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Bluetooth 3.0 Gets Speed Boost to 24Mb/s.

Bluetooth 3.0 Enables High-Speed Close-Proximity Transfer

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by Anton Shilov

Bluetooth has always been very useful, but rather slow close-proximity transfer technology. With the finalization of the Bluetooth version 3.0 it will take much less time to transfer music files, pictures and videos between various devices. Nevertheless, Bluetooth is still not a replacement for high-speed wired connection technologies.

Bluetooth 3.0 gets its speed from the 802.11 radio protocol, which is primarily known for powering Wi-Fi networks. The inclusion of the 802.11 Protocol Adaptation Layer (PAL) provides increased throughput of data transfers at the approximate rate of 24Mb/s. In addition, mobile devices including Bluetooth 3.0 will realize increased power savings due to enhanced power control built in.

“Utilizing the 802.11 radio was a natural choice as it provides efficiencies for both our members and consumers – members get more function out of the two radios they are already including in devices, and consumers with Bluetooth 3.0 HS products will get faster exchange of information without changing how they connect. We are excited to expand the possibilities of the PAN,” said Michael Foley, Ph.D., executive director of the Bluetooth SIG.

This newest version of Bluetooth technology builds on the inherent qualities of the current 2.1 EDR version, including Simple Secure Pairing and built-in, automatic security. Bluetooth 3.0 HS provides backwards compatibility, enabling both the expansion and enhancement of this technology with every new specification release.

With the availability of Bluetooth version 3.0 HS, consumers can expect to move large data files of videos, music and photos between their own devices and the trusted devices of others, without the need for cables and wires.

While Bluetooth 3.0 HS will not be able to match TransferJet, which development is led by Sony Corp. and is supported by various consumer electronics companies, in terms of data transfer rate, as the latter can boast with impressive 375Mb/s, it clearly beats the competitor in terms of proximity: about ten meters versus about three centimeters.

The Bluetooth SIG's formal adoption of the specification is only the first step in the product lifecycle. News out today from wireless chip manufacturers and Bluetooth SIG member companies Atheros, Broadcom and CSR shows the second step – getting silicon solutions to device manufacturers – is already underway. End products for consumers are expected to be in the market in 9 to 12 months.

File Size Units

File sizes tend to be one of the more perplexing issues for the both the fledgling and intermediate computer user. So, we've put together a breakdown of the various file size "units" you may encounter.

File Sizes

Bit- The smallest unit in computing. It can have a value of 1 or 0. You'd be hard pressed to find a file size listed in bits.

Byte - A (still small) unit of information made up of 8 bits.

Kilobyte(KB) - A unit of approximately 1000 bytes (1024 to be exact). Most download sites use kilobytes when they give file sizes.

Megabyte (MB) - A unit of approximately one million bytes (1,024 KB).

Gigabyte (GB) - Approximately 1 billion bytes (1024 MB). Most hard drive sizes are listed in gigabytes.

Application

OK, now for a little practical application.

- A 3 1/2" floppy drive holds 1.44 Megabytes (1,474 KB).

- A CD Rom holds 650 Megabytes (though most programs you get don't utilize the whole 650). This would be around 450 of those 3.5 floppies.

- A 20 Gig hard drive will hold the same amount of info as 31 CD ROMs or 14,222 of the 3.5 floppy disks.

- It takes between 7-10 minutes to download a one megabyte (1024 KB) file using the average dial up interent connection.

- A typical page of text is around 4KB.

To see the size of a given file, just right-click it (in Explorer or My Computer) and select Properties from the resulting menu.

I know that even with the information above, it can still be confusing, so I thought I would compare these digital units of measure to some everyday objects. Just picture them being completely hollow so you can store information in them.

Bit - Let's call this a regular sized marble.
Byte - Compared to the marble, this would be a baseball.
Kilobyte - Now we jump up to a pickup truck size.
Megabyte - Now for the leap - this would be a medium sized sky scraper.
Gigabyte - Take 1024 of the medium sized sky scrapers and stick them together for this one!

How much electricity does a Computer consume?

Here are some data for computers and components that I have measured. These were measured with a Conrad "Volt craft Energy Check 3000" on the AC input of the device; according to c't this measurement device is relatively accurate above 7W or so.

Complete setups

190W
: K6-2 300MHz system idle (see below), 21" Nokia 445Xi monitor displaying much white, active speakers, cable modem, HP DeskJet 600 (soft-off).

244W
: Athlon 64 system idle (see below), 21" Nokia 445Xi monitor displaying much white, aktive speakers, cable modem (HP LaserJet 1200 hard-off).

25W
: The Athlon 64 system above, with main box soft-off, monitor soft-off, speakers hard-off, printer hard-off, cable modem on (no power switch).

12.7W
: iBook G4 1066MHz idle, screen off, running Linux-2.6.8; 12.1W with disk on standby (spun down) in laptop-mode; 18W idle with screen on, brightest setting; 14.9W idle with screen on, darkest setting before total off; 22W loaded (kernel compile), screen off.

Boxes

360-550W

Core 2 Quad Q6600 (2.4GHz), Asus Striker Extreme motherboard (Nvidia 680i chipset), 2 EVGA Nvidia 8800 Ultra Superclocked graphics cards (for SLI operation), 3 hard disks, 650W power supply, running Windows Vista 64. 360-380W idle, 470-550W when loaded with Crysis (a game benchmark).

283W-423W

Dual Xeon 5160 (Socket 771, 3GHz, dual core, 4MB L2 cache, 65nm), Supermicro X7DBE+ board with on-board graphics (ATI ES1000), 24GB DDR2-667 RAM (12*2GB FB-DIMMs), 2 400GB SATA hard disks spinning, 1 DVD-RW drive, Tagan 700W power supply, lots of fans, running Linux 2.6.17.

clock	idle	load 1	load 2	load 3	load 4
2000MHz	283W	290W	297W	305W	311W
2333MHz	284W	296W	309W	317W	326W
2666MHz	285W	305W	324W	335W	347W
3000MHz	286W	313W	340W	354W	368W

With other programs producing the load we could get up to 412W with pure CPU load, 419W with CPU and memory load, and 423W by also accessing the hard disks.

283W-451W

The Dual Xeon box above, upgraded with two Xeon 5450s (Socket 771, 3GHz, quad core, 2*6MB L2 cache per socket, 45nm).

load	0	1	2	3	4	5	6	7
2000MHz	283W	292W	302W	311W	321W	329W	336W	344W
3000MHz	291W	310W	328W	345W	362W	377W	396W	413W

The load was produced using `yes >/dev/null` (IIRC that load produced 412W at load 4 3000MHz before the CPU upgrade). By replacing one `yes` process with a process that copies 1GB of memory repeatedly, the power consumption at load 8 3000MHz went up to 451W. Replacing more `yes` processes with memory-intensive ones reduces power consumption.

292W-351W

HP Workstation with 2 900MHz Itanium2 CPUs, 4GB RAM, 2 SCSI hard disks with 10000rpm and some other goodies.

```
   load  0    1    2
 900MHz 292W 321W 351W
```

The load was produced using `yes >/dev/null`

180W-225W

Dual Opteron 246 (Socket 940, 2GHz, 1MB L2 cache), some Tyan Thunder K8 board with on-board graphics, 2GB PC2700 RAM with ECC, 2 IDE hard disks, 1 DVD-ROM drive. 180W idle, 225W with both CPUs under load.

186W

Compaq XP1000 (500MHz Alpha 21264 CPU, 128MB RAM, 1 SCSI disk, 1 CD-ROM drive, Matrox Millenium II PCI graphics card).

121W-212W

Dual Opteron 270 (Socket 940, Dual-core 2GHz, 2*1MB L2 cache), Tyan S2892 Thunder K8SE board with on-board graphics (ATI Rage XL), 8GB PC3200 ECC RAM, 2 300GB SATA hard disks spinning, 1 DVD-RW drive, Tagan TG-480-U22 power supply, running Linux-2.6.14.3.

```
clock   voltage  idle  load 1  load 2  load 3
1000MHz 1100mV   121W   124W    127W    131W
1800MHz 1350mV   161W   171W    181W    191W
2000MHz 1350mV   167W   178W    190W    200W
   ondemand      121W   154W  165W/189W
```

Linux-2.6.14.3 seems to prefer to put the second process on the second chip, so we usually got the 189W consumption with two non-nice processes and the ondemand frequency governor; we got the 165W number by starting three processes, then killing the middle one, so that both processes run on the same chip, and the other chip idles.

97W-185W

Core 2 Duo E8400 (45nm, 3GHz, 6MB L2), MSI P35 Neo2-FR (Intel P35+ICH9R chipset), PowerColor Radeon X850XT card with 256MB RAM, 4GB DDR2-800 RAM, Creative Audigy soundcard, NE2000PCI clone Ethernet card, 2 spinning 750GB SATA hard disks (WDC WD7500AACS-00ZJB0, SAMSUNG HD753LJ), 1 DVD-RW

drive, 1 floppy drive, Enermax-EG365AX-VE(G) ATX12V power supply, Linux. Idle 97W-100W. Pure CPU loads (`yes >/dev/null`):

```
clock    idle   load 1  load 2
2000MHz  100W   111W    121W
2333MHz  101W   115W    127W
2666MHz  102W   118W    133W
3000MHz  103W   123W    140W
```

179W when running `glxgears` in addition to two instances of `nice yes >/dev/null` at 3000MHz. 150W-155W when running UT2004 without active background jobs. 185W peak when running Titanquest on Windows XP.

Variations on graphics cards:

```
Connect3D ASUS      Sapphire   Gainward
Radeon    Nvidia    Radeon     Radeon
X850XT    EN8600GT  X1650Pro   4650
          silent
98W       110W       94W       95W      Linux
idle (free drivers: radeon, nv)
98W       103W       94W       83W      Windows
idle
185W      152W      150W      121W      Windows
TitanQuest peak
```

The middle two cards are fanless.

103W-156W

Xeon 3070 (=Core2 Duo E6700, Socket 775, 2.66GHz, 4MB L2), Supermicro PDSME+ (Intel E7230 chipset), 8GB DDR2 RAM, 2 320GB SATA hard disks, 1 DVD-ROM, 1 floppy drive, Supermicro case with Ablecom SP645-PS 645W power supply. With "yes >/dev/null" loads (and idle drives), I see:

```
clock   idle   load 1  load 2
1600MHz 103W    112W    122W
2133MHz 104W    120W    136W
2666MHz 104W    133W    156W
```

With the load "gforth -e ": foo begin again ; foo" used in most other results here, I see:

```
clock   idle   load 1  load 2
```

```
2666MHz 104W    123W    132W
```

The difference between the loads was not as big on other machines where I tested both.

94W-160W

Core 2 Duo E6600 (Socket 775, 2.4GHz, 4MB L2 cache), ASUS P5LD2 SE board (i945P), 2 GB DDR2 RAM, Palit Radeon X800GTO with 256MB RAM, Realtek 8169 ethernet card, 1 250GB SATA hard disk, 1 DVD-ROM drive, 1 DVD-RW drive, DTK 400W power supply. 94W idle under Linux, 160W gaming under Windows. With a Radeon X550 (instead of the X800GTO) under Linux, we see the following with a pure CPU load (the same used on other boxes; there are more energy-hungry loads):

```
clock   idle  load 1  load 2
1600MHz  85W    94W    100W
2400MHz  86W   105W    115W
```

Moreover, we tried a few different graphics cards on this machine, and measured the following (under Windows):

```
Card             idle   UT2004  Aquamark
Radeon X550       86W    122W
Radeon X800GTO    94W    163W
Radeon X850XT    104W    181W    190W
```

83W-180W

Athlon 64 3200+ (Socket 754, 2GHz, 1MB L2 cache, Clawhammer C0 stepping), Asus K8VSE Deluxe (VIA K8T800), Gforce4Ti4200 AGP with 64MB RAM, 512MB PC2700 RAM with ECC, Creative Audigy soundcard, NE2000PCI clone Ethernet card, 2 IDE hard disks, 1 LG CDRW drive, 1 Liteon DVD+RW drive, floppy drive, Enermax-EG365AX-VE(G) ATX12V power supply. 120W idle under Linux (without OS support for Cool&Quiet) with one disk spinning, 160W when running oggenc under Linux, 180W when playing a game under Windows.

~15W less with a Radeon 9600 (instead of the Gforce 4200). ~20W less when idle under Linux with cpufreq (Cool'n'Quiet support) @800MHz. With these changes, ~83W when idle, ~145W compiling, ~160W gaming.

83W-143W

Athlon 64 X2 4400+ (Socket 939, 2.2GHz, 2*1MB L2 cache, cpu family 15 model 35), Tyan S2865AG2NRF Tomcat K8E, on-board graphics (ATI Rage XL) in text mode, 4GB PC3200 DDR ECC SDRAM, 2 300GB hard disks spinning, 1 DVD-RW drive, Tagan TG480-U22 power supply.

		power		
clock	voltage	idle	load 1	load 2
1000MHz	1200mV	83W	93W	102W
1800MHz	1250mV	86W	103W	121W
2000MHz	1300mV	88W	109W	130W
2200MHz	1350mV	92W	116W	143W

A very similar machine, but with an Athlon 64 X2 4600+ (cpu family 15 model 43) consumes as follows:

		power		
clock	voltage	idle	load 1	load 2
1000MHz	1200mV	89W	98W	106W
1800MHz	1200mV	90W	105W	120W
2000MHz	1250mV	93W	112W	131W
2200MHz	1300mV	98W	120W	144W
2400MHz	1300mV	98W	122W	149W

BTW, load is a pure CPU load. We found significantly higher power consumption for a memory-bound load (~147W on the second system with load 1, and up to 160W with load 2; additional core-intensive work and maybe some I/O to a PCIe graphics card should increase the power some more).

65W-110W

Athlon 64 3200+ (Socket 939, 2GHz, 512KB L2, Winchester (90nm)), MSI K8T Neo2 (VIA K8T800), Radeon 9600XT AGP with 256MB RAM, 1GB PC3200 RAM (2*512MB), on-board sound and network, 1 hard disk, 1 CDRW drive, 1 DVDRW drive. ~65W idle under WXP (no Cool'n'Quiet, should be ~6W less), ~78W idle under Linux (no Cool'n'Quiet, does not work properly on this box), ~100W compiling, ~110W gaming. The main difference to the other Athlon 64 3200+ box probably the CPU (early Clawhammer vs. Winchester).

60W-100W

Pentium 4 2.26GHz, i845E based board, ATI Rage128, 1GB PC2100 RAM with ECC, 1 IDE disk, 1 CD-ROM drive. 60W idle, 100W under load.

60W

K6-2 300MHz (idle), Soyo SY-5EHM (VIA chipset), Voodoo 3 3000 AGP, 192MB PC100 RAM, Soundblaster Pro ISA sound card, NE2000 PCI ethernet card, 3 hard disks, 1 CD-ROM drive (playing an audio CD).

16W

Igel Premium 532: diskless, fanless PC with 800MHz VIA C3 CPU used as X-Terminal, with on board graphics, idle.

Monitor

88W-163W

30" Dell 3008WFP LDC Monitor; 88W at lowest brightness (still almost too bright when the monitor is new), 163W at the highest brightness (unbearably bright when the monitor is new).

70W-110W

21" Nokia 445Xi CRT monitor; 70W displaying black, 110W displaying all white at the highest brightness level.

40W-50W

21" Viewsonic VP 211b LCD monitor. Power varies with brightness level set (but not with content).

Speakers

6W-7W

Microspot CP-300 active stereo speakers. 6W silent, 7W with ordinary volume.

10W-30W

Creative Inspire P580 5.1 system. 10W silent, 30W at max. volume with some film running.

DELETE SYSTEM RESTORE FILES

Have you ever got the feeling that you are losing space in your hard disk for no apparent reason? Have you tried finding out the sum total space occupied by all the files, and found that the available free space in the drive is lesser than expected (i.e. there is a certain amount of space which is occupied, but unaccounted for?) If you have, and are wondering where and what is occupying this space, read on.

Windows Vista has a utility called **System Restore** which is enabled by default. Periodically the operating system takes a snapshot of your computer and saves it as a Restore Point. This gives you the option to restore it back to this state at some point in the future, if you choose to. However, a vast majority of us do not utilize System Restore and are unaware that the restore points are occupying precious space on our hard disks.

A good practice to follow, provided your system is running smoothly, is to delete old restore points except the most recent one, by performing Disk Cleanup on a period basis.

This helps ensure the following dual advantages:

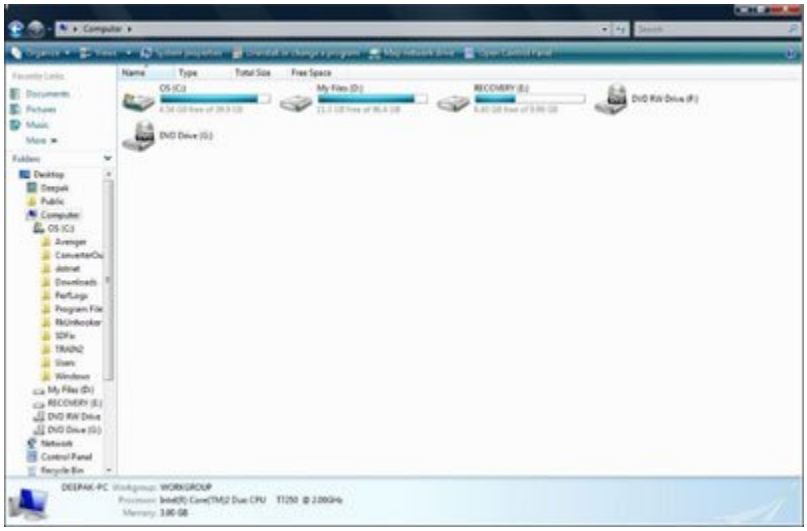
1. Unnecessary outdated save points are deleted

2. Retain the option to perform a System Restore to an earlier stable state if required.

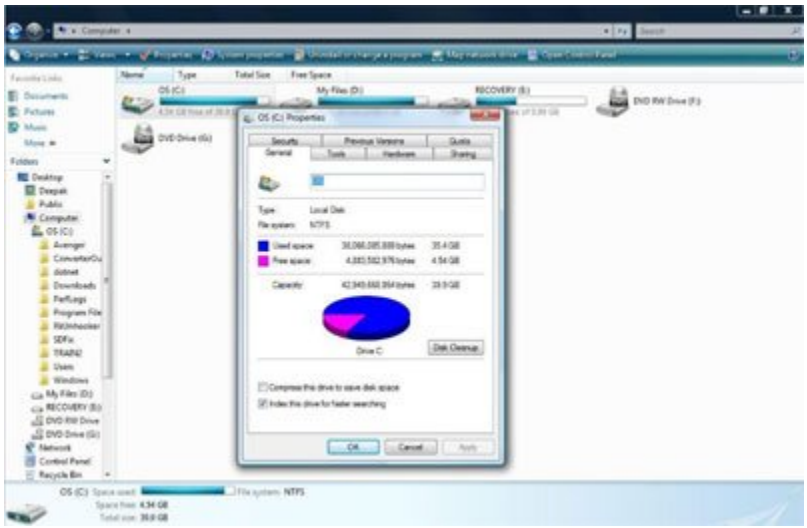
Below is a step-by-step tutorial on how to delete these old restore

points and recover some space in Windows. **Administrator access will be required in order to perform this**.

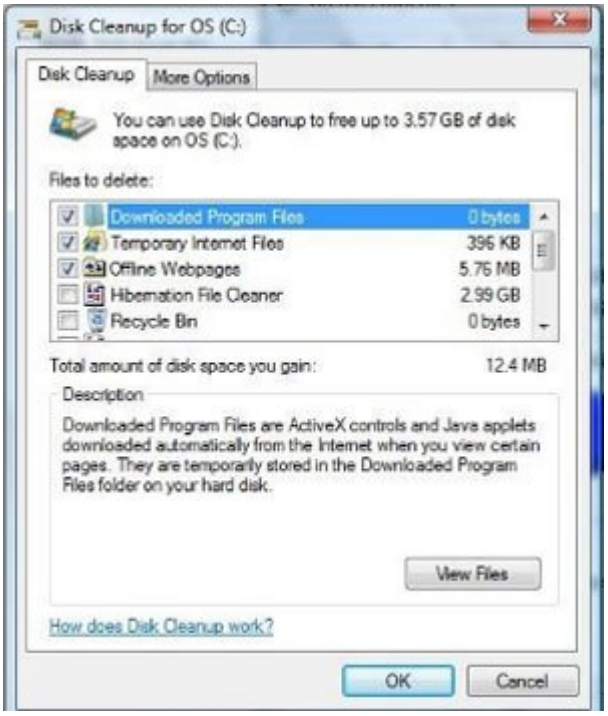
Step1: Navigate to the **My Computer** Screen as shown below



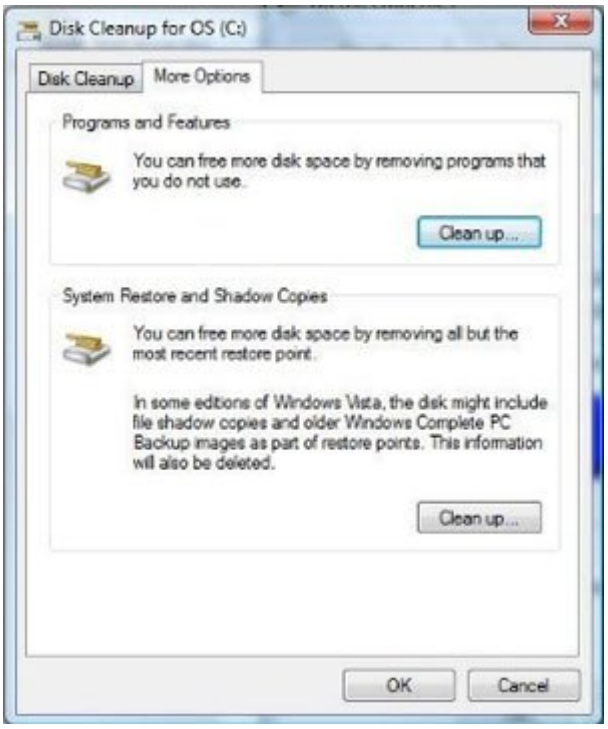
Step2: Right-Click and Open **Properties** for the “C” Drive



Step3: Click on **Disk Cleanup** and open the Disk Cleanup Window. Choose “My Files Only” or “Files from All Users on this Computer” as required. I normally use “Files from All Users on this Computer” as I clean up old files for all user accounts. Click on “**Continue**” in the Vista User Account Control Window



Step4: Navigate to the "**More Options**" tab, and click on the "Clean Up" button as indicated in the figure to delete old restore points to free up space. In the confirmation box, Click on "**Delete**"



Step5: Voila! It's done. A certain amount of free space will be recovered upon deleting old restore points.

Disk Cleanup can also be utilized to delete:
-Temporary Internet Files
-Offline Web-pages
-Files in Recycle Bin
-Hibernation File
-Thumbnails
-Windows Error Reporting Dump Files

Disk Cleanup should be performed on a regular basis in order to maximize performance.

EXPANDING CELL SELECTION THE EASY WAY IN MS EXCEL

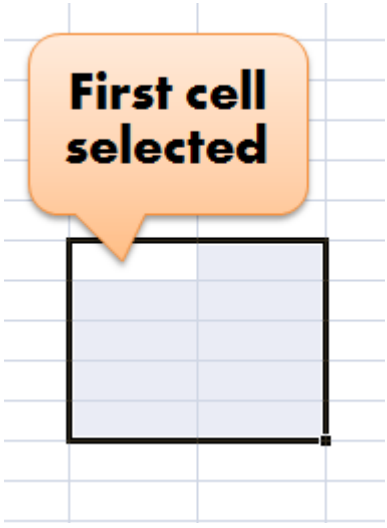
When I select a range of cells in MS Excel, whether I use the mouse or keyboard, it's not uncommon for me to discover that I've not quite got it all.

Many times that's not a big deal since I know enough to hold down the Shift key and keep expanding in the direction I was already going.

But what if you've realized that the missing cells are back where you're selection began instead of where it ended.

Have you tried to expand that?

If you use the mouse to try and expand you'll find that the selection starts to flip around the first cell you selected when you started. (It's the cell that is in the selection rectangle but not shaded.)



If you use the keyboard (with the Shift key) you'll find that you're collapsing the selection area… moving back towards the first cell selected.

So now what?

Start over?

Lots of people do but believe it or not, it's not necessary.

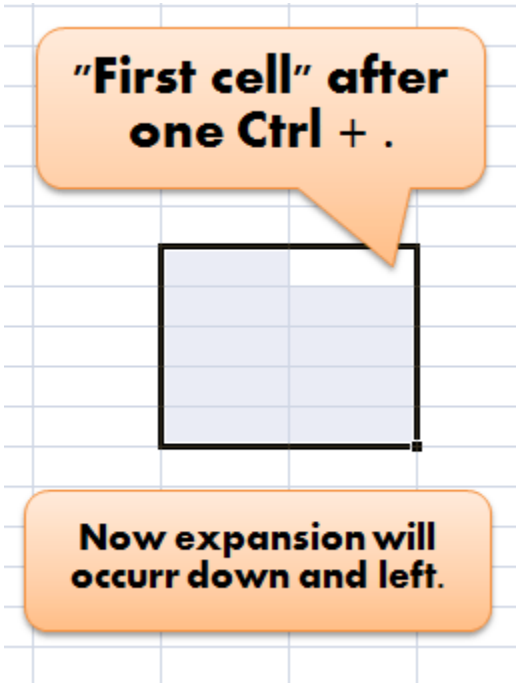
I don't know if you've noticed but cell range selection always moves away and toward the first cell selected.

So… if we could change the designated "first cell" then we should be able to change the direction that selection expansion occurs.

Simple enough, if you know how to change that "first cell" designation and, fortunately, I do which means now you do too!

Ctrl + . (hit the key for the **period**)

Yep - it's really that easy. If you continue to hit **Ctrl + .** then you'll notice that the unshaded cell will rotate around the four corners of the currently selected cell range.



Basically, move the unshaded cell to the corner opposite of where you wish to expand (or collapse for that matter).

Once it's moved hold down the **Shift** key and use either the mouse or keyboard to move the selection area to where you actually need it.