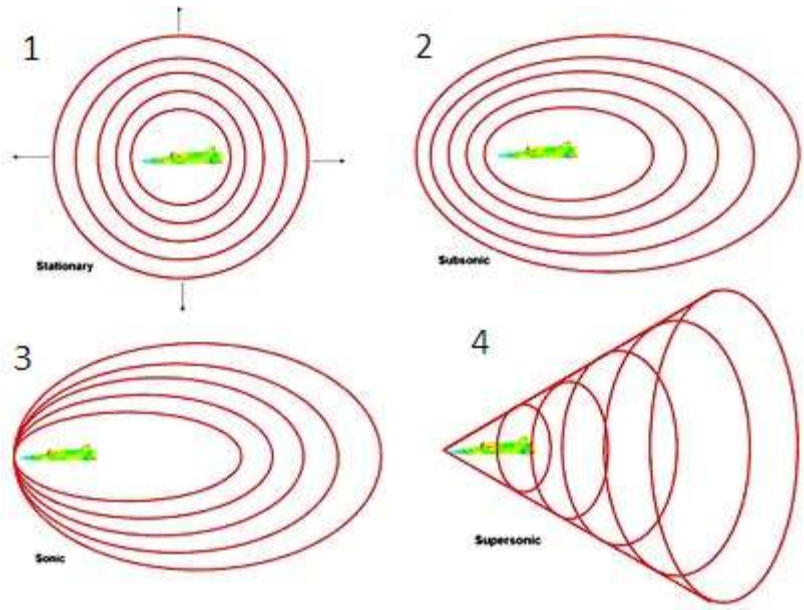
as we all know when an object e.g. aeroplane etc crosses the sound barrier they produces a sonic boom. So sir my question is why is that sound barrier produced and will same or different type of thing will also be produced when an object crosses the speed of light.

Answer:

A sonic boom is the sound associated with the shock waves created by an object traveling through the air faster than the speed of sound. waves form because of the nature of the propagation of sound waves through the air. Under normal subsonic conditions any body transmits pressure disturbances ahead of it in the form of sound waves (pic.1). When an object passes through the air it creates a series of pressure waves in front of it and behind it, similar to the bow and stern waves created by a boat (pic. 2). These waves travel at the speed of sound, and as the speed of the object increases, the waves are forced together, or compressed, because they cannot get out of the way of each other, eventually merging into a single shock wave at the speed of sound (pic 3). So at the speed of sound (Mach 1) the object is traveling fast enough to catch up with all of the forward radiating sound waves, forming a strong pressure wave normal to the object . This pressure wave can be strong enough to destroy the plane, as it destroyed many aircraft before the flight of the X-1 in 1947. If the vehicle has the proper design and has enough power to penetrate the shock wave by exceeding the speed of sound, it can out run the shock wave which then bends back to form a strong shock cone (pic. 4).



About second part of your question.

First of all, object with non-zero mass can't travel with the speed of light. According to Special Relativity the total energy of an object increases as its speed increases and approaches infinity as the object's speed approaches the speed of light. This means that it would take an infinite amount of energy to accelerate an object to the speed of light.

Secondary, speed of light is one of the fundamental physical constants, The speed at which light waves propagate in vacuum is **independent** both of the motion of the wave source and of the inertial frame of reference of the observer. This is the fundamental insight that Leibnitz and Einstein quantified. If you think about "normal" relativity as we see it happening around us every day, velocities are additive. For example, if I travel on a train at 60 MPH and throw a ball forward at 60 MPH, to observers on the train the ball is going 60MPH whereas for observers on the ground the ball is going at 120MPH. Conversely, if I throw the ball towards the rear at 60MPH, the observer on the ground would see the ball as standing still. I think it was Galileo who first quantified the mathematics for these types of relative velocities.

But as velocities apporach the speed of light the rules change - velocities are no longer additive. The speed of photons is always a constant for all observers, regardless of the observer's relative motion to the source of the photons. Hence if I am on a ship moving at, say 2.95x 10^8 m/s (~99% the speed of light) and shine a light out the front I will measure the speed of those photons as moving away from me at 3 x10^8 m/s (the speed of light). Similary, an observer on the ground would see me coming at him at 2.95 x 10^8 m/s and the photons coming at him at 3 x 10^8 m/s, not (3+2.95) * 10^8m/s. So the velocity of the photons is not additive. The only difference that the observer on the ground sees is that the light will appear very much blue-shifted (higher frequency photons) due to Doppler effect.

Some related links:

http://en.wikipedia.org/wiki/Doppler_effect

http://en.wikipedia.org/wiki/Sound_barrier

http://en.wikipedia.org/wiki/Speed_of_light#Upper_limit_on_speeds

http://imagine.gsfc.nasa.gov/docs/ask_astro/answers/970102c.html