

Viruses – biological and digital

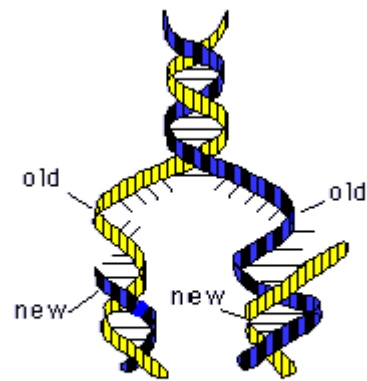
‘Computer Virus’ is a metaphor that explains the working of this scourge of the PC, says **S.Ananthanarayanan**.

The real viruses that attack living organisms are complex molecules that share with living things the ability to reproduce. In fact, the only thing a virus does is to reproduce. And all it needs for this is the bare essentials to make copies of itself, a strand of DNA, the basic genetic formula.

Cells and DNA

A strand of DNA, in fact, is the same thing that enables a ‘regular’ living cell to reproduce. The genetic code of a complex thing like a cell is in its chromosomes, which are a collection of ‘genes’. Genes contain the blueprint for building specific proteins in a coding built up over the length of the DNA, as a series of specific combinations of just four kinds of chemical units.

When a cell is ready to reproduce, the chromosome, which has the shape of an ‘interlocking’ double helix, separates into its two ‘complementary’ strands. From the surrounding chemical ‘soup’, each strand soon collects the exact match at every bit of its length and the strands become ‘copies’ of the original chromosome.



Each strand grows a new partner

The cell then splits into two, each with a copy of the coding to produce various kinds of proteins, enzymes, etc, which defines the identity of the cell.

The simplest code.

While cells have complex genetic coding, to mark out their various functions, one can think of a cell with very rudimentary coding, whose effect is just to give the ‘cell’ a particular shape. This cell will also reproduce, like any cell, but it has no instructions to do anything else!

This is the virus, a kind of cell which can attach itself to specific cells only, because of the particular complexities of its shape, and which then makes it its life's mission to enter such cells and just use the chemical raw material in the cells to go on reproducing. And as the virus is doing this, the host cell can no more perform its legitimate function. And when the host is full of newborn viruses, it bursts and releases its deadly contents to go and infect more cells.

Computer viruses

Computer viruses are not cells or chemical things. They are bits of computer code, small programs, which may do simple or complex things, or may not do anything, but which can induce any program that they enter to create copies of the virus program.

Sometimes, this copy production only results in more and more programs doing some relatively harmless thing, like showing a picture, while the copies of the virus get passed to other computers through e-mails, etc. A little worse, the virus may prevent the 'host' program from functioning properly. And the worst is the 'malicious' virus, which does evil things like deleting files or modifying data! But the main property is that this kind of program can reproduce itself, in a 'host', usually at the expense of some resources, at least.

And all this is so much like biological viruses, that the computer variety are called 'viruses' too. The name is thanks to Frank Cohen, a PhD student in the early 1980s in California, who first thought of such 'self-replicating' software.
