

Epidemic spreading in complex networks

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The Internet, as well as many other networks, has a very complex connectivity recently modeled by the class of scale-free networks. This feature, which appears to be very efficient for a communications network, favors at the same time the spreading of computer viruses. We analyze real data from computer virus infections and find the average lifetime and prevalence of viral strains on the Internet. By developing a

theoretical model for the spreading of viruses on a scale-free network, we show that computer viruses on the Internet do not possess an epidemic threshold and usually show a very low prevalence. This new epidemiological framework rationalizes data of computer viruses in the wild and points out the most effective way to combat the spreading of infections.