

TRANSFORM

Increase number of concurrent processes

BOTTOMLINE TRANSFORM SUPPORT



By Colin Avery

19th September 2020

CONTENTS

- Introduction
- Problem
- Before you start
- Configure desktop heap
- Add additional input ports



INTRODUCTION

This document provides step-by-step instructions for modifying the Windows desktop heap configuration to support a larger number of non-interactive processes running simultaneously on your system.

What is the Windows Desktop Heap?

The Windows desktop heap is a specific area of system memory that Windows allocates for managing user interface elements and processes. Every process that runs on Windows, whether it has a visible user interface or not, consumes a portion of this heap memory. Non-interactive processes such as background services, automated tasks, and server applications like Transform Queue processes still require desktop heap space even though users don't directly interact with them.

Why Might You Need to Increase the Desktop Heap?

By default, Windows sets conservative limits on desktop heap size to ensure system stability and prevent any single application from consuming too much memory. However, these default settings can become a bottleneck in enterprise environments or specialized applications where you need to run many background processes concurrently. When the desktop heap reaches its capacity, Windows will refuse to start new processes, even if your system has plenty of available RAM. This can result in processes failing to launch without clear error messages, making it difficult to diagnose the root cause of the problem.

When This Configuration is Necessary?

You'll typically need to adjust these settings when you're planning to deploy multiple instances of applications like Transform Queue processes, or when you're running other software that creates numerous background processes. Signs that you may need to increase the desktop heap includes processes that fail to start intermittently, especially when multiple processes are launched simultaneously, or when you notice that some processes start successfully while others remain stuck in a pending state.

The configuration steps outlined in this document will help you optimize your Windows environment to handle higher process loads more effectively.

This document explores the following subjects: -

- Problem
- Modify the Windows desktop heap
- Test Processes

PROBLEM

When you deploy a Transform Process to a Runtime server, the system creates a new **fsproc.exe** process that will appear in your **Windows** Task Manager's process list. This is completely normal behavior and indicates that your queue process is deployed and is ready to process.

Here's what's important to understand about how these processes work: Each deployed Transform Queue process runs as its own **fsproc.exe** instance, and these processes are allocated within a specific area of system memory called the **Desktop Heap**. While each individual process doesn't consume a large amount of memory from this heap, the memory usage does add up when you're running multiple processes simultaneously.

This can become a silent issue if you're planning to run many Transform Processes at the same time. There are several scenarios where it is necessary to check the Desktop Heap setting:

- Intermittent **fsync.exe** process crashing in the event viewer.
- Large input files to Transform with hundreds of pages giving blank or missing outputs.
- Unexpected stalling of Transform, if code fails due to lack of resources, then the event viewer will show errors such as 'Allocate Memory failed attempting to allocate 0x0 : ### bytes, possible lack of disk space'. This happens even though the physical memory on the drives is sufficient.
- Jobs getting stuck in the queues.

To monitor whether your processes are running, you have a couple of reliable methods to check their status:

- First, you can navigate to the Transform Administrator Status page, which will show you the current state of all your deployed processes. This gives you a clear overview of which processes are active, and which might be experiencing issues.
- Second, if you've configured your Queue Process to function as a print queue, you can verify its status by checking the **Windows** Printers list on your Transform server. When processes are deployed and running correctly, they'll appear as individual printers in this list, making it easy to confirm that everything is working as expected.

If you're planning to deploy multiple concurrent processes, it's worth keeping an eye on these indicators to ensure your system resources can handle the load effectively.

Description

For the following OSs, warning events may be displayed in the Windows Event Viewer, System event logs.

- Windows Server 2008
- Windows Server 2012
- Windows Server 2016

Event Source: Win32k
Event ID: 243
A desktop heap allocation failed.

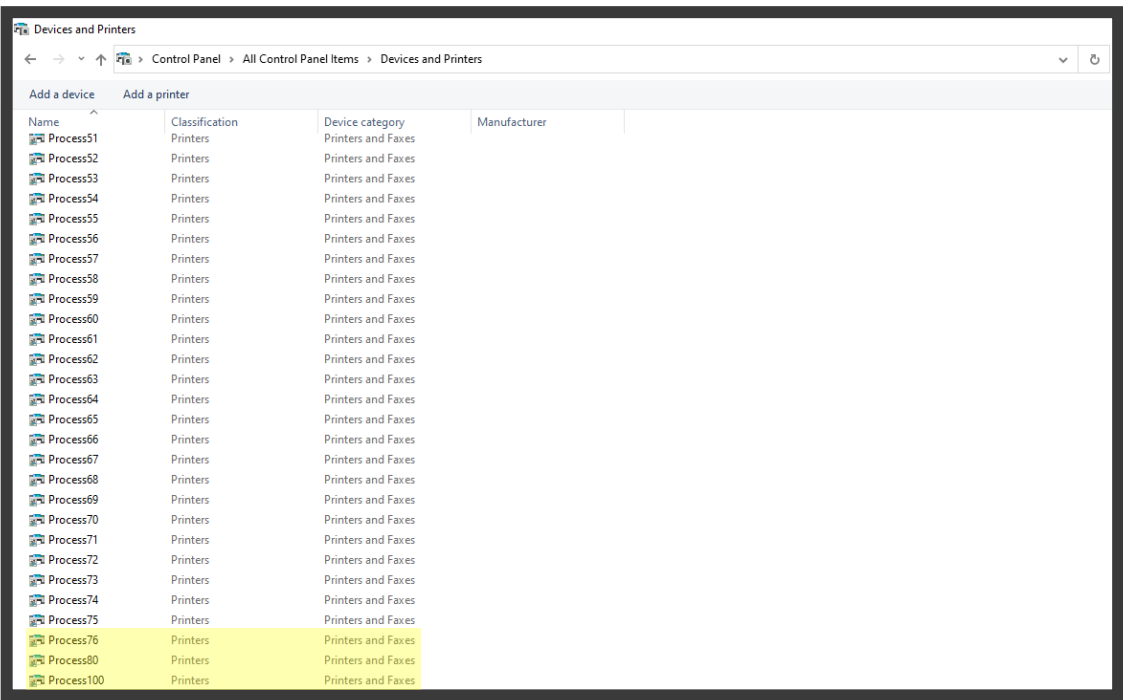
Allocation of the OS memory size, which is referred to as the Desktop Heap, failed.

This problem can be resolved by increasing the size of the **noninteractive** desktop heap to allow more processes to be created and run concurrently.

In the example below we have deployed 100 print queue processes of which only 78 print queues were created, leaving us with 22 processes not accessible.

The list of printers below shows the number of Transform Queue Process input printers, if we review the list it shows:

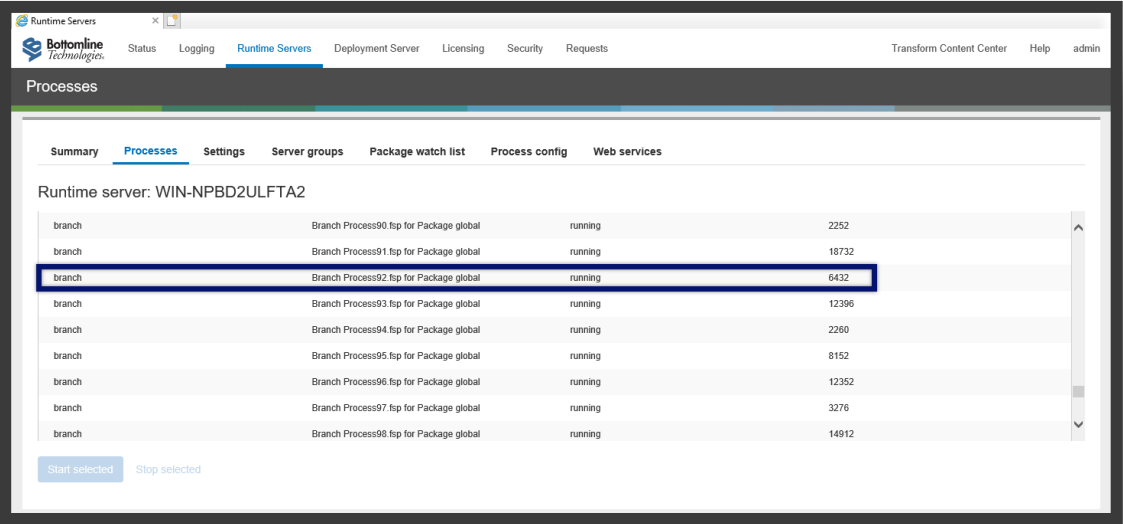
- Process 1 - 76
- Process 80
- Process 100



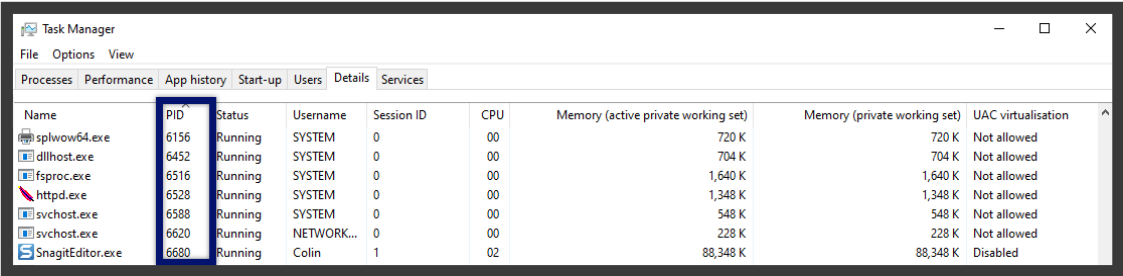
So,

What has happened to the missing queues?

If we log onto **Transform Administrator** there is no real indication that the Process is not running, when we check the **Runtime Servers > Processes** it shows the process running with a PID, in the example below `Process92.fsp` is displayed as running a processID of **6432**.



However, if we open **the Windows Task Manager** and sort the Details by PID we cannot find that processID **6432** in the details list, as the desktop heap was exhausted and could not create any more Transform processes.

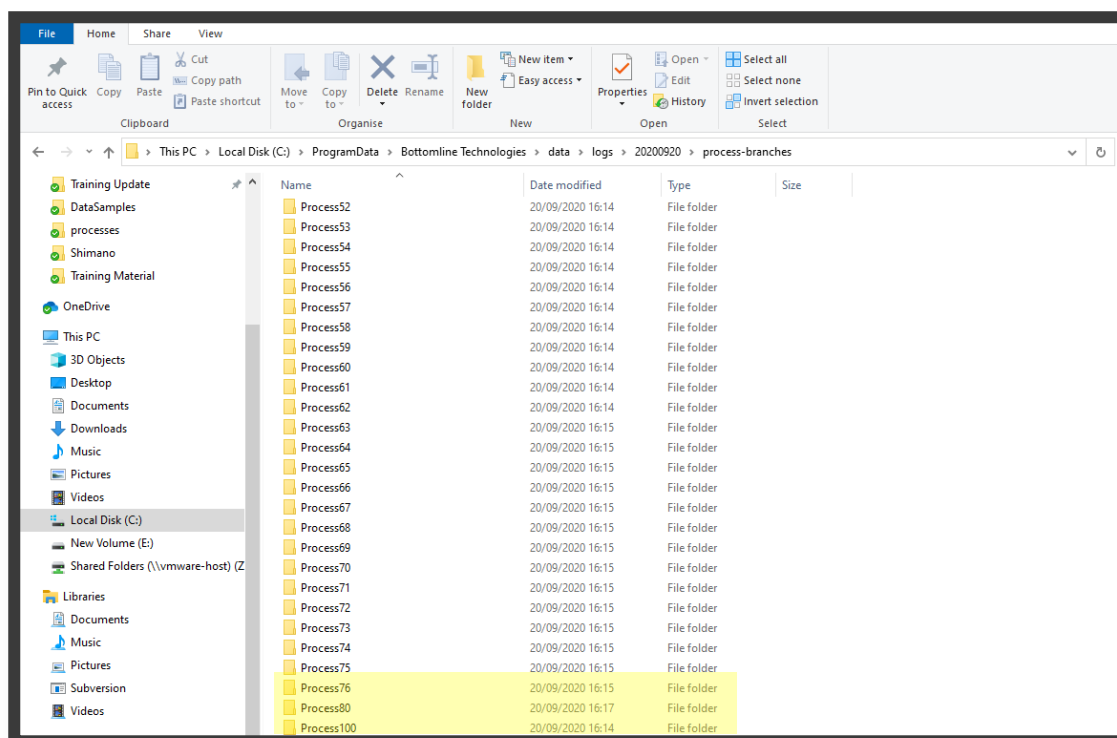


If you open **Windows File Explorer** and navigate to:

ProgramData\Bottomline Technologies\data\logs**<date>**\process-branches

You will see a list of the process-branches which have a log entry, as you can see below the Process Queues which did not start due to the desktop heap exhaustion do **NOT** have a log entry. Just as the Windows print queues you can see the directory jumps from:

- Process 76
- Process 80
- Process 100



For more detailed information about the desktop heap concept, please review on msdn.

- <https://blogs.msdn.microsoft.com/ntdebugging/2007/01/04/desktop-heap-overview/>
- <https://blogs.msdn.microsoft.com/ntdebugging/2007/07/05/desktop-heap-part-2>

BEFORE YOU START

To configure the **Windows** desktop heap you need to consider the following.

- Log in to **Windows** Server as the Administrator.
- Open the **Registry Editor**, as an Administrator.
- Back up the **Windows** Registry, before you make any changes.

IMPORTANT

If the Transform server is hosted on a Virtual machine, then it is strongly recommended that you take a snapshot backup prior to any changes to the Registry.

CONFIGURE DESKTOP HEAP

To increase the size of the noninteractive desktop heap, you need to edit the **Windows** registry by editing the **SharedSection** parameter string in the following subkey:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session  
Manager\SubSystems
```

The **SharedSection** parameter string is located in the Windows registry value and uses the following format to specify heap size:

```
SharedSection=xxxx,yyyy,zzzz
```

Where:

- **xxxx** specifies the maximum size of the system-wide heap (in kilobytes)
- **yyyy** specifies the size of each desktop heap
- **zzzz** specifies the size of the desktop heap that is associated with a noninteractive Windows instance

Procedure

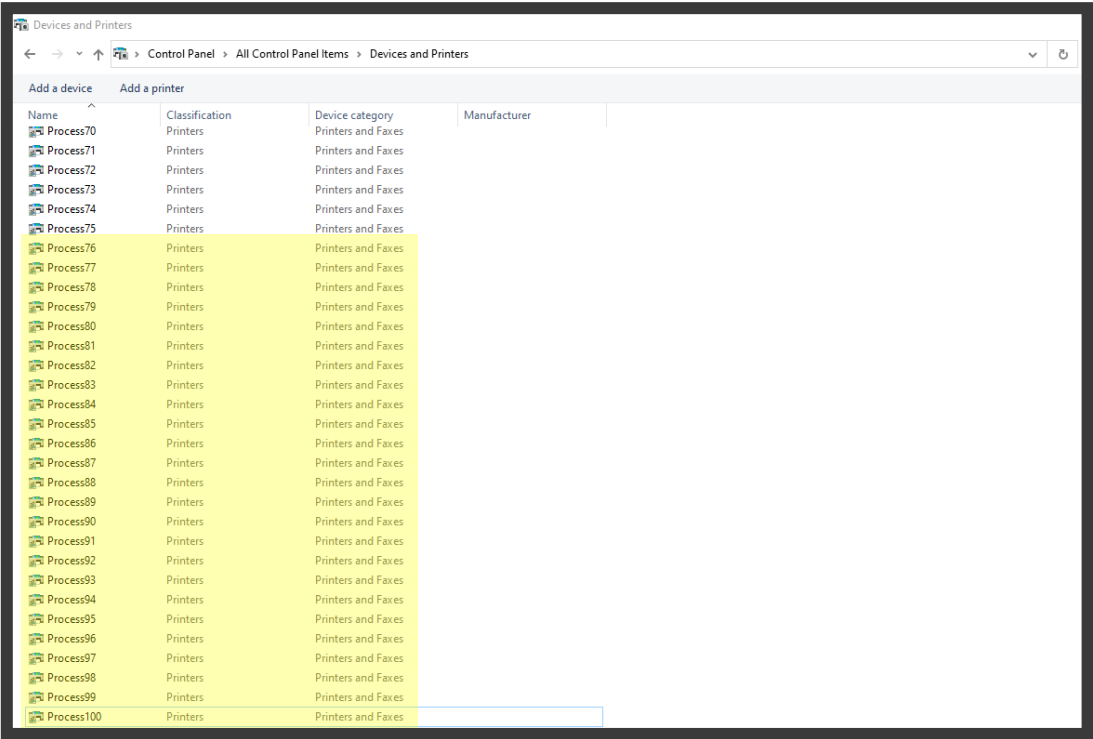
1. In the Registry Editor, select the following registry subkey:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session
Manager\SubSystems
2. In the right pane of the Registry Editor, locate the **Windows** registry value.
 - a. Right-click the **Windows** registry value and click **Modify**.
 - b. In the **Value data** field, locate the **SharedSection** parameter string, and change the last **SharedSection** parameter from 768 to 1024.
For example, specify the following values for this parameter on a 64-bit computer:
SharedSection=1024,20480,1024
*If you cannot change the size of the desktop heap to **1024**, try setting the value to **768**. For example, specify the following values for this parameter:*
SharedSection=1024,20480,768
3. Click **OK** and close the Registry Editor.

What to do next

After you make changes to the **Windows** Registry, restart **Windows** to apply your changes.

Result

After the system restart all 100 print queues have been started, with no error in the Windows Event System logs.



ADD ADDITIONAL INPUT PORTS

Each Transform Print Process Queue is assigned to an FS input port, by default there are 99 input printer ports available.

You can extend the number of ports to any whole number up to 999.

Procedure

1. In the Registry Editor, select the following registry subkey:
HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\Bottomline Technologies\Transform Foundation Server
2. In the right pane of the Registry Editor, locate the **InputPrinterPorts** registry value.
 - a. Right-click **InputPrinterPorts** registry value and click **Modify**
 - b. In the **Value data** field, change the number from 99 to a whole number up to 999.
 - c. If **InputPrinterPorts** does not exist then right-click **Transform Foundation Server** registry subkey and select add new String, name it **InputPrinterPorts**. Then perform steps a and b.
3. Click **OK** and close the Registry Editor.

What to do next

After you make changes to the **Windows** Registry, restart **Windows** to apply your changes.