Magic SysRq keys Alt-SysRq-RSEIUB

You will need to keep holding the sequence keys for a small period of time before going to the next one so that their actions can be carried out properly.

Restarting Ubuntu safely when it is frozen

Alt+SysRq+R+S+E+I+U+B

Raw (take control of keyboard back from X), tErminate (kill -15 programs, allowing them to terminate gracefully), kill (kill -9 unterminated programs), Sync (flush data to disk), Unmount (remount everything read-only), reBoot.

Safely shutting down Ubuntu when it is frozen

Alt+SysRq+R+S+E+I+U+O

shutdOwn

Brief descriptions about the keys you can use in magic SysRq sequences

0 - 9 - sets the console log level, controlling which kernel messages will be printed to your console so that you don't get flooded.

B - restarts the system without making steps to ensure that the conditions are good for a safe reboot, using this key alone is like doing a cold reboot.

E - sends SIGTERM to all processes except init. This means that an attempt is done to end the current processes except init, safely, e.g. saving a document.

F - call oom_kill(Out Of Memory Killer), which will kill a process that is consuming all available memory.

H - displays help about the SysRq keys on a terminal though in actuality you can use any key except for the ones specified, to display help.

I - sends SIGKILL to all processes except init. This means that all the processes except for init are killed, any data in processes that are killed will be lost.

K - kills all processes on the current terminal. It is a bad idea to do this on a console where X is running as the GUI will stop and you can't see what you type, so you will need to switch to a tty after doing the magic SysRq.

L - sends SIGKILL to all processes, including init. This means that every process including init will be killed, using this key will render your system non-functional and no further magicSysRq keys can be used. So in this case you will have to cold reboot it.

M - dumps memory info to your console.

O - shuts down the system via ACPI or in older systems, APM. As in key "B", using this key alone is like a cold reboot(Or in this case, a cold shutdown).

P - dumps the current registers and flags to your console.

Q - dumps all timers info to your console.

R - takes keyboard and mouse control from the X server. This can be useful if the X-Server crashed, you can change to a console and kill the X-Server or check the error log.

NOTE: The documentation refers to this key's task as "Turns off keyboard raw mode and sets it to XLATE", but I suppose it's safe enough to assume that it takes back control from X.

S - writes all data from the disc cache to the hard-discs, it is a sync and is necessary to reduce the chances of data corruption.

T - dumps a list of current tasks and info to your console.

U - remounts all mounted filesystems read-only. After using this key, you can reboot the system with Alt+SysRq+B without harming the system.

W - dumps uninterruptable (blocked) state tasks.