Nofrillstech Network Mini-factfile 28.3.12

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Networks are becoming increasingly popular, but, caution is needed before commitment, and very real reasons for their installation should be established. Networks can be complicated to set up, and any computers involved must be modern enough to be rendered network-capable, same O/Ss is a distinct advantage. **There are many books and references available regarding networking**, including those manifested by **asking Google**, so **Nofrilllstech** only intends to provide some general tips as a basis for furthering network understanding. **With networking hindsight, Nofrillstech** also **strongly recommends** testing and evaluating elsewhere, the type of network installation you will require before committing your own systems. (See also **Windows XP Pro. Network Administration, PC Help Desk, Windows Vista/Win7 for Starters,** and, **Windows Vista/Win7, The Definitive Guide,** all listed in **Computer Beginners Management Survival Factfile References)**

For data transfer, **USB Data Links, or USB flash drives** may suffice for simple in-house use…? **Good removable media and/or supplementary HDD backup** will serve most computer data exchange purposes for the average computer manager, are also more directly secure, and will still be maintained in some form by any sensible network operator anyway!

There are network links between systems, as well as links to LANs and WANs, and any type may also connect to the Internet, all of which being 'networks', and of greater or lesser complexity. So, if a network is to be set up, first plan it on paper, then, consult detailed help as and when required, which includes for hardware requirements, such as modem, router, cabling, etc., as well as for software requirements. **LOG YOUR PROGRESS, OK,** and that includes all usernames, passwords, screenshots, etc, then store safely. **Note that passwords are not recoverable from some modem/routers..!**

Simple computer networks will require crossover cabling when using a simple modem, and for Ethernet networks, there must be cards installed, and for more than two computers, **switches** or **hubs** will be required. Modem-Routers are now standard, and the router also provides an extra level of data package scrutiny. **Wireless networks** may also require cards, as well as **wireless-capable routers** and special **antennae, including on networked systems**. There may also be extra software installation required. **Broadband modems usually have direct cabling, and their crossover facility is inbuilt.**

Portable Wifi 'dongles' can be used with any system, and are useful as a 'known good' backup, as are cables in their turn. Sometimes installations will proceed easily, sometimes they will need to be checked every step of the way. **3 and 4G Wifi dongles** supplied by providers are handy, tho a contract and $$$ will be involved. **Portable BB USB modems/dongles** are just simple mobile phones that draw power from a computer, and thus connect wirelessly to the Internet, the best option for independence and portability within specified mobile signal range. (See also **Repairing and Upgrading Your PC,** Ch 14, **References, Computer Beginners Management Survival Factfile.)**

If major re-installation ,such as HDD or O/S replacement, in any networked system, should occur in the future, **the network will need to be repaired, even fully reinstalled.** Any difference between networked computers such as O/S software, motherboards, BIOS/CMOS, on-board or expansion card sockets, Ethernet, wireless, modem, Firewalls, and other software tweaks, can/ will affect networking set-ups in some way; thus, any changes to an established network will also have a knock-on effect, and new additions and other alterations will mean even more tinkering. This is always the price of accommodating software and **hardware universality** within networking, while using **Microsoft software** and **IBM-Wintel-ISA** clone PCs. Major user-friendly networking improvements are still in the future, although **Vista/Win7 has improved network capability**. A custom program such as **Network Magic**($) may also make networking easier.

For business purposes especially, networks need solid security, and, minimum service down-time. For those not so computer-savvy, prepare to pay for ongoing network monitoring as well as the cost of initial establishment. For the **do-it-yourselfers**, be prepared to persevere, but, most importantly, have your network setup planned from the hardware layer through to successful software operation, **as all stages must be inter-operational.** In addition, successful **Internet connection** is yet one more network layer to complete and configure, and a suitable ISP will need to be engaged as either a dial-up or broadband provider. **NTFS should be installed on all your networked systems to optimise data security and integrity, regardless of network type.**

Network cards will also serve for either network or broadband connection. The same and/or compatible network cards and security programs should run on networked computers, and preferably with the same O/S. More modern computers have network facilities built into the motherboard. 2000/XP Professional and **Vista/Win7** should not require extra software installation, for Ethernet at least, although **XP Home** may need a network plugin. If you are proposing to network a **Windows 98** system to more modern systems, professional, or at least well-informed, help is definitely advised. **Single PC modems** can handle a network Internet connection through the principle computer, but multiple direct computer connections do require an appropriate multi-socketed modem, whether dial-up or broadband.

Apart from an Internet modem, a combined router/switch is also advised, especially with multiple ports for any future network expansion, and routers also provide firewall security. **A hub only splits data streams, whereas a switch differentiates and redirects data streams to specific destinations.** Note also that, **when setting up a network with a router, the router is classed as another computer,** and, when connecting to the Internet, itself a network, the router will

have an LAN IP address, and, an internet address conferred by the ISP. **The router is also the network gateway. Straight or crossover cable can both be used with a modern router.**

Set up networks using **Network Options**, and usually, when setting up a simple home network of two or more computers plus the router, **Automatic IP Addresses** assigned by DCHP will be sufficient, but if there are problems, then first establish **the router address**, eg, 192.168.0.1, and then assign further addresses to networked systems as 192.168.0.2/3/ 04, etc. (Refer to the router brand's Home Page as necessary for relevant numbers.) The **Subnet Mask** is always 255.255.255.0, and a subnet address of 0.0.0.0 denotes a hardware conflict that must be resolved. **Manually-configured DNS addresses** should not be required for simple home or office networks. **If necessary, to find any existing network icons not appearing in My Network Places, use the Search Facility, and then copy or drag them to the Desktop.**

RUN/cmd/ ipconfig **or** ipconfig /all **will show network details, including IP addresses, useful when checking consecutive automatic IP addressing. To establish network link integrity between linked systems, utilise RUN/cmd** ping 192.168.0.? **which will test the digital link, then post an appropriate message. 'Not Found' is bad news, 'Timed Out' means check your settings, and a positive reply is the best news of all! All networked systems must be part of the same Workgroup, (do not use MSHOME, this can be hacked easily), and ensure that IP addresses are both properly configured, and at least consecutive. Sometimes simple Restarts of modem or router and of the computer can solve networking problems, especially after tinkering...!**

Just expect to manually tinker with software, including card addresses, Computer and Network names, IP addresses, pinging, and also when dealing with firewall and file-sharing permissions, **(especially Windows Firewall, best to turn off and use a custom firewall, which will also complement the firewall functions of the router)**, as Network Setup Wizards do not always deliver as expected. **Browsers** also must be configured in Tools, to automatically, or otherwise, connect to the Internet. **Apart from the excitement of establishing a network, decisions will also need to be made re File and Printer Sharing, Application Sharing, Drive Mapping, etc., and what you do then will depend, in turn, on the need for network security, especially that required for wireless networking. File and Printer Sharing can be activated as the network is being installed.** Vista/Win7/etc promises easier networking, but, heuristics will tell…?

Broadband must be activated via Internet Options and Network Connections as well as via modem or router settings, unless the network card was already installed prior to O/S installation, so, always check manually for correct settings, whenever an Internet network connection is not at first successful. Broadband modems, when configured, should store account details of username and password, (erasable by full un/reinstall), and then, be portable between any other simple Broadband-ready systems, via Broadband-ready connections, and within any given ISP's service range. Modem browser addresses could be 10.0.0.1, 10.1.1.138, 192.168.0.1, or 192.168.254.254, and, u/n **admin**, p/w **admin**, by default. **(RTFM!) Both Network Connections and your browser will need to be set to make, or unmake, a proxy connection. Default setting is for automatic finding of an IP Address in both cases.**

In general, **Network ID** is not necessary for home networks, **Network Places** is for network links, **New Connection Wizard** is for dialup and cable modes, **Network and Wireless Setups** really are for networks, and must be activated appropriately on all participating computers. **Broadband** should manifest as a separate network, in lieu of using **Network ID**. Do not confuse **LAN** with **WAN**. Note that broadband providers, just as for dialup, usually only provide help up to the modem interface, and Helpdesk quality is always a lottery anyway. **A reliable local network specialist is always good to know..!**

One major networking tip is to use PrintKey 2000, or Gadwin Printscreen (Vista/Win7), **to take a snapshot of each step as the network is installed,** then name and number each such graphic step, as well as print out a **consecutively paginated and annotated hardcopy log** of what was done. Trying to remember such a complex operation in such detailed entirety is not possible, especially as an occasional one-off, and, if a coherent record is not kept, you will then need to start from scratch again, or, pay someone else if the network needs repairs or re-installation, **which it will, OK!**

Thus, patience will be needed for successful computer networking, do not expect miracles, and, **do consult experts beforehand, OK!!** The more computers and peripherals are networked, the more complexity and possibilities of conflict ensue. **For networks to actually network, all involved computers must be operating,** so, consider whether ad hoc file-swapping could be just as effective with just a **flash drive** as a power and time-saving alternative, as well as a prudent security measure where this is also applicable. Note again that **wireless** networking and Internet access are potentially less secure to operate, (not that any network can ever be made totally secure?), although this is particular standard is slowly improving with newer encryption facilities. Newer TVs with a USB connection do not have to operate via a computer, just connect an external drive via USB, and locate with TV controller. Note that flash drives should be used sparingly for this purpose, as they have a finite lifespan.

However, if what is required is just a no-frills, user-friendly, easy-install data link between two contiguous always-on computers, (at a maximum of two metres **unpowered**, anyway), then do consider a simultaneous **USB Data Link.** Probably you will install from a CD, and a mutual **USB data-link cable** will be required. **But**, there will be an icon installed to click on, (in **each** Desktop), there will be no problems with firewalls, a double Window display will be on each Desktop, and file exchange is just simple drag-and-drop!

Nofrillstech has dabbled in networking, and has found this both much too finicky and expensive for present Home purposes, and thus, **long live flash drives**, literally! **Wifi Dongles Rule, OK,** for **Nofrillstech portable computers** used away from home! Plus the added benefit of freed PCI slots, if Ethernet is not on the motherboard! **But, once again, your own personal choice will prevail, of course.** The great advantage of having **Broadband and/or ADSL** is simultaneous use by phone, Internet and Fax, regardless of connection speed, and the overall bandwidth benefits are far beyond what dialup can ever provide. **For sizeable businesses, however, networks and Broadband are by now both absolute and cost-effective necessities, and tax breaks will ease the overall financial cost of installation and maintenance.**

Meanwhile, do not abandon your dialup facilities, whatever your broadband technology, and keep them operational on all involved computers, especially business computers, because individual dialup will continue to be an important Internet backup if/or when either the broadband network and or LAN or WAN networks have difficulties and/or downtime. With luck, your ISP will enable dialup backup to coexist with your Broadband account. If you have wireless broadband, then at least be sure that your cable broadband facility is retained for backup.

Increasingly, new buildings and private homes are becoming digitally 'wired', and, of late, and even rendered 'wireless', as networking infrastructure becomes more and more complex and ubiquitous, whether as a useful information centralisation or reticulation tool, utilitarian communications medium, or just as mandatory architectural fashion accessory. **Note also that personal wireless networks, and other contiguous wireless networks, can be disrupted by EMI, as well as posing immediate external security risks. Cabled networks, at least, do circumvent or at least forestall these particular problems.** Most importantly, whatever the means of contact, potential use, or planned or unplanned ultimate purpose, **networks must have a redundancy factor built in**, as the scope of failure and after-effects will only be further exacerbated in proportion to the extent of reliance on the original network.

So, there must be simple backups planned in, for network software or for hardware, and flexibility of these backups must be just as flexible as the new networking was purported to become. When a network fails, including via the router, then just plug a computer directly into a modem if urgent Internet connection is required, **aka 'known-good' testing. Power outages or fluctuations** can be a primary cause of network system failure, as much as any network component. If the complexity of a network is to be protected, then power reticulation, filtering, and monitoring, should be utilised, not least in the form of the humble **UPS/SPS**, positioned in the network where it is most usefully deployed, between the network hardware and the mains power supply switch on the wall. Also phone-line power filters, such a on a power board. (See also **Appendix 2, Computer Beginners Management Survival Factfile.)**

A 'RAID mentality' is therefore increasingly required when planning redundancies in networks, no matter how humble. **At the simplest level, a flash drive can always ensure useful data transfer**, just as a manual handle on a wall can open and close shutters when the thermostatically-controlled 'clever house' looses contact with the electric motors that are supposed to control micro-climatically sensitive window-shutter deployment. **If the mains power supply,** whatever its generating source, is ever compromised at any time, and/or for any length of time, then resorting to those old-fashioned utility 'handles', UPSs, and portable flash drives, (if data is regularly backed up, of course), will definitely be a blessing!

The First Law of System Backup is, that the more levels of operational complexity there are, the more fundamentally important RAID-oriented planning becomes, given that here 'RA' means Redundant Array, 'D' can mean Disks and/or Devices, 'I' can mean Independent and/or Inexpensive, and that those 'systems' can also manifest as types that include digital networks as well! Make Desktop snapshots of extant network settings, soon as, OK!!

The First Law of Online Network Backup is actually to get a new modem/router from your ISP, on a contract, which means it will be 'free', and, that modem's factory settings will always be set up to keep network data intact, so that, if you need to reset thus, all that will happen is that password settings will need to be renewed, the rest should/maybe/will remain intact. **As well, the ISP Help-Desk will always be there to help you anyway, as part of your contract.**

Fully resetting a modem can be done by holding down the reset button of the modem, whilst restarting the computer to which it is attached. This is especially useful for wiping passwords. **Resetting can also be done via the 192.168…. egress,** tho a password may be still needed in this case. **Help Desks are then worth having access to, unless you have been able to save those Desktop snapshots of extant network settings.**

Simple Network Troubleshooting:

1) **First Rule for Internet connection failure**, when there has been no other indication of any system failures, is to suspect your Provider, so, before looking for problems, wait and try again to see if that aspect can be ruled out. Connection tweaks may be also needed, and will be supplied by your provider.

2) **Replug every connection** to do with Networking, check all cables for kinks, damage.

3) **Use alternative means of connection** to the Internet, substitute cable for Wifi, and/or vice versa.

4) **Apply known-good principle** where possible, to isolate any hardware faults.

5) **Tweak Wifi via alternative cable connection**, enable/disable, restarts, check access/encryption passwords, reset Browser access auto-settings, TCP/IP Properties, line-of-site or signal barriers, distance limit, Faraday effect, modem resets, Internet traffic overload..?, specific tweak requirements of a network.

6) Set modem/router to always-on, so that the provider does not mistake on/offs for some line problem that requires extra filters, thus slowing down the data flow.

7) All non-portable systems should have line and power filters, which will remove EMI noise, and protect components.

8) Line-testing for quality of input traffic signal may reveal interference, especially if problems are intermittent

9) A known-good alternative system will show if the **Network system** is OK, thus, check to isolate problems of hardware or software in the system under question, ie, if your neighbour in the cafe is OK, then work on your own portable computer, and with correct input from the 'known good'.

10) …..?

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