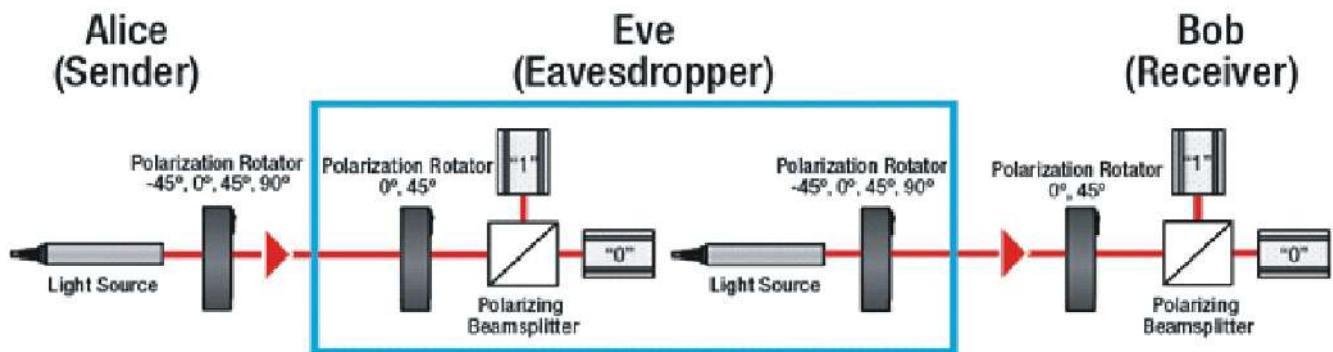


# DATA ENCRYPTION USING QUANTUM CRYPTOGRAPHY



## Need for Data Security:

Unauthorized, careless or ignorant processing of personal data can cause great harm to persons and to companies. Firstly, the purpose of personal data protection is to protect the fundamental rights and freedoms of persons that are related to that data. The most important reason to implement data protection strategies is fear of financial loss. Data is recognized as an important corporate asset that needs to be safeguarded. Loss of information can lead to direct financial losses, such as lost sales, fines, or monetary judgments

Organizations across the globe are investing heavily in information technology (IT) to deploy the best cyber defense capabilities.

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## Why Quantum cryptography?

In common, the transmission of data is protected using encryption and is decrypted on the receiver's side using a shared key between the sender and receiver. Currently public key cryptography, based on algorithms such as RSA or Elliptic Curve, which is used to securely exchange data encryption keys.

The problem with this approach is that the security of the currently used public key cryptosystems is not well established and they are vulnerable to:

1. Human ingenuity: Public key cryptography is based on mathematical problems, which could be broken by future progress.

2. Moore's law: The increase in computing power makes it increasingly easier to break public key cryptography.

3. Quantum computing: Public key cryptography is vulnerable to quantum computing, which can solve certain mathematical problems exponentially faster than classical computers.

Quantum cryptography is a technology that uses quantum physics to secure the distribution of symmetric encryption keys. This technique is named as quantum key distribution (QKD). It works by sending quantum particles across an optical link. The Heisenberg Uncertainty Principle stipulates that in quantum physics observation causes perturbation. This is used to verify the security of the distributed keys.

In general, QKD combined to One-Time Pad (OTP) encryption to achieve security. However, this would impose strong limitations on the available bandwidth due to the fact that the key distribution rate of QKD is typically 1'000 to 10'000 times lower than conventional optical communications.

In practice, QKD is combined with conventional symmetric encryption, such as AES, and used to frequently refresh encryption keys.

## How QKD Works?

QKD solutions currently consist of key distribution appliances combined with link encryptions.

Two QKD appliances are connected through an optical fiber and continuously distribute key material, which they store until it is requested by encryption. These solutions work up to a range of 100km (optical attenuation corresponding to 20dB) and are thus deployed in metropolitan area networks.

Typical applications include secure LAN extension in corporate campuses or datacentre interconnects. The encryptors currently compatible with QKD are ISO layer 2 encryptors for Ethernet and Fibre Channel with link bandwidth up to 10Gbps and aggregated bandwidth up to 100Gbps.

### Mechanism:

Current systems use the mathematical technique, here 0's and 1's are used for encryption. And the common shared key is used to decrypt the data. The QKD sender transmits photons, one at a time, down the fiber to the receiving unit. A quantum property is applied separately to each photon, so this could be polarisation, phase or position to designate whether that photon represents a one or a zero.

Because of the nature of matter at this quantum level, the photons can be sent in a superposition state (any two or more quantum states can be added together and the result will be another valid quantum state), in each they have states representing both one and zero simultaneously. It's only when the photon is observed or measured it will collapse into a fixed state. If a third party intercepts the key transmission and reads it, they won't then be able to re-transmit it to the intended receiver in exactly the same state that it was initially sent in. If they try, the receiver will get meaningless data and it'll rapidly become apparent that someone is tapping the line.

### Benefits or advantages of Quantum Cryptography

- ❖ It is virtually unhackable.
- ❖ Fewer resources are needed in order to maintain it.
- ❖ It is used to detect eavesdropping in Quantum Key Distribution. This is due to the fact that it is not possible to copy the data encoded in the quantum state. If someone tries to read such encoded data then the quantum state changes the existing state.



**NIXON JEBASTIN**  
IT Admin

## UPDATES

## GOODS AND SERVICE TAX

The Union Budget 2019 has provided relief to GST-registered taxpayers with several new updates. One such amendment relates to the interest on the delayed payment of GST liability. This is a big relief for taxpayers, because, until this amendment was passed, interest has always been charged on the entire amount of tax paid after the due date. The present rate of interest on the delayed payment of tax liability is 18% per annum on unpaid GST. Such interest is charged on all modes of payment of tax, even when actual cash has not been paid, but input tax credit has been used instead. This provision is harsh if the taxpayer had ITC to set off a tax liability. ITC credit arises when tax has already been paid to the government and credit is eligible. A simple fact that input purchases by a business are made well before the final products are ready for sale and if the tax on these sales has been accounted for and paid, credit on purchases must be available. Hence, charging interest on the entire amount, including such portion paid by utilizing input tax credit, seemed unreasonable and unfair.

Two months ago, a writ petition was filed in the Telangana High Court, challenging the levy of interest on the gross amount of tax payable. The petitioner appealed against interest being charged on the input tax credit portion of the tax due, as the GST portal does not allow a return to be filed unless the liability due in cash has also been paid off. While experts believed that this rule by the Government is against its objectives and established practices, the Law did not clarify the extent of liability interest should be levied on. Hence, an order was passed validating the interest charged by the tax authorities, and thus dismissing the writ petition. The 31st GST Council meeting recommended changing this Law to provide that only the net liability of a taxpayer would hereafter be subjected to interest. This amendment to the Central Goods and Services Tax Act was presented under the Finance Bill, 2019. Under this new amendment governing section 50 of the Act, interest will now be charged on only that portion of the GST liability which is paid by debiting the electronic cash ledger. In other words, the portion paid using cash, bringing much-desired relief to taxpayers. bringing much-desired relief to taxpayers.

The amendment to section 50 was proposed in the Union Budget on July 5, 2019, and the Finance Bill 2019 was passed in the Lok Sabha on July 18, 2019. For taxpayers who have already paid interest on the full tax liability in the current financial year, including that portion paid using credit, the official notification, once released, will provide clarity on whether they are eligible for a refund.



**SALMAN MOHAMMED**  
Audit Assistant



## The future of mobility starts with Hyperloop

Hyperloop is a high-speed mass transportation concept floated by American entrepreneur and innovator Elon Musk. Hyperloop is the world's most advanced low-pressure high speed completely sustainable tube-based transportation system. To connect people and cities across vast distances at incredible speeds. To truly revolutionize the way, we travel. Hyperloop brings airplane speeds to ground level, safely. Passengers and cargo capsules will hover through a network of low-pressure tubes between cities and transforming travel time from hours to minutes. Passengers and goods will travel in pressurized capsules floating on a frictionless magnetic cushion within the tubes. Capsules are powered by a linear induction motor, electromagnetic propulsion, and embedded rechargeable batteries. As a result, the system is silent and emission-free. Capsules are engineered and designed to create a safe and harmonious environment for the passengers, with the customized interior for use-based experiences. Each capsule is 30 meters in length and can carry 28 to 40 passengers. It can reach a maximum speed of 1,223 km/h. As the capsules move through the low-pressure environment, they use very little energy on route thanks to the reduced drag forces.

### **HYPERLOOP TECHNOLOGY WITHIN INDIA'S TRANSPORT ECOSYSTEM**

The Indian State of Maharashtra announced its intent to build a hyperloop route between Mumbai and Pune, beginning with an operational demonstration track. The full project is proposing to link Central Pune, the Navi Mumbai International Airport and Central Mumbai with a potential commute time of 25 minutes. A study conducted by Virgin Hyperloop One estimated that the Pune-Mumbai route could eventually support 150 million passenger trips each year and over 30 years of operation could result in \$55bn (INR Rs.350,000 crores)-worth of socio-economic benefits via time savings, emissions and accident reduction, and operational cost savings. Devendra Fadnavis, Maharashtra's chief minister, believes the regular inter-city traveler will be able to do and afford this by 2024. By the end of 2018, construction is set to begin on a 15-km test track for the Mumbai-Pune hyperloop. The only working model right now is a test site built by Virgin's Hyperloop One in the Nevada desert, which

Fadnavis has visited. In February, Fadnavis signed an MoU with Richard Branson's Virgin Hyperloop One to build the Mumbai-Pune track. Kaustubh Dhavse, the officer on special duty to Fadnavis, said the chief minister's office is closely monitoring the project. "Work (on the test track) will start by end of this year.

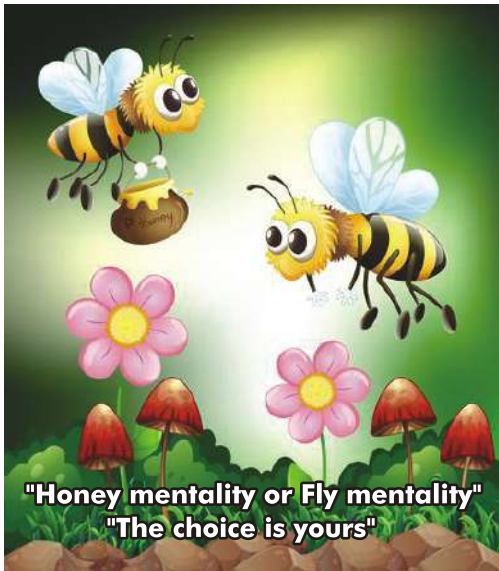
Dhavse says, "It won't take a long time to build because the construction is simple. But we need to build a regulatory framework that cuts across various ministries and is beyond the purview of the state government. The ministry of civil aviation, the railways' ministry all of these need to be involved. "While Dhavse refuses to give cost estimates for the whole project, the demo track 15km stretch proposed near Wakad, Pune, is expected to cost roughly ₹ 3,000 crores. Virgin Hyperloop One's website estimates that the top speed for a passenger vehicle or light cargo will be 670 miles (1,080km) per hour. "That is 2-3 times faster than high-speed rail and magnetic levitation trains, and 10-15 times faster than traditional rail. Dhavse adds, "The cost of this project will evolve but the cost per km will be about the same as the overhead metro, that's about \$15-25 million per km. Dhavse believes the cost of Mumbai-Pune hyperloop commutes would be comparable to road or rail alternatives.

### **'World's First' Commercial Hyperloop Construction to Start in Abu Dhabi in 2019**

The Los-Angeles based research firm HTT is going to make Elon Musk's Hyperloop dream become reality, shortening travel times between emirates from hours to just minutes. Hyperloop Transportation Technologies (HTT), a California-based research company, revealed on Wednesday that it would start the construction of an ultra-fast commercial hyperloop track in Abu-Dhabi in Q3 2019. HTT announced the design and engineering firm Dar Al-Handasah as the lead designer and the latest investor in the Abu Dhabi project. HTT Chairman Bibop Gresta said, "We are bringing the future of rapid transportation technology to all those living in the UAE."



**FAROOQ .S**  
Audit Assistant



## THE SECRET OF SUCCESSFUL RELATIONSHIPS

There is a wonderful analogy about the honeybee and the fly. It teaches us a valuable lesson to improve our relationships and quality of life. The honeybee flies from flower to flower extracting only the nectar without disturbing the flower. The mindset of the honeybee is to seek the essence of each flower. Even in a place fitting filled with rotting garbage rather than giving its attention to all the filth, the honey bee keeps its focus on finding nectar and it eagerly flies to even a single tiny flower amidst miles of garbage. In our relationships we have much to learn from the honeybee; it is teaching us the art of focussing on the positives and dealing appropriately with the faults in each other. There will be faults everywhere and in everyone, there is never a shortage of things to complain about, but honeybee seeks nectar even in the most unexpected of places, we can aim to seek the positive qualities in those around us. The fly represents another type of mindset in a relationship although each species can be appreciated for its particular instinctive nature, still, we can study them to learn relevant lessons to improve the

quality of our own lives. On an otherwise healthy body, the fly will focus on sucking an infectious scab. The fly may travel over hundreds of flowers, but what does it focus on? It focuses on tasting garbage and excrement. It ignores the sweet fragrance of rose gardens and even in the best of circumstances, and in the tidiest places, the fly will focus on the trash. This represents the mindset of ignoring the good qualities in those around us and focusing on their faults. It is so easy, it requires no effort to see the flaws in others. Fault finding is a habit, the more we give in to it, the more we become obsessed with it. In a relationship it is important to have honest, well-wishing communication, focused on appreciating the positive while dealing with the negatives in a gracious, constructive manner. Trying to bring out the best in each other. In doing so we learn to recognize the positive qualities within own self and to overcome unhealthy low self-esteem.



**CMA. PRATHIBA DASS**  
Manager - GST

## SINGAPORE – LAND OF OPPORTUNITIES FOR COMMERCIAL INVESTMENT FOR INDIANS



The Global Tamil Auditors and Institutional Federation along with Tamilnadu and Pondicherry Auditors Association and Tamilnadu Agricultural and Industrial Federation organized an one-day seminar on the topic "Singapore - The Best Commercial Investment Country for Indians". The seminar was conducted at IIT Chennai.

CA. K. Nambi Arooran welcomed the delegates and briefed about the session. CA. Aruloli explained the objects of this seminar and the reason for inviting Sri. CA. Narayana Mohan as the Chief Guest. He further explained about ARAM and importance of it in life and business. ARAM oversees Commercial accounts, auditing, and financial management. Rev. Fr. Jagat Caspar while addressing urged the Tamil Youth must get training and start industries & commercial

establishments in foreign countries like Singapore. He explained in detail the history of Tamilnadu and the legacy of Export and Import intertwined in the culture. CA A. John Moris introduced the chief Guest - Sri. R Narayana Mohan, a renowned Auditor in Singapore. He recollected how the meeting with Shri. R Narayana Mohan in Singapore and his interactions enlightened him of his selfless and dynamic services to the Indian diaspora and Ministries in Singapore.

In his keynote address, CA R Narayana Mohan noted that Industrialists, traders, entrepreneurs from Tamilnadu can easily and effectively start their ventures in Singapore. The Government of Singapore is welcoming foreign investment, especially from India. The tax rates are comparatively less and also it is a peaceful country with diverse culture and tourism driven. He observed that currently there are 8000 Indian Companies operating successfully and earning foreign currency for our nation. He also shared that the banks in Singapore are business friendly and finance can be arranged at no time. And also the regulations regarding immigration are not that stringent. Therefore, he insisted on our professionals to consider Singapore as a favored destination to set up commercial investments. The Secretary of Tamilnadu Small Tiny and cottage Industries Association, Mr. Gnanasekar while appreciating such initiative requested the organizers to organize many more such seminars in all districts and he assured of any assistance through their association. Finally, CA. R. Marimuthu delivered the vote of thanks. The seminar was attended by more than 200 auditors, industrialists, and entrepreneurs. The delegates expressed their contentment by acknowledging that this was a first-of-its-kind seminar organized for the benefit of the Indian professionals and entrepreneurs with such far reaching benefits.



**CA. J. SEBASTIN**  
Partner

# 24<sup>th</sup> YEAR PARTNERS MEET - MARCH 2019



# 24<sup>th</sup> YEAR PARTNERS MEET - MARCH 2019

