

ITFreeTraining



Keyboard, Video, Mouse

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In this video I will look at KVM's. KVM's allow you to control multiple computers using a single keyboard and mouse. This video will look at how you can use a KVM to save you money and space.

Keyboard Video Mouse (KVM)

- Multiple computers redirected to a keyboard/video/mouse



0:12 KVM or Keyboard, Video, Mouse, does as the name suggests. It takes a keyboard, monitor and mouse and connects them to multiple computers. To understand how this works, consider that I have three different servers.

In order to use these servers, we need a keyboard and mouse to supply input, and a monitor to see the output. In a server room where space is limited, you probably don't have the room to install extra keyboards, monitors and mice. This is particularly true when you have a server room that may have hundreds of servers in them. Consider the cost of having a separate keyboard, mouse and monitor for each server. Also, consider that once a server is setup, except for the occasional maintenance, you will probably rarely control the server by using the keyboard and mouse. Thus, the cost of supplying individual keyboards, monitors and mice is hard to justify.

This is where a KVM comes into play. In this example, the three servers are connected to the same KVM. At any one time, one server is connected to the keyboard, video and mouse. To change this, press the button, usually at the front of the KVM, to select which computer you want. Some KVMs may change the computer being used by you pressing a key sequence on the keyboard.

Let's have a closer look at how a KVM works.

Mechanical KVM

- Obsolete nowadays



1:37 The first KVMs were essentially a mechanical switch – the switch redirected the wires between each computer to the one common keyboard, monitor and mouse. These KVMs are essentially obsolete nowadays. The problem with these KVMs is that each time the switch is turned it essentially disconnects one set of wires and connects another set.

Disconnecting one set of wires and connecting another set caused all kinds of problems. For example, some computers would need to detect the keyboard and mouse when the computer started up. If the computer did not detect the keyboard and mouse, they may be disabled. This essentially means that when the computer is switched on, it would need to be selected on the KVM.

Other problems could also occur, particularly with the video when starting up. If the switch was not set to that computer, the computer would not be able to detect the video and may change the video resolution.

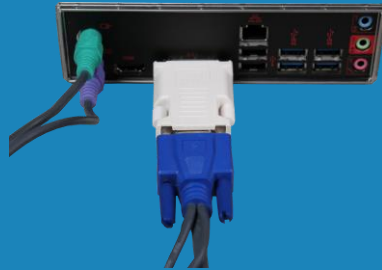
Other problems occurred when the switch was changed; the disruption in the connection could cause the keyboard, video or mouse to stop working. The reliability of the KVM would vary depending on its quality. This became more of a problem as video resolutions increased, so you can see why this kind of KVM is obsolete nowadays, but it illustrates the basic principal of how a KVM works. You can also understand why a KVM may also be called a KVM switch.

Basic PS/2 KVM

- Two computers plugged into same
– Keyboard/Video/Mouse



Computer 1



Computer 2



KVM

3:04 The next KVM that I will look at is a PS/2 KVM. This particular type of KVM takes two computers and allows them to be plugged into the one keyboard, video and mouse. It is just a matter of plugging each of the plugs into each computer and then plugging the keyboard video and mouse into the KVM.

Nowadays, you probably won't be using a PS/2 KVM, as the technology is pretty old. However, it does demonstrate the basics of a KVM in which you plug in your keyboard, video or mouse so it can be shared between your computers.

These KVMs use electronics to change which computer is selected, rather than switching wires. The electronics will emulate a keyboard, video and mouse, so when the computer is starting up it will think it is connected to one, even when it is not selected on the KVM. Some KVMs, however, either do a poor job of emulating or don't do it at all. If you have one of these KVMs, you may still need to have the KVM selected when you switch the computer on.

This shows the basic features; however, some KVMs come with more features.

High-End USB KVM

- Supports 4 computers/3 monitors per computer
- Audio support
- Hot key to change between computers



4:15 I will now have a look at a high-end KVM, so you get an idea what features are available. This KVM supports four computers and three monitors per computer. You won't find many KVMs that support more than one monitor, but as multi-monitors become more common, you will probably find more of these KVMs on the market.

This KVM also supports audio. If the KVM supports audio, you will generally find that it only supports basic two-channel audio and a microphone. Features like surround sound are generally not supported. Lastly, this KVM supports hot keys. This allows the user to press a key combination to perform a function. Generally, the key function is used to change which computer the KVM is using. For example, the user may press ctrl twice and then press the computer that they wish to switch to.

Many KVMs support hot keys, even the cheaper ones. Some KVMs also have the option to change the hot key if you want to. This KVM would be good for a high-end desktop computer environment. Let's have a look at what you might use in a server environment.

Rack Mounted Network KVM

- Supports 16 computers (256 Cascade)
- Remote access via the network
- Requires special cables



5:28 The next KVM that I will look at is a rack-mounted KVM with network support. It is not uncommon to find rack-mounted KVMs in a server room. Rack-mounted simply means that the KVM can be attached to a rack that is also used to attached computers and other network equipment.

In this particular case, this KVM supports 16 computers directly connected to it or 256 cascaded. Cascade means the KVM plugs into other KVMs which essentially allows one KVM to control and access the others.

The KVM can be accessed by plugging a keyboard, video and mouse directly into it, but it can also be accessed using a network connection. This is incredibly useful as it means the administrator can, in this case, access up to 256 different servers without leaving their desk. Unlike other remote-control software which must be installed on the computer, a network KVM requires no software. This means the technician can access the server BIOS and see the startup sequence on the computer. This can be a life saver. Essentially the technician could be accessing a server from the other side of the country. If a BIOS message appears during boot up requiring a key to be pressed, they won't need to visit the server room to press a key on the keyboard.

In this particular case, you may have noticed that there are no inputs for keyboards, video or mice. For this KVM, special cables are required to plug into the back of the KVM. In this case, an RJ-45 cable is required which will have the required plugs. This example cable has VGA and PS/2 connectors, but there are a wide variety of cables available; for example, cables that support USB and audio.

This illustrates an important point. When you purchase a KVM, the KVM may require additional cables in order to operate. Different KVMs will require different cables. Standard cables may not work and you may need to purchase cables designed specifically for that KVM. The manufacturer will of course sell you the cables you require for the KVM, and the point being, you should factor in the cost of the KVM and any required cables before your purchase the KVM. A cheap KVM may not end up being that cheap once you factor in the cost of the cables to go with it. I will next look at what you should consider before purchasing a KVM.

KVM Considerations

- Max number of computers connected
- Max resolution of the KVM
 - E.g. 4K x 2K@30Hz (Won't support 4K 60Hz)
- Additional options
 - Audio/Hot keys/Remote control
- Connecting external power
 - If optional may make the device more stable
- Additional cables/adapters that may be required

8:03 Before you purchase a KVM, there are a number of things to consider. The first is the maximum number of computers that you are planning to connect. The more computers you can connect, the more expensive the KVM will be. Generally, the larger KVMs are used in server rooms.

The next point to consider is the maximum resolution that you want the KVM to support. It is important to check this carefully. For example, you will find some KVMs on the market that support 4K; however, only support 30Hz. So before purchasing the KVM, check the maximum hertz it supports as well.

Another point to consider is that, even though the KVM may say it supports higher resolutions, generally the cheaper KVMs may have problems supporting these resolutions. With KVMs, you get what you pay for. The cheaper KVMs may support high resolutions, however you may experience random video disconnects. This may manifest itself as a black screen for a second or two. If this happens a lot, it can be particularly distracting. At worse, you may lose the video completely and need to reboot the computer.

The next point to consider is what additional options you want. For example, do you want a KVM that supports audio, hot keys or remote control? Most KVMs support hot keys for changing which computer is currently being used, but not all. Like all things in computers, read the specifications carefully before purchasing.

Your KVM may also have external power. Some KVMs can draw power from a computer

connected and don't require external power. If the KVM does not require external power, but has the option available, connecting the external power can make the KVM more stable. If you are having problems with the KVM and the external power is not connected, try connecting it to external power to see if it helps.

The last point to consider is what additional cables or adapters do you require? A KVM will generally support certain connectors. If your computer has different connectors, you may need to purchase an adapter to convert the connector to the other type, if it is available. All this adds to the cost of the KVM and you should consider this cost before you purchase the KVM.

That concludes this video on KVMs. I hope that you have found this video useful and I look forward to seeing you in other videos from us. Until the next video, I would like to thank you for watching.

References

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"CompTIA A+ Certification exam guide. Tenth edition" Pages 410 – 412

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"File:Data Transfer Switch - video and keyboard-8613.jpg"

https://commons.wikimedia.org/wiki/File:Data_Transfer_Switch_-_video_and_keyboard-8613.jpg

Credits

Trainer: Austin Mason <http://itfreetraining.com>

Voice Talent: HP Lewis <http://hplewis.com>

Quality Assurance: Brett Batson <http://www.pbb-proofreading.uk>