for complete workstation analysis.

- Any missing file formats or layouts are skipped and not included in the results. See the "Understanding the Test Results" section on page 11.

Figure 1   Sample Video Files in the "Profiles" Directory
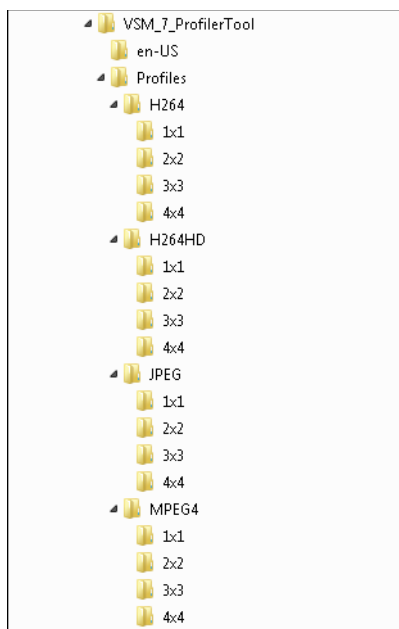
Procedure

Step 1   Use a web browser to access the Cisco Video Surveillance Manager product page.

Step 2   Click Download Software.

Step 3   Select **Video Surveillance Manager Stand-alone Tools**.

Step 4   Select **Release 7.0.1** (Figure 2).

Figure 2　　　*Profiler Tool Download Page*
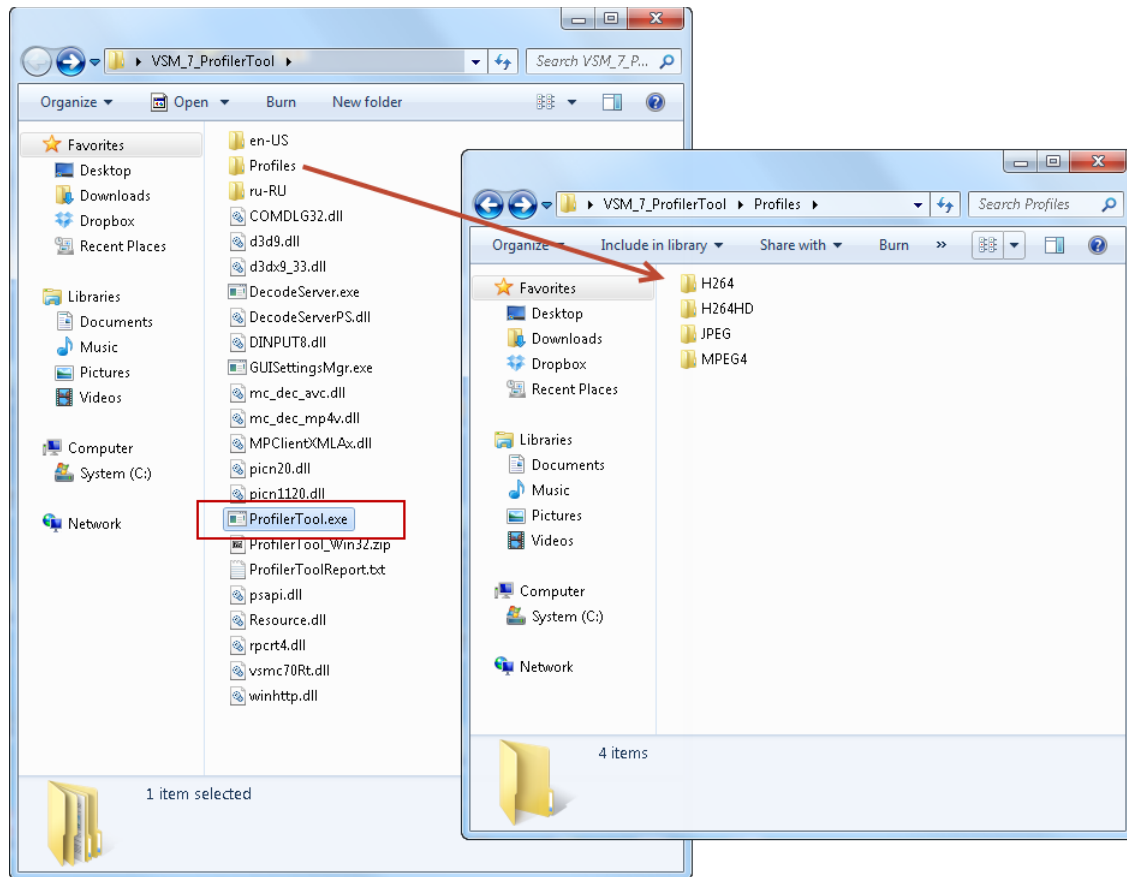

Step 5　Download the "Cisco Video Surveillance Workstation Profile Tool" and extract it to a local directory, such as \ProfilerTool.

Step 6　Download and extract the "Profile Tool Clips" to the same directory (Figure 3).

Figure 3 **Profiler Tool Directory**

✎ **Note** Each of the "Profile" video sample codecs (H264, H264HD, JPEG, MPEG4) includes a set of video files in 1x1, 2x2, 3x3 and 4x4 layouts. These files are used by the Profiler Tool to analyze the ability of your workstation to process video. Include the codecs required by your deployment. Any missing files are skipped.

Running a Profile Test

There are two profile tests: a regular test that skips the remaining layouts for a codec if any layout tests fails, and the Stress test that tests all layouts for all codecs.

Procedure

Step 1 Determine if you want to test the workstation in baseline or operational mode.

See the "Creating Baseline and Operational Profiles" section on page 16.

Step 2 Launch the ProfilerTool.exe from the directory where you extracted the tool and video profiles (Figure 3).

Step 3 Click **Tools** and start the test as described in Table 2 (see also Figure 4):

> **Note** Any missing file format or layout directory is skipped. For example, if the MPEG4 directory is missing, the test proceeds to H264 after completing JPEG. If the 2x2 layout in JPEG directory is missing, the test proceeds to the JPEG 3x3 layout after completing 1x1.

Table 2   *Test Options in the "Tools" Menu*

"Tools" Menu Option	Test Type	Description
Start Profiler	Regular test	Runs each of the video profiles in succession for 1 minute. • If a video clip fails the profile test, then all remaining clips for that codec are skipped. • For example, if the 1x1 H264HD video clip fails, then the Profiler Tool assumes the other H264HD layouts (2x2, 3x3, and 4x4) will also fail since the additional layouts for that codec will require even more processing power. **Note** A failed test occurs when CPU usage is over 90% or frames-per-second (fps) is 20% below the target frame rate. For example, a fps 30 video clip has a pass threshold of 24 fps. See the "Understanding the Test Results" section on page 11.
Start Stress Test	Stress test	All video profiles included in the Profiles folder are run even if one or more clips fails. For example, if the 1x1 H264HD video clip fails, the Profiler Tool still tests the remaining H264HD layouts (2x2, 3x3, and 4x4), allowing you to view the results for each test.
Stop Profiler	Stop the test	Stop a running profile test. Incomplete results will be displayed in the `ProfilerToolReport.txt` report.

Figure 4   *Profile Test Options*
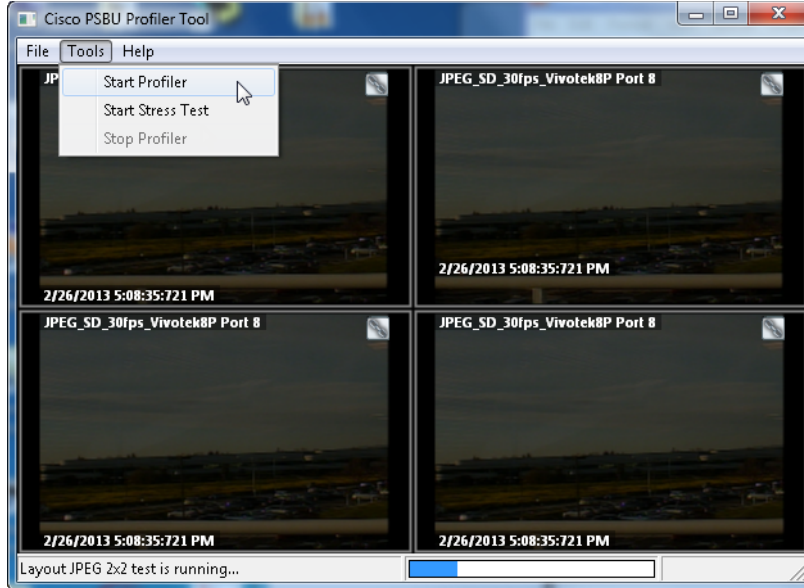
Step 4   Wait for all tests to complete.

- The test for each layout takes 1 minute to complete.

- Each codec (JPEG, MPEG4, H264, H264HD) includes video clips for four layouts: 1x1, 2x2, 3x3, and 4x4. It takes 16 minutes for all tests to run. Less time is required if a tests fails using the regular test (since additional layouts for that codec are skipped) or if you choose **Stop Profiler** before testing is complete.

Step 5   Continue to "Understanding the Test Results".

Understanding the Test Results

The test results are displayed in the `ProfilerToolReport.txt` file that is automatically created at the end of the test. The report includes three major sections:

Table 3   Sections in the ProfilerToolReport.txt File

Report Section	Description	More Information
System Profile	A system profile that lists the major hardware and software characteristics of the workstation.	System Profile, page 12
Test Details By Profile	The frames-per-second (fps) and CPU usage for each valid codec and layout included in the "Profiles" directory.	Test Details By Profile, page 13
Issues	How You Know that Your Tests Succeeded	Issues, page 16

Tip   The `ProfilerToolReport.txt` report is automatically created and saved to the Profiler Tool directory. Choose **File > Save As** to save the file to another name to compare against additional tests.

The Profiler Tool measures successful playback for a given video pane using the following criteria:

- The pane can successfully access the video file
- The pane can successfully play the video file
- The pane can successfully render at least 80% of the nominal video frame rate
- CPU usage is under 90%

Additional criterion for layout success:

- All videos in a layout are rendered successfully

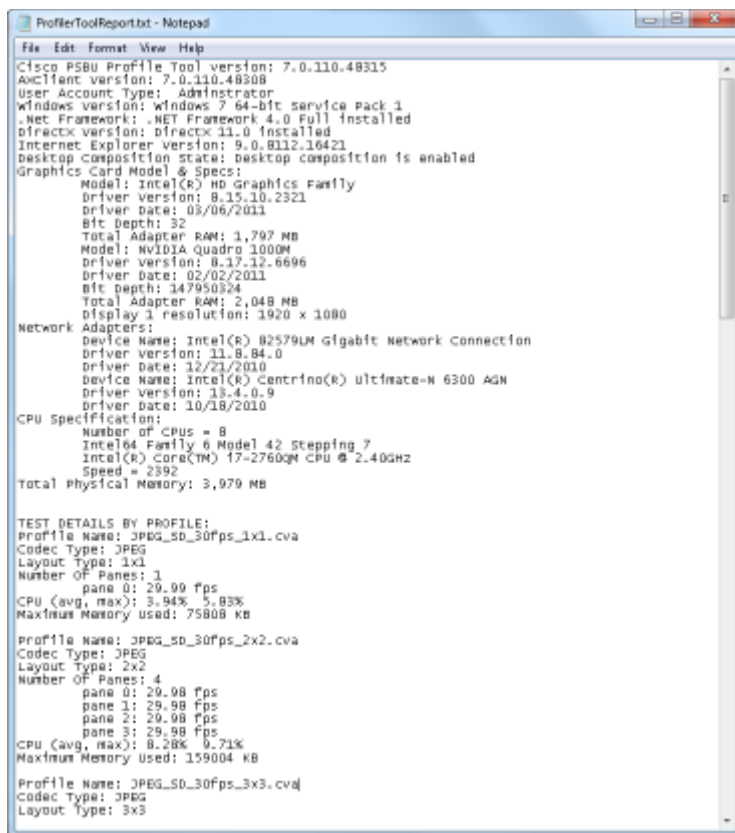**Note**   • If a layout fails, all subsequent layouts for that profile are skipped unless you selected the **Stress Test**.

- Any missing or mis-named directories or sample video files are skipped and not included in the results. See the "Installing the Profiler Tool and Sample Video Files" section on page 6 for more information.

Tip   See the "Caveats" section on page 17 for more information.

Figure 5   *Profiler ToolReport*

System Profile

Review the system profile at the top of the `ProfilerToolReport.txt` output to verify that the workstation meets the basic system requirements. Compare the system profile with the requirements described in the Cisco Video Surveillance Monitoring Workstation Performance Baseline Specification.

The following example shows the system profile included at the top of the `ProfilerToolReport.txt` output:

```
Cisco PSBU Profiler Tool version: 7.0.110.48315
AXClient Version: 7.0.110.48308
User Account Type:  Administrator
Windows Version: Windows 7 64-bit Service Pack 2
.Net Framework: .NET Framework 4.0 Full installed
DirectX Version: DirectX 11.0 installed
Internet Explorer Version: 9.0.8112.16421
Desktop Composition State: Desktop composition is enabled
Graphics Card Model & Specs:
    Model: Intel(R) HD Graphics Family
    Driver Version: 8.15.10.2321
    Driver Date: 03/06/2011
    Bit Depth: 32
    Total Adapter RAM: 1,797 MB
    Model: NVIDIA Quadro 1000M
    Driver Version: 8.17.12.6696
    Driver Date: 02/02/2011
```

```
        Bit Depth: 5168428
        Total Adapter RAM: 2,048 MB
        Display 1 resolution: 1920 x 1080
Network Adapters:
        Device Name: Intel(R) 82579LM Gigabit Network Connection
        Driver Version: 11.8.84.0
        Driver Date: 12/21/2010
        Device Name: Intel(R) Centrino(R) Ultimate-N 6300 AGN
        Driver Version: 13.4.0.9
        Driver Date: 10/18/2010
CPU Specification:
        Number of CPUs = 8
        Intel64 Family 6 Model 42 Stepping 7
        Intel(R) Core(TM) i7-2760QM CPU @ 2.40GHz
        Speed = 2392
Total Physical Memory: 3,979 MB
```

Review this information to verify that the workstation supports the specification in the Cisco Video Surveillance Monitoring Workstation Performance Baseline Specification.

Test Details By Profile

The test results are shown for each "Profile Name", which is the video file being tested.

✎
Note
- If a layout fails, all subsequent layouts for that profile are skipped unless you selected the **Stress Test**.
- Any missing or mis-named directories or sample video files are skipped and not included in the results. See the "Installing the Profiler Tool and Sample Video Files" section on page 6 for more information.

The following example shows the test results for the `JPEG_SD_30fps_1x1.cva` standard-definition JPEG video file that should play at 30 frame per second in a 1x1 layout (meaning there is only a single pane of video). These results show the fps that actually played for this video layout, the percentage of CPU processing capacity consumed during the playback, and the amount of memory used during the playback.

```
Profile Name: JPEG_SD_30fps_1x1.cva
Codec Type: JPEG
Layout Type: 1x1
Number Of Panes: 1
    pane 0: 29.99 fps
CPU (avg, max): 3.11%  4.68%
Maximum Memory Used: 126556 KB
```

The following table describes each field in the profile results.

Table 4   *Test Result Details*

Field	Description
Profile Name	The file name of the video file being tested.
Codec Type	The video codec: JPEG, MPEG4, H264, or H264HD

Table 4   *Test Result Details (continued)*

Field	Description
Layout Type	The display layout.: 1x1, 2x2, 3x3 or 4x4. A test is run for each layout included for the codec.
Number Of Panes	The number of video panes included in the layout. For example, a 1x1 layout includes a single video pane. A 4x4 layout included 16 video panes.

pane x	The frames-per-second (fps) that actually played for each video pane in the layout.
	
	 The following successful test shows a 2x2 layout with 4 video panes:
	
	 ``` Number Of Panes: 4 pane 0: 29.98 fps pane 1: 29.99 fps pane 2: 29.99 fps pane 3: 29.99 fps ```
	 The pane must successfully render at least 80% of the nominal video frame rate for the test to pass. If the test fails, the remaining layouts for the codec are skipped, unless you choose the **Stress Test** option (see the "Running a Profile Test" section on page 8 for more information).
	
	 In the following example, the test fails because the frame rate for one or more panes is below 80% of the nominal 30 fps for the clip.
	
	 ``` Profile Name: H264_HD_30fps_3x3.cva Codec Type: H264HD Layout Type: 3x3 Number Of Panes: 9 pane 0: 18.94 fps pane 1: 15.06 fps pane 2: 20.38 fps pane 3: 13.46 fps pane 4: 20.11 fps pane 5: 21.40 fps pane 6: 20.05 fps pane 7: 22.04 fps pane 8: 12.45 fps CPU (avg, max): 38.78% 85.18% Maximum Memory Used: 658116 KB ```

Table 4   *Test Result Details (continued)*

Field	Description
pane x	The frames-per-second (fps) that actually played for each video pane in the layout.

The following successful test shows a 2x2 layout with 4 video panes:

```
Number Of Panes: 4
    pane 0: 29.98 fps
    pane 1: 29.99 fps
    pane 2: 29.99 fps
    pane 3: 29.99 fps
```

The pane must successfully render at least 80% of the nominal video frame rate for the test to pass. If the test fails, the remaining layouts for the codec are skipped, unless you choose the **Stress Test** option (see the "Running a Profile Test" section on page 8 for more information).

In the following example, the test fails because the frame rate for one or more panes is below 80% of the nominal 30 fps for the clip.

```
Profile Name: H264_HD_30fps_3x3.cva
Codec Type: H264HD
Layout Type: 3x3
Number Of Panes: 9
    pane 0: 18.94 fps
    pane 1: 15.06 fps
    pane 2: 20.38 fps
    pane 3: 13.46 fps
    pane 4: 20.11 fps
    pane 5: 21.40 fps
    pane 6: 20.05 fps
    pane 7: 22.04 fps
    pane 8: 12.45 fps
CPU (avg, max): 38.78%  85.18%
Maximum Memory Used: 658116 KB
```

Table 4   ***Test Result Details (continued)***

Field	Description
Maximum Memory Used	The maximum amount of memory used during the text of the video file (in KB).

Issues

The ISSUES section at the end of the report displays issues that should be addressed to improve performance. For example:

```
ISSUES:
Graphics card driver for Intel(R) HD Graphics Family is 745 days old
Graphics card driver for NVIDIA Quadro 1000M  is 777 days old
Network adapter driver for Intel(R) 82579LM Gigabit Network Connection is 820 days old
Network adapter driver for Intel(R) Centrino(R) Ultimate-N 6300 AGN is 884 days old
AXClient not installed
```

Issues include possible items flagged by the system that may or may not impact system performance and test results.

For example:

- The graphics card or network card driver is out of date:
    - 6 months = marginally out of date
    - 1 year = significantly out of date
    - 2+ years = extremely out of date
- The Internet Explorer web browser is the wrong version.
- The ActiveX Client is not installed.

See the "System Requirements" section on page 3 for more information.

Creating Baseline and Operational Profiles

We strongly recommend that you take a baseline profile of your system to determine an upper bound on the ability of your workstation to play video. The baseline profile is taken with all applications and services that are not essential to run your system turned off, and then saved for later reference.

You can then turn on the applications and services again and run profiles again. If the measurements you get are significantly lower than the baseline, you can turn non-critical applications and services off selectively until you are able to achieve acceptable measurements.

In particular, note that following applications and services may have a significant impact on performance:

- Backup, restoring, and archiving processes
- Anti-virus software
- Any other software that requires significant processor resources

✎
Note   Firewalls do not affect performance and do not need to be turned off for the baseline measurements.

Procedure

To create a baseline or operational profile, follow these steps:

Step 1 Gather any sample profile clips that you want to use as part of the baseline profile.

Step 2 Log into your workstation as administrator.

Step 3 Turn off applications and services:

– If you are running a baseline profile, turn off all applications and services that are not essential to running your workstation, and reboot your system.

– If you are running an operational profile, turn off all the applications that are not needed for normal operation, and reboot your system.

Step 4 Extract all the contents of the Profiler Tool .zip archive (see the "Installing the Profiler Tool and Sample Video Files" section on page 6).

Step 5 Complete the profile test as described in the "Running a Profile Test" section on page 8.

Step 6 Interpret the test results as described in the "Understanding the Test Results" section on page 11.

Step 7 (Optional) Click **Save As** and save the results to a text file.

Step 8 (Optional) Revise the workstation hardware or software attributes to align with the requirements defined in the Cisco Video Surveillance Monitoring Workstation Performance Baseline Specification.

Step 9 (Optional) Repeat this procedures to compare the results with the previous test.

Caveats

Many factors combine in complex ways to produce the quality of experience for displayed video. Because the Profiler Tool is a stand-alone utility that uses local clip files, it cannot guarantee that video streams over the network will play properly. It cannot determine the visual quality of video; therefore, it displays video for you to examine visually while the test are running.

The following specific factors are outside the measurement and prediction scope of the Profiler Tool.

- Cannot alter the CPU usage on your workstation. To improve performance, you must make hardware or software adjustments based on the baseline and operational test results.
- Cannot validate video quality.
- Does not determine the smoothness of play back.
- Does not report number of dropped frames.
- Cannot evaluate network throughput.
- Only .CVA video files are supported. The Profiler Tool does not test video from other formats.
- Can estimate, but not calculate precisely, the overall performance within a Operations Manager interface running in a browser.
- Cannot predict interactions with applications that are not part of the test.
- Can save test result details only for the currently completed test.

Sample Test Results

The following sample test results include a summary of the test results, workstation details, possible issues that may affect video performance, and detailed test results. See the "Understanding the Test Results" section on page 11 for more information.

```
Cisco PSBU Profiler Tool version: 7.0.110.48315
AXClient Version: AXClient not installed
User Account Type:  Administrator
Windows Version: Windows 7 64-bit Service Pack 1
.Net Framework: .NET Framework 4.0 Full installed
DirectX Version: DirectX 11.0 installed
Internet Explorer Version: 9.0.8112.16421
Desktop Composition State: Desktop composition is enabled
Graphics Card Model & Specs:
    Model: Intel(R) HD Graphics Family
    Driver Version: 8.15.10.2321
    Driver Date: 03/06/2011
    Bit Depth: 32
    Total Adapter RAM: 1,797 MB
    Model: NVIDIA Quadro 1000M
    Driver Version: 8.17.12.6696
    Driver Date: 02/02/2011
    Bit Depth: 5863948
    Total Adapter RAM: 2,048 MB
    Display 1 resolution: 1920 x 1080
Network Adapters:
    Device Name: Intel(R) 82579LM Gigabit Network Connection
    Driver Version: 11.8.84.0
    Driver Date: 12/21/2010
    Device Name: Intel(R) Centrino(R) Ultimate-N 6300 AGN
    Driver Version: 13.4.0.9
    Driver Date: 10/18/2010
CPU Specification:
    Number of CPUs = 8
    Intel64 Family 6 Model 42 Stepping 7
    Intel(R) Core(TM) i7-2760QM CPU @ 2.40GHz
    Speed = 2392
Total Physical Memory: 3,979 MB


TEST DETAILS BY PROFILE:
Profile Name: JPEG_SD_30fps_1x1.cva
Codec Type: JPEG
Layout Type: 1x1
Number Of Panes: 1
    pane 0: 29.99 fps
CPU (avg, max): 3.11%  4.68%
Maximum Memory Used: 126556 KB

Profile Name: JPEG_SD_30fps_2x2.cva
Codec Type: JPEG
Layout Type: 2x2
Number Of Panes: 4
    pane 0: 29.98 fps
    pane 1: 29.99 fps
    pane 2: 29.99 fps
    pane 3: 29.99 fps
CPU (avg, max): 5.68%  7.84%
Maximum Memory Used: 188724 KB

Profile Name: JPEG_SD_30fps_3x3.cva
```

```
Codec Type: JPEG
Layout Type: 3x3
Number Of Panes: 9
    pane 0: 29.99 fps
    pane 1: 29.97 fps
    pane 2: 29.99 fps
    pane 3: 29.99 fps
    pane 4: 29.97 fps
    pane 5: 29.99 fps
    pane 6: 29.99 fps
    pane 7: 29.99 fps
    pane 8: 29.97 fps
CPU (avg, max): 16.16%  20.58%
Maximum Memory Used: 301600 KB


Profile Name: JPEG_SD_30fps_4x4.cva
Codec Type: JPEG
Layout Type: 4x4
Number Of Panes: 16
    pane 0: 29.98 fps
    pane 1: 29.98 fps
    pane 2: 29.98 fps
    pane 3: 29.98 fps
    pane 4: 29.97 fps
    pane 5: 29.98 fps
    pane 6: 29.97 fps
    pane 7: 29.97 fps
    pane 8: 29.98 fps
    pane 9: 29.98 fps
    pane 10: 29.97 fps
    pane 11: 29.98 fps
    pane 12: 29.97 fps
    pane 13: 29.98 fps
    pane 14: 29.97 fps
    pane 15: 29.98 fps
CPU (avg, max): 29.46%  40.88%
Maximum Memory Used: 461288 KB


Profile Name: MPEG4_SD_30fps_1x1.cva
Codec Type: MPEG4
Layout Type: 1x1
Number Of Panes: 1
    pane 0: 29.43 fps
CPU (avg, max): 5.09%  6.09%
Maximum Memory Used: 155900 KB


Profile Name: MPEG4_SD_30fps_2x2.cva
Codec Type: MPEG4
Layout Type: 2x2
Number Of Panes: 4
    pane 0: 29.42 fps
    pane 1: 29.42 fps
    pane 2: 29.42 fps
    pane 3: 29.42 fps
CPU (avg, max): 10.00%  11.78%
Maximum Memory Used: 243972 KB


Profile Name: MPEG4_SD_30fps_3x3.cva
Codec Type: MPEG4
Layout Type: 3x3
Number Of Panes: 9
    pane 0: 29.37 fps
    pane 1: 29.37 fps
    pane 2: 29.37 fps
```

```
    pane 3: 29.37 fps
    pane 4: 29.37 fps
    pane 5: 29.37 fps
    pane 6: 29.37 fps
    pane 7: 29.37 fps
    pane 8: 29.37 fps
CPU (avg, max): 27.31%  35.22%
Maximum Memory Used: 387676 KB


Profile Name: MPEG4_SD_30fps_4x4.cva
Codec Type: MPEG4
Layout Type: 4x4
Number Of Panes: 16
    pane 0: 23.80 fps
    pane 1: 23.82 fps
    pane 2: 23.81 fps
    pane 3: 23.82 fps
    pane 4: 23.81 fps
    pane 5: 23.83 fps
    pane 6: 23.83 fps
    pane 7: 23.81 fps
    pane 8: 23.82 fps
    pane 9: 23.82 fps
    pane 10: 23.82 fps
    pane 11: 23.81 fps
    pane 12: 23.83 fps
    pane 13: 23.84 fps
    pane 14: 23.83 fps
    pane 15: 23.81 fps
CPU (avg, max): 22.14%  64.67%
Maximum Memory Used: 468300 KB


Profile Name: H264_SD_30fps_1x1.cva
Codec Type: H264
Layout Type: 1x1
Number Of Panes: 1
    pane 0: 29.39 fps
CPU (avg, max): 3.49%  4.19%
Maximum Memory Used: 170336 KB


Profile Name: H264_SD_30fps_2x2.cva
Codec Type: H264
Layout Type: 2x2
Number Of Panes: 4
    pane 0: 29.39 fps
    pane 1: 29.39 fps
    pane 2: 29.39 fps
    pane 3: 29.39 fps
CPU (avg, max): 5.32%  6.60%
Maximum Memory Used: 254080 KB


Profile Name: H264_SD_30fps_3x3.cva
Codec Type: H264
Layout Type: 3x3
Number Of Panes: 9
    pane 0: 29.35 fps
    pane 1: 29.36 fps
    pane 2: 29.36 fps
    pane 3: 29.37 fps
    pane 4: 29.36 fps
    pane 5: 29.37 fps
    pane 6: 29.36 fps
    pane 7: 29.37 fps
    pane 8: 29.37 fps
```

```
CPU (avg, max): 12.21%  16.18%
Maximum Memory Used: 393984 KB


Profile Name: H264_SD_30fps_4x4.cva
Codec Type: H264
Layout Type: 4x4
Number Of Panes: 16
    pane 0: 29.24 fps
    pane 1: 29.31 fps
    pane 2: 29.33 fps
    pane 3: 29.33 fps
    pane 4: 29.33 fps
    pane 5: 29.31 fps
    pane 6: 29.33 fps
    pane 7: 29.33 fps
    pane 8: 29.31 fps
    pane 9: 29.33 fps
    pane 10: 29.33 fps
    pane 11: 29.33 fps
    pane 12: 29.31 fps
    pane 13: 29.33 fps
    pane 14: 29.24 fps
    pane 15: 29.31 fps
CPU (avg, max): 29.97%  39.74%
Maximum Memory Used: 587036 KB


Profile Name: H264_HD_30fps_1x1.cva
Codec Type: H264HD
Layout Type: 1x1
Number Of Panes: 1
    pane 0: 29.40 fps
CPU (avg, max): 4.89%  5.91%
Maximum Memory Used: 210304 KB


Profile Name: H264_HD_30fps_2x2.cva
Codec Type: H264HD
Layout Type: 2x2
Number Of Panes: 4
    pane 0: 29.15 fps
    pane 1: 29.15 fps
    pane 2: 29.15 fps
    pane 3: 29.15 fps
CPU (avg, max): 33.02%  39.35%
Maximum Memory Used: 390524 KB


Profile Name: H264_HD_30fps_3x3.cva
Codec Type: H264HD
Layout Type: 3x3
Number Of Panes: 9
    pane 0: 18.94 fps
    pane 1: 15.06 fps
    pane 2: 20.38 fps
    pane 3: 13.46 fps
    pane 4: 20.11 fps
    pane 5: 21.40 fps
    pane 6: 20.05 fps
    pane 7: 22.04 fps
    pane 8: 12.45 fps
CPU (avg, max): 38.78%  85.18%
Maximum Memory Used: 658116 KB



ISSUES:
```

```
Graphics card driver for Intel(R) HD Graphics Family is 745 days old
Graphics card driver for NVIDIA Quadro 1000M  is 777 days old
Network adapter driver for Intel(R) 82579LM Gigabit Network Connection is 820 days old
Network adapter driver for Intel(R) Centrino(R) Ultimate-N 6300 AGN is 884 days old
AXClient not installed
```

Related Documentation

- Cisco Video Surveillance Monitoring Workstation Performance Baseline Specification

- See the Cisco Video Surveillance 7 Documentation Roadmap for descriptions and links to Cisco Video Surveillance documentation, server and storage platform documentation, and other related documentation.