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Business Express Performance

Documentation:

Usability testing on lower specification machines

Author: Philip Lacey

Version: 1-0

Date: 2014-02-10



Company Number: 400703 VAT Registered Number: IE 6420703G
Directors: Nick Wheeler, Chris Thomson, Philip Lacey



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1 Introduction

1.1 Executive Summary

Business Express is designed to work with many devices with many levels of usability. This document examines BE in operation on a Windows XP machine. The document also provides common troubleshooting techniques to deal with perceived slow performance.

1.2 Key Project Variables

Ticket Number:	2760
Status Summary:	Documentation
Primary Project Manager:	PL

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1.4 Acronyms and Abbreviations

1.4.1 All n One

API	Application Programming interface
BE	Business Express
BER8	Business Express Release 8
HTML	Hyper Text Mark-up Language
JS	JavaScript
SER1	Service Enhancement Release 1

1.4.2 Project

AVG	Anti-Virus Guard
CPU	Central Processing Unit
IE	Microsoft Internet Explorer
Gb	Gigabyte
GHz	GigaHertz
Kb	Kilobyte
Mb	Megabyte
PC	Personal Computer
RAM	Random Access Memory

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1.5 Key Stakeholders

1.5.1 All n One

<i>Initial</i>	<i>Name</i>	<i>Company</i>	<i>Role</i>	<i>Email Address</i>
NW	Nick Wheeler	All n One Ltd	CEO	nick.wheeler@allnone.ie
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PL	Philip Lacey	All n One Ltd	IT Director	philip.lacey@allnone.ie
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LA	Louise Ashton	All n One Ltd	Quality Assurance Officer	louise.ashton@allnone.ie



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1.6 Version History

Version	1-0
Date	2014-02-10
Author	Philip Lacey
Modifications	Initial draft

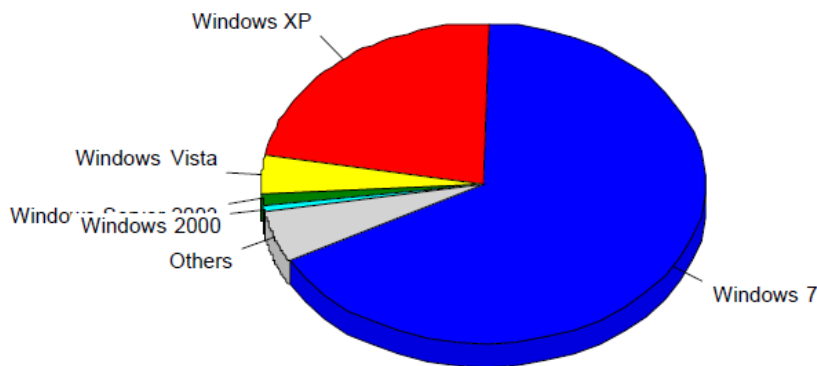
2 Consideration for operating system and browser type

Windows 2000	becomes end of life on July 13 th , 2010
Windows XP	becomes end of life on April 8 th , 2014
Windows Vista	becomes end of life on April 11 th , 2017
Windows 7	becomes end of life on January 14 th 2020
Windows 8	becomes end of life on January 10 th , 2023

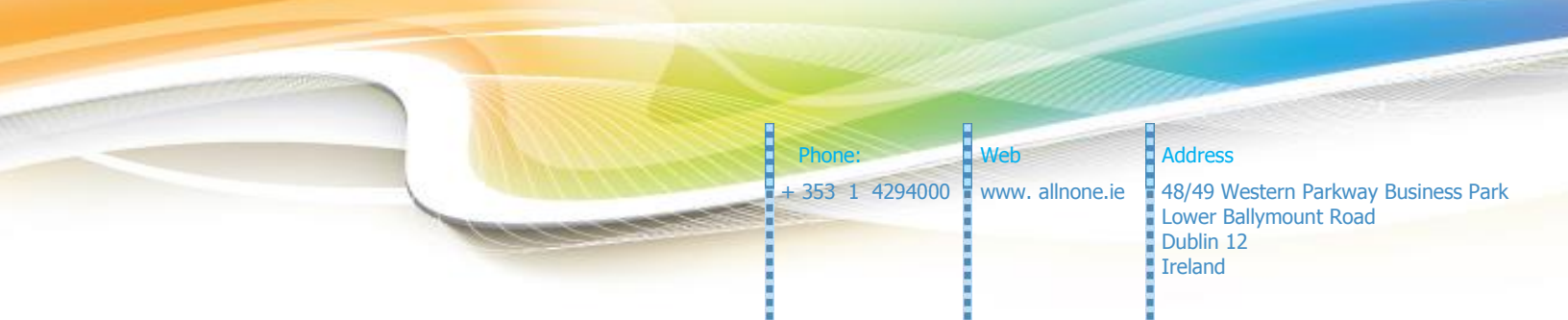
<http://windows.microsoft.com/en-ie/windows/lifecycle>

<http://www.microsoft.com/en-us/windows/enterprise/endofsupport.aspx>

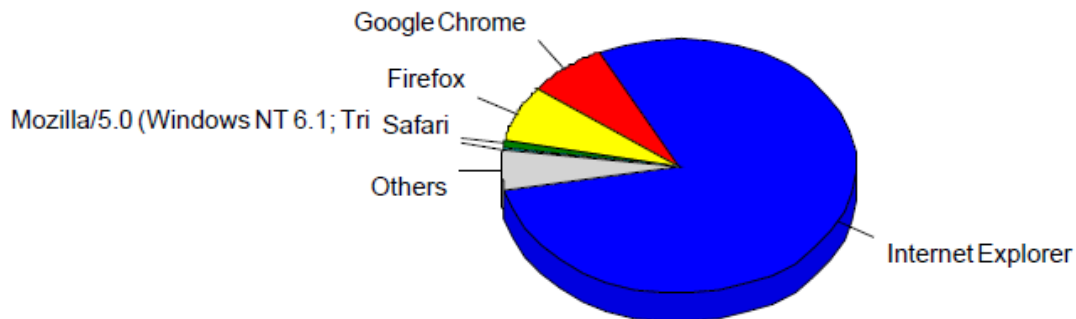
Windows XP is still heavily used, constituting 23% of all BE users in 2003.



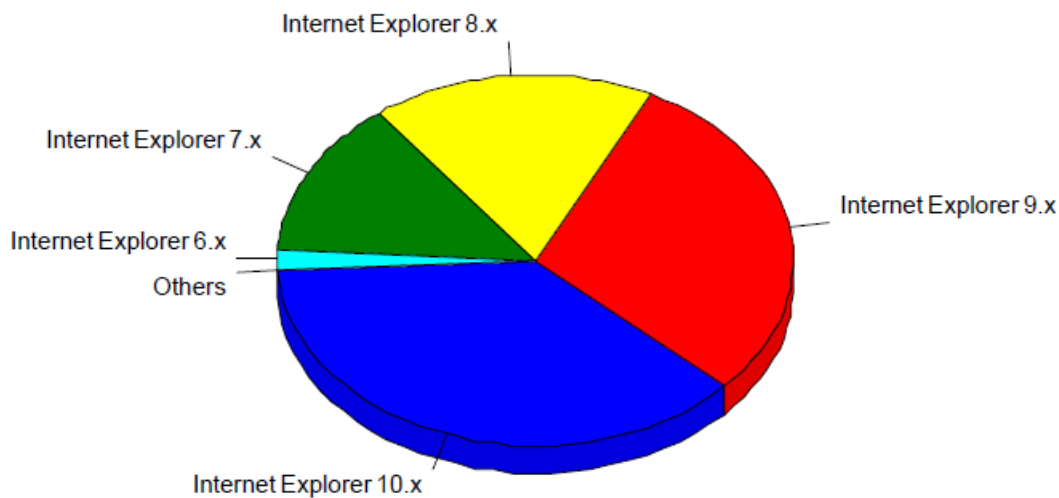
BE is developed and tested to operate with Windows XP and Windows 2000 specifically in mind and incorporating their limitations. Windows 2000 supports up to Internet Explorer 6 and Windows XP supports up to Internet Explorer 8.



In 2013, Internet Explorer was the most common browser used with Business Express at 79% of all users, using IE.



Within IE, IE6, 7 and 8 constitute 33.24% of all of our users, so developing for Windows XP and Windows 2000 is a serious consideration.



Whilst the operating system has no bearing on BE, the maximum version of Internet Explorer support is. Windows 2000 only supports up to IE6 and Windows XP only supports up to IE8. Vista goes up to IE9. Windows 7 and 8 go up to IE 11, so far.

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3 Worked example on Windows XP with IE 8

3.1 System Specification

For testing BE is tested on an HP Compaq D510 Slimline

<http://h20565.www2.hp.com/portal/site/hpsc/public/psi/home?sp4ts.oid=96302&ac.admitted=1392037977247.876444892.492883150>

The testing is done on a dedicated machine for real world experience, as opposed to emulators which may not provide comparable hardware specifications.

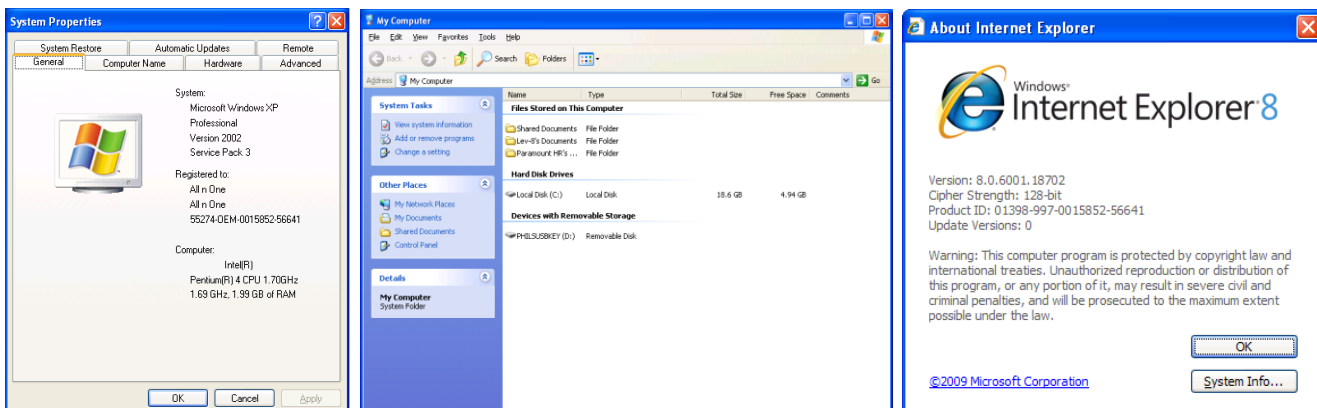
Processor: Single Core P4 1.7GHz

RAM: 2 Gb

Hard drive: 20 Gb

Operating System: Microsoft Windows XP Service Pack 3 (with all available updates)

Browser: Internet Explorer 8



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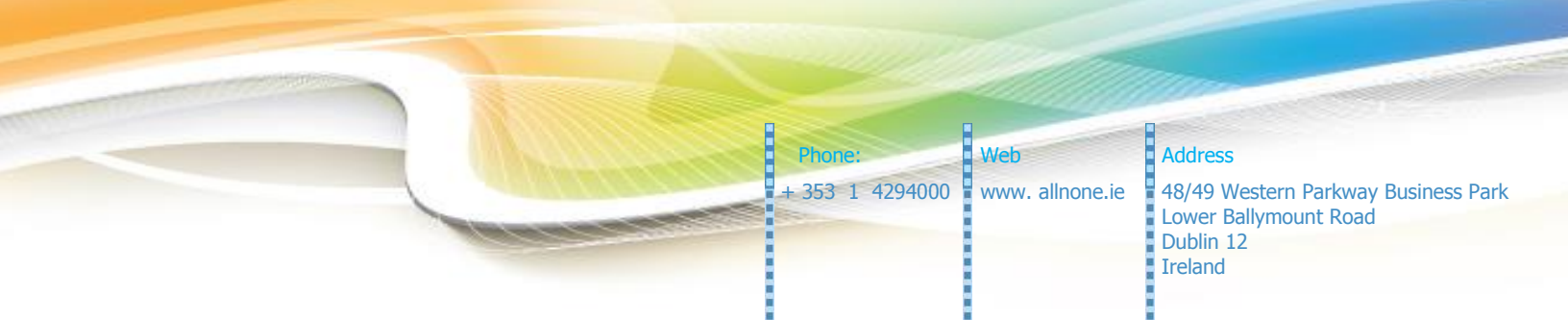
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3.2 Memory footprint

To boot to a working desktop uses 360 Mb of memory. This includes AVG 2103 antivirus to represent some antivirus software on the machine, which is common good practice.

Image Name	User Name	CPU	Mem Usage
avgcsrvc.exe	SYSTEM	00	93,820 K
svchost.exe	SYSTEM	00	31,432 K
explorer.exe	Paramount HR	00	21,904 K
avgwdsvc.exe	SYSTEM	00	16,132 K
avgui.exe	Paramount HR	00	13,644 K
avgrsx.exe	SYSTEM	00	9,632 K
avgidsagent.exe	SYSTEM	00	9,624 K
avgnsx.exe	SYSTEM	00	9,008 K
avgemcx.exe	SYSTEM	00	6,576 K
svchost.exe	SYSTEM	00	5,184 K
spoolsv.exe	SYSTEM	00	5,028 K
c2c_service.exe	SYSTEM	00	4,772 K
taskmgr.exe	Paramount HR	00	4,668 K
csrss.exe	SYSTEM	00	4,656 K
svchost.exe	SYSTEM	00	4,496 K
svchost.exe	NETWORK SERVICE	00	4,484 K
hkcmd.exe	Paramount HR	00	3,968 K
svchost.exe	LOCAL SERVICE	00	3,936 K
svchost.exe	LOCAL SERVICE	00	3,840 K
ctfmon.exe	Paramount HR	00	3,828 K
alg.exe	LOCAL SERVICE	00	3,656 K
svchost.exe	NETWORK SERVICE	00	3,604 K
services.exe	SYSTEM	00	3,492 K
mDNSResponder....	SYSTEM	00	3,000 K
DrvLsnr.exe	Paramount HR	00	2,480 K
rndlresolversvc.exe	SYSTEM	00	2,368 K
lsass.exe	SYSTEM	00	2,232 K
SMAgent.exe	SYSTEM	00	1,804 K
jqs.exe	SYSTEM	00	1,404 K
winlogon.exe	SYSTEM	00	492 K
smss.exe	SYSTEM	00	416 K
System	SYSTEM	00	384 K
System Idle Process	SYSTEM	99	16 K

Processes: 33 | CPU Usage: 0% | Commit Charge: 360M / 1889M



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When we open a demo BE system, IE loads and uses circa 40 Mb of memory per tab.

Image Name	User Name	CPU	Mem Usage
avgcsrvc.exe	SYSTEM	00	94,044 K
iexplore.exe	Paramount HR	00	40,232 K
svchost.exe	SYSTEM	00	31,432 K
explorer.exe	Paramount HR	00	21,900 K
avgwdsvc.exe	SYSTEM	00	16,132 K
avgui.exe	Paramount HR	00	13,648 K
avgidsagent.exe	SYSTEM	00	9,636 K
avgrsx.exe	SYSTEM	08	9,636 K
avgnsx.exe	SYSTEM	00	9,008 K
avgemcx.exe	SYSTEM	00	6,576 K
svchost.exe	SYSTEM	00	5,184 K
spoolsv.exe	SYSTEM	00	5,028 K
c2c_service.exe	SYSTEM	00	4,772 K
taskmgr.exe	Paramount HR	02	4,760 K
csrss.exe	SYSTEM	00	4,724 K
svchost.exe	SYSTEM	00	4,500 K
svchost.exe	NETWORK SERVICE	00	4,484 K
hkcmd.exe	Paramount HR	00	3,968 K
svchost.exe	LOCAL SERVICE	00	3,936 K
ctfmon.exe	Paramount HR	00	3,872 K
svchost.exe	LOCAL SERVICE	00	3,848 K
alg.exe	LOCAL SERVICE	00	3,656 K
svchost.exe	NETWORK SERVICE	00	3,604 K
services.exe	SYSTEM	00	3,492 K
mDNSResponder....	SYSTEM	00	3,000 K
lsass.exe	SYSTEM	00	2,772 K
DrvLsnr.exe	Paramount HR	00	2,480 K
rndiresolversvc.exe	SYSTEM	00	2,368 K
SMAgent.exe	SYSTEM	00	1,804 K
jqs.exe	SYSTEM	00	1,424 K
iexplore.exe	Paramount HR	00	1,252 K
winlogon.exe	SYSTEM	00	496 K
smss.exe	SYSTEM	00	416 K
System	SYSTEM	00	384 K
System Idle Process	SYSTEM	91	16 K

N.B. The background image is included to be representative of a normal system. It is possible to remove the background on a per user basis but this is a BE Client decision.



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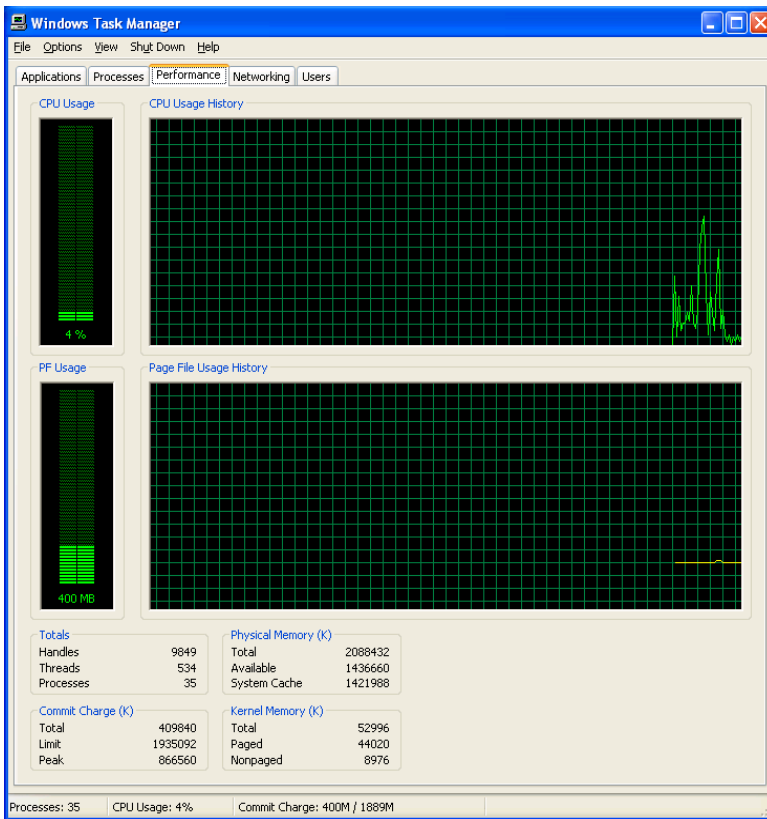
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3.3 Processor usage

As BE is pure HTML to draw pages, is a once off processor cost to render the page. The processor will spike when drawing the page and then return to low levels as no browser processing is required.



In some instances JavaScript is used in the web pages to draw features or to perform custom client side processing. JavaScript requires separate processing. JavaScript will push a core to it's maximum limit to process the code as quickly as possible. The processing will return to 0% when complete. As part of the development of BE, a close watch is kept on loops and other programming techniques in JavaScript that might cause excessive processor usage.

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4 Troubleshooting

4.1 Overview

There are many potential things that can make BE appear slow. The following suggestions are items to consider if experiencing a slow response from BE.

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4.2 Internet connection speed

BE is connected to a 1000Mbps up / 1000Mbps down uncontended connection. This provides a very internet connection. The page size for BE is circa 250 Kb.

The background image may be considerably greater in size if used, circa 1 Mb. Once the background image has loaded once, it is cached and should not have to be downloaded again. As per 3.2, the background image can be turned off on a user by user basis.

You need a 1Mbps down connection to use BE effectively though the connection will work on dial up but may not be ideal. To test your currently available speed (and yes it can vary), you need to test it. The following is an example of an Eircom 8Mb down / 1Mb up connection in the middle of a working day. The connection is only 4.91 / 0.57. This test is found at <http://www.speedtest.net> If the down speed is less than 1 Mbps then you may need to contact your Internet Service Provider for a better service.



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4.3 Processor usage

It is possible that other programs running on the computer may be slowing down the computer, so checking processor usage is next.

Press Ctrl, Alt and Del on the keyboard and choose Task Manager.

Examine the "Processes" tab

Image Name	User Name	CPU	Mem Usage
avgsrvxx.exe	SYSTEM	00	94,044 K
iexplore.exe	Paramount HR	00	40,232 K
svchost.exe	SYSTEM	00	31,432 K
explorer.exe	Paramount HR	00	21,900 K
avgwdsvc.exe	SYSTEM	00	16,132 K
avgui.exe	Paramount HR	00	13,648 K
avgidsagent.exe	SYSTEM	00	9,636 K
avgrsv.exe	SYSTEM	08	9,636 K
avgnsv.exe	SYSTEM	00	9,008 K
avgemcx.exe	SYSTEM	00	6,576 K
svchost.exe	SYSTEM	00	5,184 K
spoolsv.exe	SYSTEM	00	5,028 K
c2c_service.exe	SYSTEM	00	4,772 K
taskmgr.exe	Paramount HR	02	4,760 K
csrss.exe	SYSTEM	00	4,724 K
svchost.exe	SYSTEM	00	4,500 K
svchost.exe	NETWORK SERVICE	00	4,484 K
hkcmd.exe	Paramount HR	00	3,968 K
svchost.exe	LOCAL SERVICE	00	3,936 K
ctfmon.exe	Paramount HR	00	3,872 K
svchost.exe	LOCAL SERVICE	00	3,848 K
alg.exe	LOCAL SERVICE	00	3,656 K
svchost.exe	NETWORK SERVICE	00	3,604 K
services.exe	SYSTEM	00	3,492 K
mDNSResponder....	SYSTEM	00	3,000 K
lsass.exe	SYSTEM	00	2,772 K
Drvlstr.exe	Paramount HR	00	2,480 K
rndiresolversvc.exe	SYSTEM	00	2,368 K
SMAgent.exe	SYSTEM	00	1,804 K
jqs.exe	SYSTEM	00	1,424 K
iexplore.exe	Paramount HR	00	1,252 K
winslogon.exe	SYSTEM	00	496 K
smss.exe	SYSTEM	00	416 K
System	SYSTEM	00	384 K
System Idle Process	SYSTEM	91	16 K

Sort the information by the processor usage (CPU). A computer in idle should only be using from 0% up to 10% sporadically. Any program consistently running (>20 seconds) at any % level should be examined. No process should be continually using CPU. Real time communications tools like Skype will show up frequently but not consistent usage.

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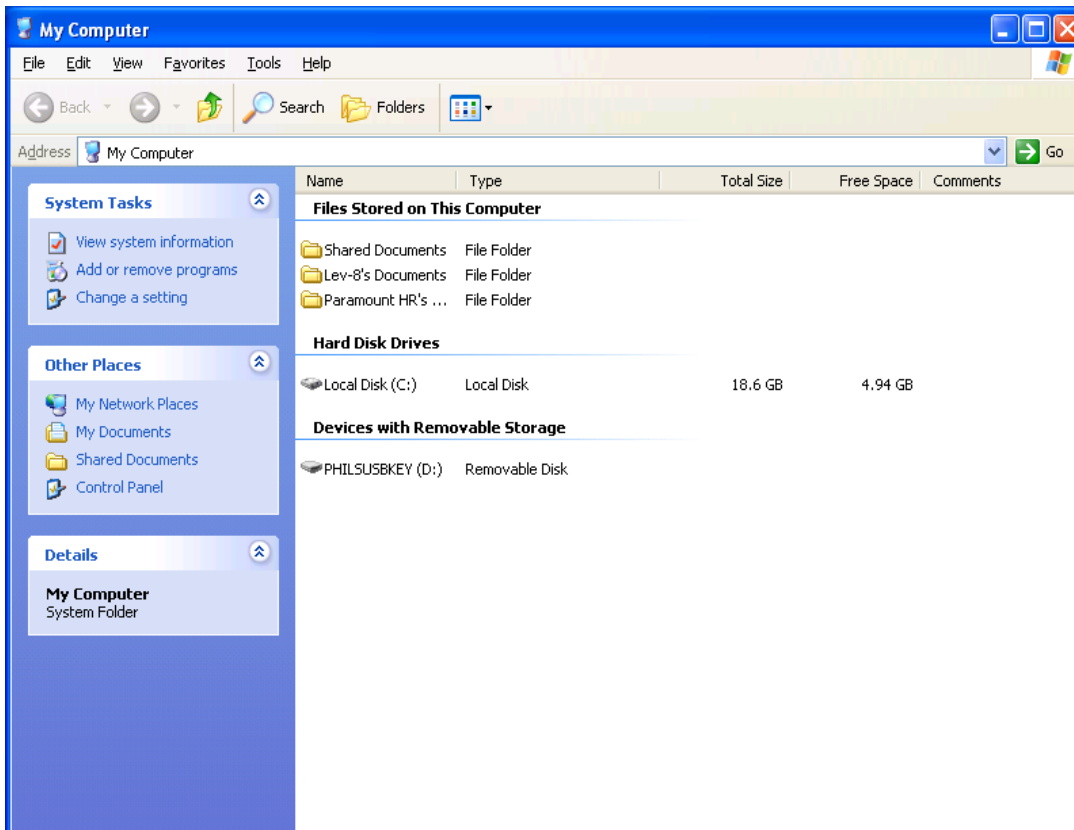
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4.4 Hard drive space

A computer running out of hard drive space, will get progressively worse. If more than 75% of your hard drive is used, your computer will likely experience extensive slow down. Double click my computer.



If the view above does not appear, Right Click in the white space and choose View > Details. Find the space left beside each drive, but focus on the C: drive. If you need more space, you need to either clean the drive to make more space or purchase a new drive and transfer your existing data. There are numerous options for cleaning drives.

CCleaner from Piriform is excellent for this process and it is free.

<http://www.piriform.com/ccleaner>

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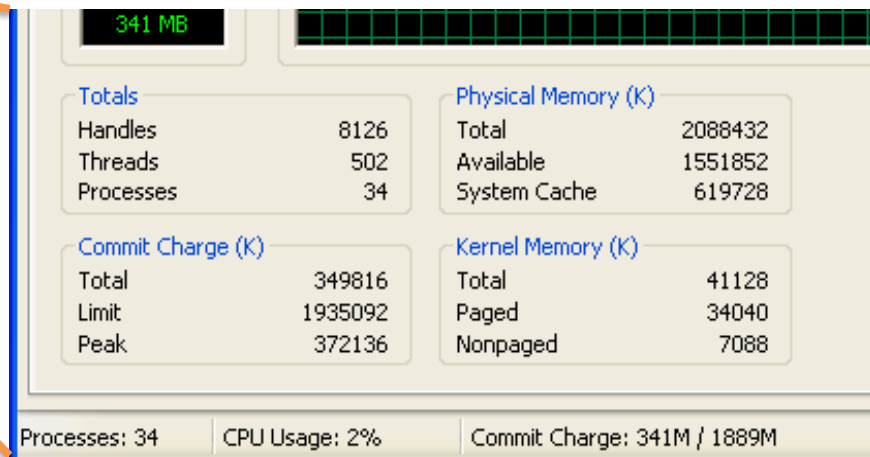
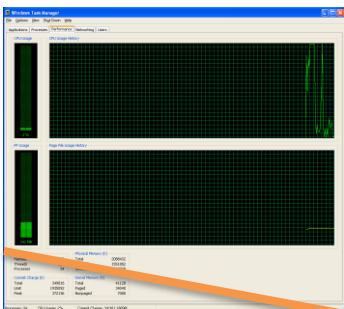
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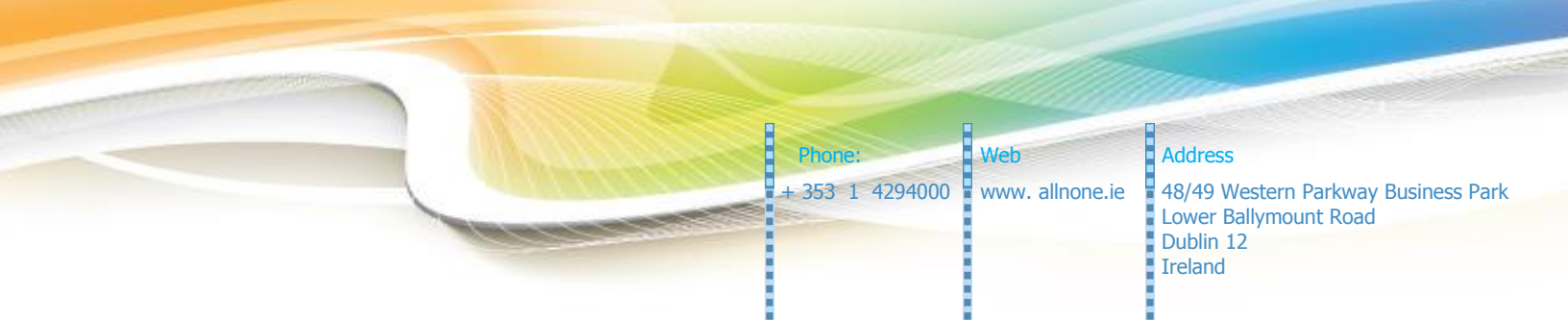
4.5 Page File

When RAM is full it is possible for the computer to temporarily transfer the contents of some of your RAM into a big file on the hard drive called pagefile.sys. This allows you to have virtually unlimited RAM. The trade-off is that transfer to and from the hard drive is very very slow.

If you get your machine to a common RAM footprint state, i.e. open all your normal programs as you would use your computer normally. Press Ctrl, Alt and Del on the keyboard and choose Task Manager. Open the performance tab.

In the bottom left corner of the screen. If the Commit Charge (K) – Total number is greater than the Physical Memory (K) – Total number, then you have not got enough RAM in your machine for all processes. With the price of RAM it is simple often to upgrade the RAM of the machine. In this example we are using 349,816Kb (i.e. 350 Mb). We have available 2,088,432Kb (i.e. 2000 Mb). In this case we do not need a pagefile.





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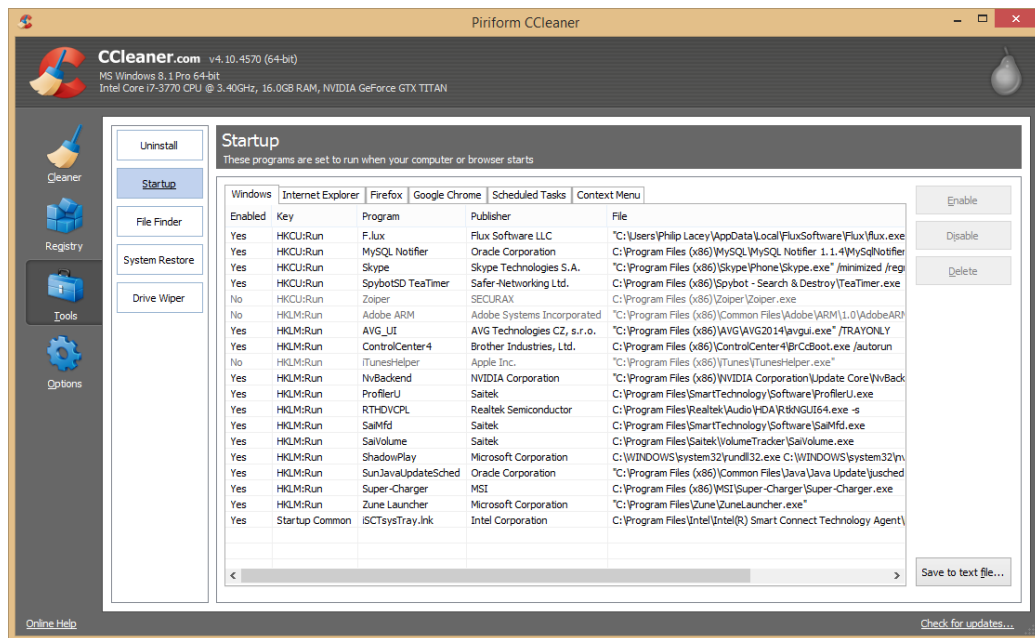
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If there is enough RAM already in the machine for your needs it is possible to completely disable the pagefile. This will result in significant speed savings and should be instantly noticeable during startup. It is important to note that without a pagefile, if you run out of RAM, the program experiencing the refusal will stop or potentially crash.

It is always advisable to remove non-essential software from RAM. The "Processes" tab lists all the programs currently running and their RAM usage. Some experience is required to identify non-essential processes but the titles of each should give you an idea of what the program does.

In CCleaner mentioned in 4.4, it is possible to easily disable add ons and items at startup that may not be necessary.



Disabling the pagefile is an advanced procedure and does require some IT experience. If you have checked that you have physical capacity, then the instructions can be tried here.

<http://www.howtogeek.com/79892/xp-tweak-disable-page-file/>



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4.6 Browser Add Ons

Your browser can be extended by third party tools. You may never use these tools but they can take up valuable processor and RAM resources. It is possible to disable these add ons

Here is a guide relevant to your browser, written by Microsoft

<http://windows.microsoft.com/en-IE/internet-explorer/manage-add-ons>

4.7 Spyware

If websites of low moral fibre are visited or spoof emails received and clicked it is very easy to accidentally install spyware, which can destroy your Internet browser.

An excellent program for cleaning these is SpyBot Search and Destroy. The current version, version 2, is not as good as the older version 1.6.2. The download for this is available from:

<http://www.safer-networking.org/mirrors16/>

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4.8 Maintenance

All PCs should be maintained semi-regularly. For PCs in the All n One office, the scheduled is

Weekly:

- Hard drive defragment (automatic with Windows 7 and above)
- File removal to centralised storage for backup and machine security

Monthly:

- AVG Update and Full AVG Scan,
- Spybot Update and Scan
- Spybot Blacklist update
- CCleaner update with file and registry sweep.
- Through CCleaner, review of start-up and browser add ins.