What is the Vternal Network?

We have all got documents (videos, sound recordings or images for example) which we want to keep be kept secure even after we are gone. I, for example, have my Grandparents' wedding album from 1909. I keep that album in a drawer and hope that my children will one day put it in their drawer and keep it for their children.

The older the album becomes the more interesting it is. A thousand years from now, if it is still around, it would be very interesting not just to my descendants but to a wide audience; but the chances that the physical album will survive and still be readable a thousand years from now is very slim. It will probably be accidentally destroyed or simply lost - maybe someone will maliciously destroy it. So, the most difficult thing to arrange is for my album to be passed down through an unbroken chain of interested parties.

The Vternal Network is designed to be a place where you can put a digital asset (such as a picture) today and, without doing anything more, have it be accessible and securely stored for ever. This idea may seem far-fetched but I believe that we can build a network today which can be maintained over the ages and keep a copy of my asset in its bowels. Virtually every human being has assets they wish to pass to future generations and there are some items of general interest which lots of people may want to keep - such as the US constitution, the works of Shakespeare or the Bible, for example. Personally I want to take digital photographs of my Grandparents' wedding album and store them in the Vternal Network and not have to worry about what will happen if no-one is interested in them and I am long gone. The assets I put in the network should be available, given the right key to access them, in perpetuity. If the key is lost the album won't be easy to find and if it is encrypted may be un-viewable but it will still be there. If the key can be passed down through future generations (perhaps by engraving it on valuable things like jewelry), then future generations will be able to use the key to retrieve my album. If a future archaeologist finds a copy a key, then they will be able to get the corresponding asset out of the network. Even if the key is lost the asset itself should still be somewhere in the network and so long as it isn't encrypted, visible by anybody in the future who happens to come across it.

I believe that it is possible to create a digital network which can realize my dream of storing things for ever. It is my belief that the Internet will never go away. It may evolve and the technology on which it is based may change beyond anything we can envisage today but the Internet will still be around from now on so long as there is technological human life; furthermore the bridge between today's technology and the future will form an unbroken chain and so long as assets are moved with technology advances there is no reason any data should be lost. As the network evolves any data it contains can travel with it. The creation of the Internet was like the invention of printing or writing. Once done it can never be undone or forgotten as a practical matter. I used the Arpanet, the father of the Internet, when there were only a few nodes and those nodes could all have been destroyed but today there are literally billions of nodes on the

network and they could not be turned off or destroyed without a concerted effort by all of humanity - it isn't going to happen.

You can also see the Vternal Network like a religion or political creed. It will evolve, but with enough believers it will never go away. The only reason it might fail is if all those interested in maintaining it go away but I believe that given the right start this can be prevented or made very very unlikely. I call the organization which evolves and maintains the Vternal Network for all time the 'Vternal Brotherhood'. Just as the movie 'The Mummy" has a tribe which protects the mummy's tomb for thousands of years, so the Vternal Brotherhood can protect the network and the assets it contains and evolve the technology on which the network is based so that data will never the lost. I cannot see why the majority of humanity would not want something like the Vternal Network to exist and that is its strength.

This is quite different from the current 'Cloud' which is tailored for storing data today for easy, fast and secure access by authorized users. That is not a bad goal and there has been a lot of work done to create such clouds. Most of the big names - Apple, Amazon, Google, Microsoft etc. offer a cloud which you can use to store data securely, but these clouds are owned by someone, charge for access and are liable, over the long term, to go away with the loss of the data they contain. The Vternal Network is not 'owned' by anybody (although it is developed and maintained by interested parties) and designed to never go away. Most important there should never be any maintenance fees and once stored data should exist in the network forever without charge.

When I conceived of the VN ten years ago it was very difficult to get regular people interested or to understand what I was talking about. Today that isn't the case. The idea of a cloud, universally accessible, where anyone can store data forever isn't far fetched anymore and anyone with a smartphone gets the idea immediately. So, the time is right to get started. Now we have a different problem, there are a lot of networks which are superficially designed to address the same problem and although we are confident that the VN is different we need to convince ourselves and others that this is the case.

So my goal is to design a set of protocols and implement the software elements to get the ball rolling and to achieve a critical mass of users which will have a high chance of providing the pool of interested people to keep the network alive. This is not an easy task but doable. First and foremost the theoretical underpinnings of the endeavour need to be sound. Given a sound theoretical foundation and a sufficiently diligent and skilled set of implementers the vternal network can take shape and be deployed pretty quickly. Once the network has a critical mass there can be no going back.

Assumptions

- The Internet will last forever, it will never be turned off and there will always be a bridge between current and newly deployed technologies (good examples are: the transition

from IPV4 to IPV6 addressing; the move from wired to wifi connectivity; and the move from mechanical to solid-state storage).
- People wish to store data which requires no maintenance by them.
- People want to store data beyond their lifetime.
- If desired data needs to be unviewable by unauthorized users.
- Data needs to be configurable. For example, when it is viewable (its birthday) and in which jurisdictions it is stored.

Characteristics of the Network

- Nodes are pure peers.
- No center.
- No trust between nodes required
- Encryption of data a client-side feature only
- No Data deletion once stored
- No node has knowledge of the location of assets except those it stores
- Assets are stored on nodes. Each node donates data storage space to the network in proportion to what it wants to store.
- Assets are stored k (k=3) times of different nodes, preferably on different sub-networks
- Assets move periodically to new nodes.