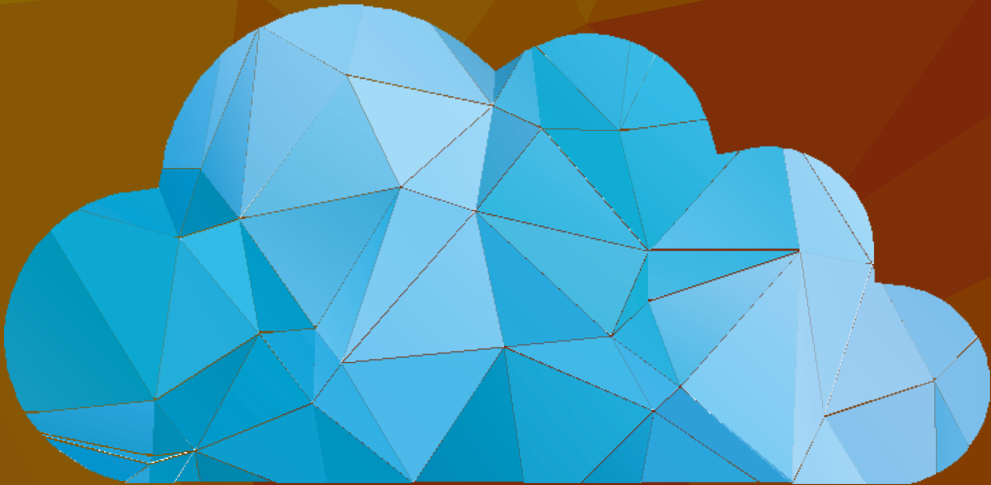

SET 6

NOVEMBER 2015

EXPERT TECHNICAL GUIDE

IT & INFRASTRUCTURE

GUIDE 2: COMPUTING BASICS

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COMPUTING BASICS

Most printers have by now accepted, and even embraced, the changes in our industry as we've moved from being a handicraft and mainly manual type of production, to being part of a wider media and communications industry. With this has come a change of focus, moving away from being mainly on the machines used in production, to be more on managing the data used in the workflow. This is not only about the raw material, the digital artwork, but also includes all the communications data used to plan jobs, make estimates, describe specifications for the actual job at hand, quality validations, device setups, job tracking etc. Like it or not, a printing company, and especially a digital printing company, needs to have a dedicated IT department, supervising and maintaining all aspects of the daily use of computers and networks.

There are four crucial components to a well managed IT system: hardware, software, network and interoperability. By nature they are tightly interlinked, so changes in for example hardware, may have a knock-on effect on what OS and software you can use, which in turn can effect interoperability.

In the early days of computing there were no standards and no interoperability. In the past, once you had decided on one type of computer, you were locked into using a specific, proprietary operating system, and dedicated software using proprietary file formats. You couldn't move files from one system to another, but today the situation is much better. You still have to watch out when moving files from one system to another, but fortunately there are many international standards for most of the critical applications, so we recommend working to established standards whenever possible. Since this work is constantly changing there are still gaps where you will have to make an educated guess as to what will be the best solution for you and your company.

HARDWARE – AFFORDABLE AND POWERFUL

We'll start looking at the actual computer, and the peripherals attached to it. Not so long ago there were several levels of computers, with almost exponential steps in price from one level to another. Today we don't talk very much about mainframes, supercomputers, workstations or personal computers. Instead we make sure we have enough storage (hard disks), a fast enough processor, enough RAM (short term memory) and relevant peripherals like for example videocards, monitors, scanners, bar code readers etc, for the user to be able to do his or her job efficiently. In some roles you may not even need a stationary computer: a laptop, or even a tablet or smartphone will do the job.

But in heavy duty prepress work especially, when talking servers and workstations, size and power matters. Not just any PC is suitable to operate as a central server or as a heavy duty Raster Image Processor (RIP). Or for that matter act as a workstation for image retouching and/or layout of multipage documents. Such functions still need lots of RAM, hard disk space and high end monitors, in order to be the right tool for the job at hand.

Most of the staff will be able to work on standard computers, or even manage with a tablet or smartphone. But some workstations need dedicated heavy duty hardware, like an image retouching station. The monitor itself has to be top of the range with regard to resolution and image uniformity. Shown here, an NEC SpectraView Reference monitor with 3840x2160 pixel resolution supporting true hardware calibration.

Wide format printers very often have their own RIP station next to them, but it might make sense to centralise this and use one workflow system to all devices, installed on a central server.

Regarding servers, it's all about speed and safety. For speed we need both fast hard disks and enough network connections in and out to serve the number of users without choking. For safety the data is typically stored in several places inside the server, through a Redundant Array of Independent Drives (RAID) system, alongside back-up solutions, both outside the server itself, and offsite.

Processing speed can be boosted both through using multiple processors, and through using multiple hard disks, splitting the data stream in order to be able to store and retrieve data faster. Even the hard disks themselves come in faster or slower versions, where the Solid State hard disks are the fastest. They actually don't contain any disks, and instead use flash memory, similar to that used in USB memory sticks. The good news is that they are at least 4-5 times faster than standard hard disks, but the bad news is that they are also more expensive, and can wear out and be fragmented just like traditional hard disks.

Some of your operators will, and are able to multitask. Give them enough computers to be able to start or supervise multiple processes, to help them be as efficient as possible. In some cases this doesn't need to mean that they have several computers physically standing at their desk. With distributed server capacity as described before, they might only need a couple of extra monitors with enough screen space for the different windows for those processes. The operating system used doesn't matter so much any more and there are solutions to mix windows from different processes and computers on the same screen.

STREAMLINE AND OPTIMISE

In large format print production it's quite common that every single printer is driven by it's own RIP. It has a dedicated workstation standing next to it, needing maintenance and service for both hardware and software. Leaving aside that the operators in such cases need training for many different user interfaces, one for each printer, the cost of maintaining this fleet of computers is substantial. Instead you should consider upgrading your central servers to be both fast enough and powerful enough to provide the processing power needed over the local network. A multiprocessor server, with lots of RAM, containing an array of very fast hard disks, will handle the RIP processing faster than a single, perhaps quite old and outdated, workstation. If you can get rid of all of those individual RIP servers, standing next to the printers, you will save on annual maintenance, free up floor space, and gain processing speed. As another step, which we will not go into here, you can look into replacing the different RIP solutions with one that can drive all or most of your printers.

There might be more workstations that can be slimmed down using this distributed computer power model, but in some cases the workstation itself needs to have the right hardware installed to do a good job. One such case is workstations for high end image retouching and image manipulation. In this case the video card needs to be powerful enough to drive an often large monitor at high resolutions and bit depth. To achieve accurate colours the monitor (and the video cards) needs to support image processing of at least 10 bits per channel RGB, and ideally at 12 bit or even higher. The monitor itself needs to show accurate colours evenly over the whole screen area (this is called having good uniformity) and not be prone to viewing angle distortions. In practice this means using a monitor using In Plane Switching (IPF) technology in the panel, not common in standard monitors, and so a bit more expensive. There are still workstations that must be configured with specific hardware components in order to be fit for purpose. But for a large part of the workforce, standard Macs and PCs will do the job, as long as enough attention has been paid to the network capacity and the servers in use.

GOOD HOUSEKEEPING RULES

Computers have been made easier to use over the years, thanks to both better user interfaces in the operating systems and the software. But there are some housekeeping rules it still makes sense to follow, to prolong the life of the computers, increase performance and reduce maintenance requirements. Most environments have some degree of dust in the air, and since a computer acts almost like a vacuum cleaner, sucking in air in order to cool the electronics inside, it's good to clean them out now and then. For the hard disks, be it conventional ones or solid state drives, the data tend to get fragmented over time. The computer will work faster and more efficiently if its storage is defragmented regularly.

Regarding back-up, this is a combination of hardware and software functionality. Make sure you test the back-up function now and then, check that the back-up data media really can be read back and restore the data. There are horror stories about back-ups done for years, and when needed they didn't contain any useful data. Also make sure you physically have the data stored in different places, in case of fire or burglary. Professional thieves unfortunately know that printers use state of the art computers especially in the prepress department, and so go to great lengths to get to them. Prepare for worst case scenarios, and it won't be so bad if and when it happens.

Finally ergonomics and sustainability come into play when we talk about hardware. Thankfully the computer manufacturers in general have been quite hard at work in this area, so power consumption and the use of hazardous components (or not) has been improved over the years. Don't use old computers longer than reasonable: it might be a false economy. Be prepared to replace them with greener, less energy consuming, faster and more powerful equipment, as part of a rolling upgrade program.