Selecting a Computer for Kaluza 1.2

The Kaluza software requires a Microsoft Windows PC. If you have one now, it´s likely that Kaluza will run on it. However, Kaluza offers the ability to dynamically update gating and statistics in real-time. This kind of analysis can be very demanding and you may find that you´re not happy with the way your current system handles it. While you can dial back this feature so that it works on your system, you may want to take this opportunity to upgrade to a better one. This guide helps you ensure that whatever you pick will meet your needs when you use Kaluza. What everyone calls a computer is really a computer system, and the pieces that make up this system determine how well it will work with Kaluza. It´s easiest to break this down into the main components.

Display:
The display subsystem has a really big impact on your Kaluza experience. At a minimum, you need a monitor that can handle 1024x768 with a normal display adapter. However, Kaluza has been optimized for high-resolution wide-screen displays. If you´re getting a new desktop system it is recommended that you get a 24-inch wide-screen monitor capable of 1920x1200 resolution. If you are working with enough plots, a 30-inch 2560x1600 display is very nice. However, it does cost a lot more and take up quite a bit of space. You don´t need a high-end display adapter, but you may want to get an NVidia brand one, depending on your other choices. (See below for details.)

Hard Disk:
Kaluza doesn´t have demanding hard disk requirements. Version 1.2 only takes up a little more than 20MB of space, and there´s no routine disk access required. However, depending on the files you are working with you may want to make an additional investment here. If you´re working with a few 1MB listmode files, then the disk system won´t make much difference. However, if the files you´re using are tens or even hundreds of megabytes, you might want to get something faster. A good test is to take some files that you routinely use and copy them. If Windows can´t copy them quickly, then Kaluza can´t do any better. Some higher end options include high spindle speeds (10K RPM) and large on-drive caches. RAID configurations can also give you additional speed and data integrity. The bottom line here is that Kaluza doesn´t set the disk requirements; your data does. If your data is big enough that you struggle with it outside of Kaluza, then Kaluza will probably be slow to load it.

Network:
Kaluza doesn´t have network requirements, but just as with the hard disk requirements, you want to consider your data and what you do with it. If you´re going to keep your data on a network drive, then you should have the fastest connection you can manage.

Operating System:
Kaluza requires Windows XP 32-bit SP3, Windows Vista 32-bit SP2, Windows 7/32 bit and Windows 7/64 bit.

RAM:
Kaluza likes RAM. With a 32-bit operating system you can´t take advantage of more than 3 or 4 gigabytes, but it´s very nice to have that much. Exactly how much you need is determined by what you´re doing. If you only work with a few 10K event files at a time, you can probably get by with less than a gigabyte. If you are working with really big files, then you´re going to want more. Generally 2GB is a good starting point. However, RAM is pretty cheap and if you have the choice you should probably get 3 or 4. (See below for one exception about the way Kaluza uses RAM.)

CPU:
CPUs have gotten fast enough that for many tasks they´re almost too fast. If a 2GHz CPU recalculates your spreadsheet instantly, then do you really need a 3GHz one? If you´re using Kaluza, especially with lots of events and the dynamic update feature on, then the answer is yes. Lots of things determine how fast a CPU is, but you only usually have control over brand/model, clock speed, and number of cores/CPU count. (A core is the heart of a CPU. You can have more than one on a physical chip, which will make your computer faster if the software you´re using is written the right way.)

For Kaluza, the brand and model isn´t much of a deciding factor. Certain ones benchmark faster than others, and the faster ones are better for Kaluza, but it will work with all of them. The most important things for Kaluza are the number of cores and the speed of those cores. There´s no hard and fast rule, Kaluza will use whatever you give it, but this table gives some general guidance:

Events	Cores
10,000	Single
100,000	Dual
1,000,000	Quad
10,000,000	Dual with Tesla card

The bottom line here is that for files with only 10k events or so, just about anything is acceptable. As you get into the hundred-thousand event range you need to be providing more power. When you get up to a million events, it takes some serious hardware to recalculate everything in real time. Of course, you can always turn down the dynamic update, but why buy a new system if you´re going to do that?

Tesla:
Throughout this guide, reference has been made to a special configuration, and the Tesla is it. The Tesla is a supercomputer coprocessor card from NVidia called the Tesla C1060. If Kaluza finds one when it starts, it will use it for all of its calculations. This card has 240 CPUs, 4GB of RAM, and is the ultimate way to process large amounts of data with Kaluza. If you´re using this card, you don´t need extra CPU cores or extra RAM because Kaluza uses what´s on the Tesla card. Be warned that the Tesla card has some unique power requirements. If you want to use one, it is best to build a system around it rather than try to add one to an existing system. It´s usually best to start with a vendor´s workstation class system if you want a Tesla Kaluza workstation.

Recommended Systems:
You may just want to buy a system that someone else has configured and tested with Kaluza. We have several such systems, listed below:

Tesla Workstations:	Model	Link
Dell	Dell Precision T5500 Tower Workstation	🔵
Dell	Dell Precision T7500	🔵
Lenovo	S20 Configuration with NVIDIA Tesla C1060 or C2050	🔵

High-end non-Tesla Workstations:		
Dell	T5500 4GB dual CPU	🔵
Lenovo	S20 4GB dual CPU configuration	🔵