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Comparative Study of Black Hole as a Hacker in Computer System with Black Holes in Our Universe

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***Abstract*— The present work discusses that how a black hole interacts with environment by computer technique and comparative study of the black holes as a hacker in computer system with the black holes in our universe.**

***Index Terms*—black hole, event horizon, Statistical entropy.**

I. INTRODUCTION

Black holes are the densest, most massive singular objects in the universe [1] having mass greater more than that of our solar mass and it has abnormal gravity so that nothing can escape from it. This black hole traps everything like light, sound; message and nothing can escape from it. In classical theory, black holes can only absorb and not emit particles. However, it is shown that quantum mechanical effects cause black holes to create and emit particles as if they were hot bodies with temperature $\frac{h\kappa}{2\pi k} \approx 10^{-6}\left(\frac{M_{\odot}}{M}\right)\kappa$, where κ is surface gravity of black holes and k is the Boltzmann constant [2], but according to the general theory of relativity: A black hole is a solution of Einstein's gravitational field equations in the absence of matter that describes the space time around a gravitationally collapsed star. Its gravitational pull is so strong that even light cannot escape from it [3, 4]. Sheenu and Roopam simulated black hole attacks in the Qualnet simulator and measured packet loss in the network with without black hole and investigated the effects of black hole effects on the network performance [5]. In the present work, we have discussed that how a black hole interacts with environment by computer technique and also comparative study of the black holes as a hacker in computer system with the black holes in our universe.

II. FORCE OF ATTRACTION OF BLACK HOLES TRAPPING LIGHT PARTICLES

Black holes are mainly characterized by mass, angular momentum (spin) and electric charge. Mass is the essential characteristics of any black hole. The simplest black hole has no spin and no magnetic field. This is called a Schwarzschild black hole. A black hole that has a field but no spin is called a Reissner-Nordstrom black hole. One that has both a magnetic field and spin is called a Kerr black hole [1]. The light is mostly available everywhere in the space, hence the light so called electromagnetic wave are mainly attracted by event horizon of the black holes. All the messages transmitting from one place to another place are in the form of the electromagnetic waves and these waves are hacked by hacker in the communication system. The black hole attracts the light particles by the force of attraction given by[7,10].

$$F = \frac{1}{4M\lambda} \quad \text{..... (1)}$$

and $$F' = \frac{1}{M\lambda} \quad \text{.....(2)}$$

The eq^{n} (1) and (2) can be expressed in terms of surface gravity as given below.

$$F = \frac{\kappa}{\lambda} \quad \text{.....(3)}$$

and $$F' = \frac{4\kappa}{\lambda} \quad \text{.....(4)}$$

The surface gravity (κ) of black hole is inversely proportional to its mass and the different black holes will have different surface gravity. Greater the mass of the black holes, smaller the surface gravity and vice-versa. The surface gravity (κ) has the same role in the black hole mechanics as the temperature in the ordinary laws of thermodynamics. The zeroth law of classical black hole mechanics states that the surface gravity (κ) of a black hole is constant on horizon [4,7] and the surface gravity (κ) can be thought of roughly as the acceleration at horizon of black hole[3]. The surface gravity (κ) of a black hole is constant on event horizon [8]. Hence eq^{n} (3) and (4) can be written as

$$F\alpha\frac{1}{\lambda} \quad \text{.....(5)}$$

The above relation shows that the force of attraction acting between black hole and light particle is inversely proportional to the wavelength of electromagnetic wave coming towards

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the event horizon of black holes. Hence the electromagnetic radiation of longer wavelengths is attracted lesser than that of others [10].

III. BLACK HOLE AFFECTING ENVIRONMENT & SIMULATION ENVIRONMENT

Black hole is natural phenomena in our universe. This black hole interacts with our environment. The black hole causes extreme deformations of space-time; it also creates the strongest possible deflections of light rays passing in its vicinity and gives rise to spectacular optical illusions [12]. At the event horizon of a black hole, this deformation becomes so strong that there are no paths that lead away from the black hole (wikipedia). The deformation of space time around a massive object causes light rays to be deflected much like light passing through an optic lens. Such an effect is due to gravitational lensing. Observations have been made of weak gravitational lensing, in which light rays are deflected by only a few arc-seconds. However, it has never been directly observed for a black hole. One possibility for observing gravitational lensing by a black hole would be to observe stars in orbit around the black hole [11]. In a similar manner, there is a some computerized system which hacks all the network traffic system and redirects to a specific node which does not exist at all. During this exact traffic disappear into the special node as the matter disappears into the black hole in our universe. So the specific node is named as a black hole. [6]. A black hole as hacker in the communication system has two properties. First, the node exploits the ad hoc routing protocol, such as AODV; advertise itself as having a valid route to a destination node, even through the route is spurious, with the intension of interrupting packets. Second the node consumer the interrupted packets [5].

IV. RESULTS AND DISCUSSION

In the present work, we have discussed that how a black hole traps the light particle (electromagnetic waves) passing near it and due to this action the space-time is distorted. From equation(5), it is clear that the force of attraction acting between black hole and light particle is inversely proportional to the wavelength of electromagnetic wave coming towards the event horizon of black holes. Hence the electromagnetic radiation of longer wavelengths is attracted easily than that of other radiation of shorter wavelengths. On the other hand, we have also discussed that how a black hole interacts with environment by computer technique and comparative study of the black holes as a hacker in computer system with the black holes in our universe. From equation (5), we conclude that the message or information of longer wavelengths passing from one place to another place in any part of our global system may be easily trapped by the black holes as a hacker in computer system like the black holes in universe. In black hole attack all network traffics are redirected to a specific node from the malicious node causing serious damage to the network. The detection of black holes in ad hoc networks is still considered to be a challenging task.

V. CONCLUSION

The message or information of longer wavelengths passing from one place to another place in any part of our global system may be easily trapped than that of the message or information of shorter wavelengths by the black hole hacker in computer system like black hole in our universe and all network traffics are redirected to a specific node from the malicious node causing serious damage to network in black hole attack system.

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