



ROHINI

COLLEGE OF ENGINEERING & TECHNOLOGY

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THE FAIRE CONNECTIONS

ELECTROVISION

**DEPARTMENT OF ELECTRONICS AND
COMMUNICATION ENGINEERING**

2019-2020

VOL 1 | 2019 NOVEMBER EDITION

NEWSLETTER

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From Chairman's Desk

Dear All,

"Learning gives creativity, creativity leads to thinking, thinking provides knowledge, knowledge makes you great"

- Dr.A.P.J.Abdul Kalam.



These words by - Dr.A.P.J.Abdul Kalam perfectly describe our aim at Rohini College of Engineering and Technology. Beyond providing a sound education, we wish to provide our students a holistic learning experience for life. Our aim is to teach students to LEARN, not just STUDY. Hence, we strive to travel beyond the boundaries of mere books. We have realized that the future is abstract and unknown but the youth in our hands are real and can be Molded. Engineers play the most vital and important role in nation building. They create new inventions using best engineered technologies to make human life more comfortable, secure and productive. In modern times, nations which have rich engineering and experienced technological domains are flourishing economically and are providing better lives to their people We have excellent potential to grow in diversified areas and excel in Engineering and technological fields. We need enormous number of engineers and managers to write next story of success.

We have identified the needs of modern engineering, technology for modern age students, with a vision and mission accompanying transparency, accountability and accessibility which keeps us abreast. I can proudly say that Rohini College of Engineering and Technology is the most modern and sophisticated multidisciplinary institution, imparting quality education and providing a wide and varied arena for the staff and students to showcase their academic and extracurricular talents. With relentless efforts, the college aspires to orchestrate the students' potential for the enrichment and progress of society by equipping them with technical expertise and soft skills. Our well qualified and experienced Teaching faculties guide the students to hone their talents to excel in this competitive world.

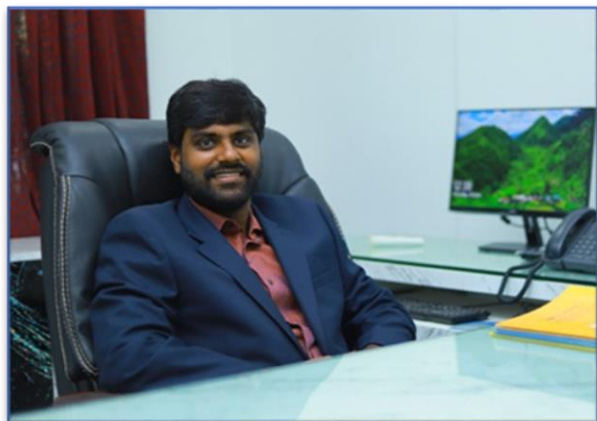
I am proud to say that once our students step in, they step out with self-confidence and knowledge to face all future endeavors with full conviction. Fly in the plane of Ambition, Land in the Airport of Success, The luck is yours the wish is mine. May your future always shine. Good Luck.

Cordially,

Shri.K.NEELA MARTHANDAN
Chairman, Rohini Groups.



Managing Director's Message



Dear All,

Endorsing creativity and stirring innovation are two of the vital elements of a successful education and Newsletter is the perfect amalgamation of both. It harnesses the nifty energies of the academic community and refines the essence of their inspired imagination in the most brilliant way possible.

Hence, I am delighted to know that Newsletter of ECE Department "Electrovision" is ready for publication. I take this opportunity to congratulate the editorial board for bringing out this Newsletter, which in itself is an achievement considering the effort and time required. May all the students soar high in unexplored skies and bring glory to the world and their profession with the wings of education!

Best Wishes,

**Dr.N.NEELA VISHNU, M.B.A.,
Managing Director**

Chief Financial Officer's Message



Dear All,

It is a matter of great pride and satisfaction to bring out the News Letter "Electro Vision" released from the Department of ECE. I am confident that this issue of Department News Letter will send a positive signal to the staff, students and the person who are interested in the Technical education and Technology based activities.

A News Letter is like a mirror which reflects the clear picture of all sorts of activities undertaken by the Department and develops writing skills among students in particular and teaching faculty in general. I congratulate the Editorial Board of this News Letter who have played wonderful role in accomplishing the task in stipulated time. Also my heartfelt Congratulations to staff members and Students for their fruitful effort.

Best Wishes,

**Dr.V.M.BLESSY GEO, M.Sc.,Ph.D.
Chief Financial Officer**





Principal's Message

Dear All,

It gives me great pleasure, as a Principal of this college, to say a few words about Rohini College of Engineering and Technology. Any Institution, if it aims at reaching greater heights, needs to have clearly spelt Vision and Mission. Our college has set its Mission as to impart Quality Education to all the people, thereby developing the nation as a whole. Our long term vision being to achieve greater heights in the field of education by providing an opportunity to each and every individual to choose the right path, realize the value of

education and achieve their goals by adding values through quality education. We give more emphasis to the overall moulding of every student through quality education and In-plant training, right from the initial stage of education. Well-equipped laboratories and work shop with most modern and sophisticated instruments/machineries are provided to impart state-of-the-art education to the students. Ample opportunities are being provided to the students in Personality Development and other extracurricular activities. Well qualified and experienced teaching faculty is provided to impart quality education to the students. The placement cell has a vital role in placing the students in the reputed companies. With all these facilities in place and with the right attitude of the Management. The students who continue education in this esteemed Institution would be greatly benefited in future. Good Luck!

Best Wishes,

Dr.R.RAJESH, M.E., Ph.D.
Principal



HOD's Message

Dear All,

At the outset, I would like to thank the Management and Principal for their continuous support and Guidance, Faculties and students for doing exemplary support and contributions in the department! It gives me immense pleasure to note that the editorial board brings out another edition of newsletter "Electrovsn". It is great to find students as winners and participants in co-curricular and extracurricular activities which certainly prove that our students are adequately equipped and

possess necessary skill-sets to bring such laurels to the Institution and Department. The Department aims academic progression, skill development, inculcating research value, bringing out hidden talent of students as well as faculty members through activities like Guest lectures, Faculty Development Programmes, Research workshops, Technical Symposium, Mini-Project Expo etc., This newsletter is a medium to present the glimpse of such activities and achievements of the department in each semester to all the stakeholders. I am sure that by reading these pages you will get a bird's eye view about activities of ECE Department.

Cordially,

Dr.S.MOHANALAKSHMI, M.E., Ph.D.
Professor & Head / ECE





Mr.P.BENESH SELVA NESAN
Assistant Professor
Department of ECE

Associate Editor's Message

Dear All,

It gives us great pleasure to bring you the first issue of "ElectroVision", the ECE department Newsletter of Rohini College of Engineering and Technology, Kanyakumari. We would like to place on record our gratitude and heartfelt thanks to all those who have contributed to make this effort a success. We profusely thank the management for giving support and encouragement and a free hand in this endeavor. With Best Wishes!



Mr.C.K.MORARJI
Assistant Professor
Department of ECE

Assistant Editor's Message

It gives us great pleasure to bring you the first issue of "ElectroVision", the ECE department Newsletter of Rohini College of Engineering and Technology, Kanyakumari. The name and fame of an institute depends on the caliber and achievements of the students and teachers. The role of a teacher is to be a facilitator in nurturing the skills and talents of students. This newsletter is a platform to exhibit the literary skills and innovative ideas of teachers and students "Electrovision" presents the skills and innovative thinking of students and contributions of teachers.

Cordially,
Ms.C.MAGI SAHULIN
Final Year ECE

Editorial Board

Academic Year	:	2019-2020
Issue	:	IV
Volume	:	01
Editor in Chief	:	Dr.S.Mohanalakshmi, Professor & Head, Department of ECE
Associate Editors	:	Mr.P.Benesh Selva Nesan, Assistant Professor, Department of ECE
		Mr.C.K.Morarji, Assistant Professor, Department of ECE
Assistant Editor	:	Ms.C.Magi Sahulin, Final Year ECE
Editorial Board Members	:	Ms.P.Roselin Southri, Final Year ECE
		Mr.J.Jinu Krishnan, Final Year ECE
		Mr.S.Melben Raj, Final Year ECE



INSTITUTE VISION

- ✚ To be an Academic Institute of Continuous Excellence towards Education and Research in Rural Regime and Provide Service to Nation in terms of Nurturing Potentially Higher Social, Ethical and Engineering Companion Graduands.

- ✚ To Foster and Promote Technically Competent Graduands by Imparting the State of Art Engineering Education in Rural Regime.

- ✚ To Enunciate Research Assisted Scientific Learning by Dissemination of Knowledge towards Science, Agriculture, Industry and National Security.

INSTITUTE MISSION

DEPARTMENT VISION

- ✚ To promote ethical and innovative Electronics and Communication Engineers through excellence in teaching, training and research so as to contribute to the advancement of the rural society and mankind.




- ✚ To impart high quality technical education and exposure to recent trends in the industry, to ensure that the students are moulded with competent qualities of Electronics and Communication Engineering.

- ✚ To inculcate research capabilities and exemplary professional conduct to lead and to use technology in agriculture, industry and national security for the progress of our country.



DEPARTMENT MISSION



PROGRAM EDUCATIONAL OBJECTIVES (PEO's)

-  PEO1: Lead a successful career by applying the Scientific and Engineering fundamentals to formulate and solve the real life problems.
-  PEO2: Practice the ethics of their profession, consistent with a sense of social responsibility and aptitude for innovations as they work individually and in multi-disciplinary teams.
-  PEO3: Be receptive to recent technologies so as to excel in industry and accomplish professional competence through lifelong learning.

PROGRAM SPECIFIC OUTCOMES (PSO's)

-  PSO1: Ability to perform innovatively in the fields of Electronics and communication Engineering by utilizing the acquired knowledge and to progress in the profession by applying ethical values ultimately benefiting the rural society.
-  PSO2: Apply advanced engineering hardware and software tools to solve complex Electronics and Communication Engineering problems.



DEPARTMENT ACTIVITIES



ORIENTATION PROGRAMME 2019

Mentoring is a particular form of relationship designed to provide personal and professional support to an individual. The mentor is generally more experienced than the mentee and makes use of that experience in a facilitative way to support the development of the mentee. The mentoring relationship provides a developmental opportunity for both parties and can thus be of mutual benefit. In a nutshell, a student mentor's role may be perceived to be facilitative, supportive and developmental for the student community in general. The orientation program began on 1st July 2019 with the welcome of second year ECE Students, Faculties of ECE department and chief guest of the event Mr.C.Rose Cyril Xavier who graced the occasion and gave a detailed explanation about the job opportunities in Telecommunication Industry, what the skills industry look from electronic engineers and how they can be a successful electronic engineers in their career. Followed next Dr.S.Mohanalakshmi, HOD/ECE had explained the Vision, Mission and Facilities available in ECE department.

ASSOCIATION INAUGURAL 2019

The ECE Students association **"THE FAIRE CONNECTRONS"** for the academic year 2019-2020 was inaugurated on 12th July 2019 by 3.00 pm at Opulent hall. Dr.S.Mohanalakshmi, Prof&Head of ECE Department welcomed the gathering. Dr.R.Rajesh, Principal gave a Presidential address and highlighted the importance of Association in the department. Ms.P.Divyashri, Student General Secretary of ECE Association delivered the annual report of the academic year 2018-2019. Mr.C.K.Morarji, AP/ECE, Association coordinator introduced the office bearers. Mr.P.Benesh Selva Nesan, AP/ECE, Association coordinator introduced the chief guest. Mr.R.Ramesh, Scientific Officer 'F' (Quality Assurance) of NPCIL, Koodankulam gave the Inaugural address on core industrial needs, expectation from the engineers, insisted the importance of internship, projects paper presentation in moulding the engineers. He insisted the students to take up opportunities inspite of their surroundings and also to strive for their places in this world by their hardwork, sincerity and dedication. He motivated the students to decide their vision, mission and the objectives for constructing their own path and to attain their desired goal.



GUEST LECTURES / SEMINARS



SEMINAR ON “NUCLEAR ENERGY”

Seminar on “Nuclear Energy” was held on by Mr.Ramesh, Nuclear Power Corporation of India, Koodankulam for the third year students on 12.07.2019. Totally 120 students attended and obtain the knowledge on the possibilities of non-electric application and co-generation with nuclear power plants, in particular sea water desalination and district heat production. Also, a more perspective high-temperature application like coal liquefaction and hydrogen production is discussed.

GUEST LECTURE ON “VARIOUS IMAGE PROCESSING TECHNIQUES”

Department of ECE organized a guest lecture program on “Various Image Processing Techniques” on 22.08.2019. The guest lecture was delivered by Dr.C.Seldev Christopher, Professor, St.Xaviers Catholic College of Engineering , Kanyakumari. The motive of this guest lecture is to make the students understand the techniques in the area of image processing in such a way that it would be beneficial to the students for devolving a novel project.



GUEST LECTURE ON “INFLUENCE OF ANALOGY IN PRODUCT DESIGN PROCESS”

Guest Lecture on “Influence of Analogy in Product Design Process” was held on 19.09.2019 by Mr.Jim Seelan, Technical Consultant, Tata Consultancy Service, Trivandrum for the third year students on date. Totally 120 students attended and obtain the knowledge on the mechanics of analogy could be explained by the principles of cognitive psychology, and it does connect with the New Product Development process. An attempt to identify the influence of analogy to the various steps in a typical NPD process. Although all the typical NPD steps are considered, particular stress is on early stages of the NPD process till concept generation.



DEPARTMENT ACTIVITIES



SPECIAL LECTURE ON DIGITAL SIGNAL PROCESSING AND IT'S APPLICATIONS

Special Lecture on Digital Signal Processing was held 04.10.2019. The main motive of this lecture is to equip the students to get a complete idea on fundamental concepts and applications of digital signal processing. Totally 120 students attended and obtain the knowledge on Digital Signal Processing. This special lecture was delivered by Dr.Jaffino, Assistant Professor, Aditya College of Engineering, Andhara Pradesh.

GUEST LECTURE ON LARGE SIGNAL AMPLIFIER

Guest Lecture on Large Signal Amplifier was held on 04.09.2019. The guest lecture was delivered by Dr.T.Jayasree, Assistant Professor, Government College of Engineering, Tirunelveli. The main motive of this guest lecture is to make the students understand the principle and operation behind the large signal amplifier and it's various applications. Totally 120 students attended and obtain the knowledge on analog circuits.



GUEST LECTURE ON DIGITAL COMMUNICATION

Department of ECE organized a Guest Lecture on Digital communication was held on 22.08.2019. The aim of this guest lecture is to know about the digital communication techniques and also about the contemporary research on this field. Mr.Sri Ram, Assistant Professor, SRM University, Chennai was the Chief guest.

GUEST LECTURE ON EMBEDDED AND REAL TIME SYSTEMS

Department of ECE organized a Guest Lecture on Embedded and Real Time Systems was held on 28.09.2019. The main motive of this lecture is to get a complete Idea on fundamental concepts and real time applications of embedded systems. This session was delivered by Mr.Abishek Venkadesh, Technical Head, Ekaad Technologies , Nagercoil.



STUDENTS ACHIEVEMENTS

- ✚ Student Nandhini.S.C has participated in the National Level Technical Symposium “SANDEZA 2K19” and won first prize in Paper Presentation at Loyola Institute of Technology & Science, Kanyakumari on 27.8.2019.
- ✚ Student Vinesh.V has participated in the National Level Technical Symposium “SANDEZA 2K19” and won first prize in Quiz Competition at Loyola Institute of Technology & Science, Kanyakumari on 27.8.2019.
- ✚ Student Thangaraj.J has participated in the National Level Technical Symposium “SANDEZA 2K19” and won first prize in Quiz Competition at Loyola Institute of Technology & Science, Kanyakumari on 27.8.2019..
- ✚ Student Adlin Mahiba.B has participated in the National Level Technical Symposium “SANDEZA 2K19” and won second prize in Paper Presentation at Loyola Institute of Technology & Science, Kanyakumari on 27.8.2019.
- ✚ Student Aziha.M has participated in the National Level Technical Symposium “SANDEZA 2K19” and won second prize in Paper Presentation at Loyola Institute of Technology & Science, Kanyakumari on 27.8.2019.
- ✚ Student Bernisha.V has participated in the National Level Technical Symposium “SANDEZA 2K19” and won second prize in Paper Presentation at Loyola Institute of Technology & Science, Kanyakumari on 27.8.2019.
- ✚ Student Harish Kumar.V has participated in the National Level Technical Symposium “SANDEZA 2K19” and won second prize in Paper Presentation at Loyola Institute of Technology & Science, Kanyakumari on 27.8.2019.



INVITED ARTICLES

SOFTWARE DEFINED NETWORKING

The internet is a medium used for loads of data transfer. Traditional internet protocol (IP) networks used in the internet have evolved over years and are deployed for a quite long period of time. This has led to hard and rigid networks which are not easily reconfigurable nor easily manageable. Reconfiguration requires that the network responds to faults, loads and changes which does not happen in the internet or IP network. This is due to the fact that IP networks are built from large number of devices like routers, switches etc. Any change required for these devices according to change in the network condition has to be manually performed by the network operator often with a limited set of tools. Due to these, network management and performance tuning are complicated tasks to be executed by network managers and often lead to errors. Apart from these disadvantages of the IP network, another source of rigidity is that network devices are vertically integrated i.e. the control and data planes are together and there is no separation in the control and data planes.

Taking into account all these drawbacks of the current IP-networks, software defined networks (SDN) were proposed in [1]. The salient point in SDN is the separation of control and data planes which breaks the vertical integration and thus separating the network's control logic from underlying routers and switches. This also imparts the ability to program and control the network. SDN essentially breaks the network control problem into manageable pieces. In this article, SDN is looked at in details. The control plane of the network consists of the network's logic and data plane consists of switches which forward the data traffic. With this separation of control and data plane, the network switches become simple forwarding devices with control logic implemented in a centralized controller.

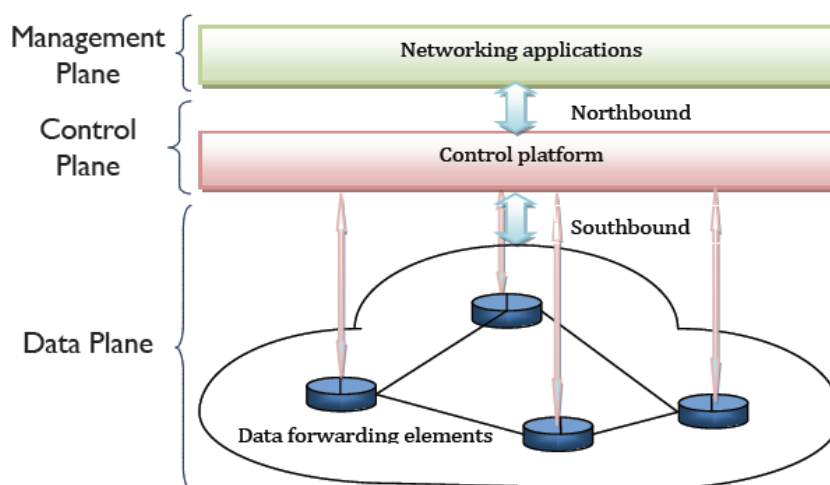


Figure 1: Conceptual architecture of SDN



STUDY CORNER

A simple view of this architecture is shown in Fig.1.

- (i) Control and data plane are decoupled and control functionality is removed from network devices.
- (ii) Forwarding decisions are flow based and not decided by the destination, where flow is a sequence of packets from source to destination.
- (iii) Control logic is moved to an external entity which is called SDN controller or network operating systems (NOSs) which has the same purpose as an operating system.
- (iv) Software applications running on top of NOS program the network. Various terminologies used in SDN networking are as follows:
 - a) Forwarding device (FD): These are hardware / software based data plane devices used to take action on incoming packets.
 - b) Data plane (DP): Forwarding devices are interconnected using wired/wireless channels which are called data plane.
 - c) Southbound interface (SI): This defines a communication protocol between data plane and control plane elements.
 - d) Control plane (CP): This is network brain and consists of entire controller logic.
 - e) Northbound interface (NI): Common interface for developing applications.
 - f) Management plane: set of applications that leverage functions offered by NI.

--- Ms.R.RAMA SELITHA, IV Year ECE (B)

SECURE ELECTRONIC TRANSACTION

Recent advancement in wireless communications and electronics has enabled a variety of applications and modern computing systems. With internet, most of the computers in the world today are interconnected. Even though we enjoy lot of benefits due to this interconnectivity, it has also created new risks for the users due to threat from hackers and attackers. To achieve a secure system, security must be integrated into every component, since any component designed without security can become a point of attack. Consequently, security and privacy pervade every aspect of system design. If adversaries exist, they can perpetrate a wide variety of attacks in the system. Confidentiality, Integrity and Authentication are the basic security services required to achieve a secure system. Secure Electronic Transactions, one of the network security applications, is discussed in this article to understand these security services as most of us do credit card transactions nowadays.



STUDY CORNER

Secure Electronic Transaction (SET) was a wonderful communication protocol standard for securing credit card transactions over insecure networks. Secure Electronic Transaction was developed by SET consortium, established in 1996 by VISA and MasterCard. Unlike a payment system, SET is a set of security protocols that enables secure transactions over the internet. Like any other security protocol, to meet the requirements SET provides services like Confidentiality, Integrity and Authentication. SET basically provides a secure communication channel between the customer and the merchant involved in the transaction, provides trust by X.509 digital certificates. The important point to be noted here is that a customer's credit card information is exchanged between the customer and the credit card authenticator, with a purchase authorization sent to the merchant that prevents the merchant from knowing the customer's credit card information. Sequence of steps required for a SET Transaction:

- ✚ First the customer obtains a credit card account with a bank that supports electronic payment and SET
- ✚ The customer then receives X.509 digital certificate signed by the bank
- ✚ Merchants will be having their own certificates
- ✚ The customer initiates order
- ✚ The merchant sends the customer his public key and a copy of his certificate so that the customer can verify that it's a valid store.

Now the customer has to place an order with the merchant. Here the customer wants to send the Order Information (OI) to the merchant and the Payment Information (PI) to the bank. There is no need for the merchant to know about the customer's PI and the bank does not need to know about customer's OI. There must be some provision for the customer to keep these two items separate but linked in a way that can be used to resolve conflicts if any. For example the link is needed for the customer to prove that this payment is for this particular order and not for some other services. Such a provision is possible with Dual Signature. Customer links OI and PI by constructing a Dual Signature. The steps involved in constructing the Dual Signature are:

- ✚ The customer takes the hash of PI and OI by using Secure Hash Algorithm (SHA 1)
- ✚ The resulting PI Message Digest (PIMD) and OI Message Digest (OIMD) are concatenated and the hash of the result gives Payment Order Message Digest (POMD)
- ✚ POMD is encrypted with customer's private signature PRc key resulting in dual signature
- ✚ Customer sends Purchase Request message which includes Purchase related information, Order related information and the customer's certificate



STUDY CORNER

- ✚ Purchase related information consists of PI, Dual Signature and OIMD (needed for the payment gateway to verify Dual Signature) which is encrypted with a Temporary symmetric key Ks which will be passed on by the merchant to payment gateway along with the Digital envelope (Ks encrypted with bank's public key PUb)
- ✚ Order related information needed by the merchant consists of OI, Dual Signature and PIMD (needed for the merchant to verify Dual Signature)
- ✚ Customer's certificate contains his public signature key which is need by merchant as well as payment gateway

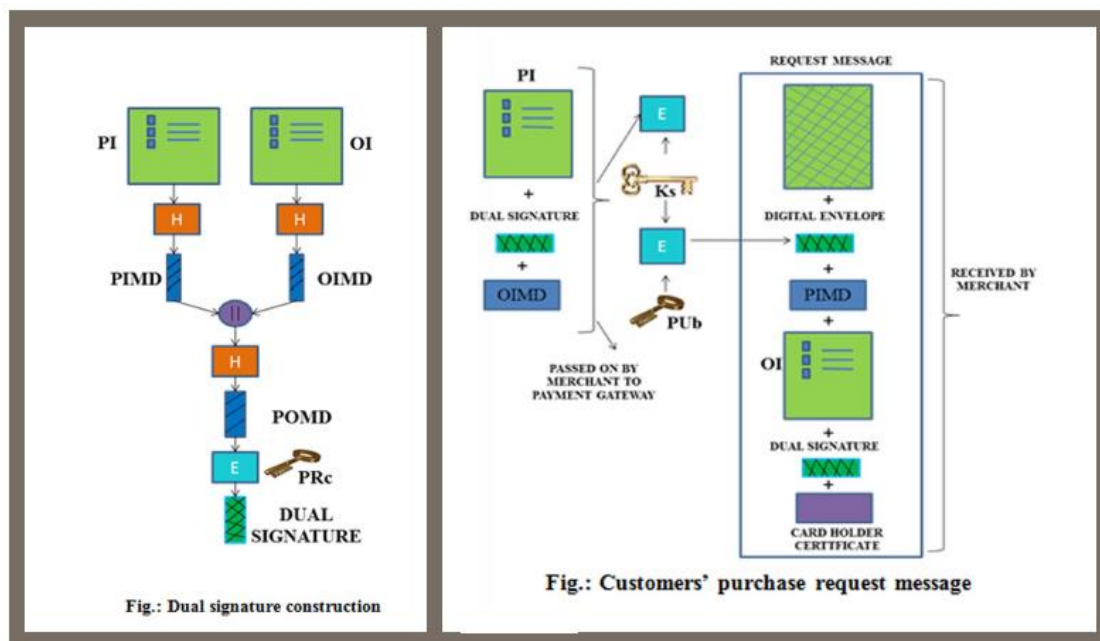
The customer sends the merchant:

- ✚ His certificate.
- ✚ His order details, unencrypted.
- ✚ His bank account details encrypted with the bank's public key.
- ✚ Upon receiving the Purchase request message from the customer, the merchant
- ✚ Verifies the customer's certificate by means of its CA signatures
- ✚ Verifies the Dual Signature using customer's public signature key which ensures that the order is not tampered in transit
- ✚ The merchant requests payment authorization by sending the bank, the authorization request message and The authorization request message consists of (Note that the merchant doesn't know the client's payment and bank account details)
- ✚ Purchase related information (The portion of the Purchase request message passed on by the merchant to the payment gateway)
- ✚ Authorization related information generated by the merchant that includes the transaction ID signed with merchant's private signature key and encrypted with a temporary symmetric key generated by the merchant and a digital envelope
- ✚ Certificates like customer's signature key certificates that is used to verify the Dual Signature, the merchant's signature key certificate that is used to verify the merchant's signature and the merchant's key exchange certificate that is needed in the payment gateway's response
- ✚ Upon receiving an authorization request message from the merchant, the payment gateway
- ✚ Verifies all certificates and Decrypts the authorization block and verifies the merchant's signature



STUDY CORNER

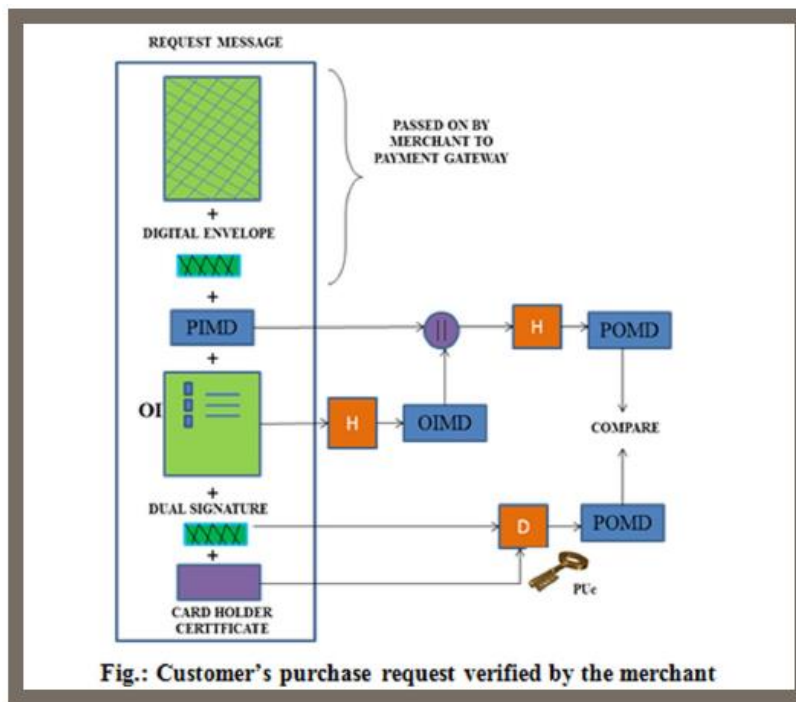
- ✚ Decrypts the payment block and verifies the Dual Signature
- ✚ Verifies that the transaction ID from the merchant matches with that in the PI received indirectly from the customer
- ✚ More importantly verifies the customer's available credit is sufficient for this purchase
- ✚ The bank sends the merchant a confirmation encrypted with the merchant's public key, the authorization response
- ✚ The merchant confirms the order
- ✚ The merchant ships the goods to the customer.
- ✚ The merchant sends the bank a transaction request encrypted with the bank's public key.
- ✚ The bank transfers the payment to the merchant.



Note: The Dual Signature constructed by the customer is sent to both the merchant and the bank. The protocol is designed in such a way that the merchant sees the MD of the PI without seeing the PI itself, and the bank sees the MD of the OI but not the OI itself. The dual signature can be verified using the MD of the OI or PI. It doesn't require the OI or PI itself. At the same time PIMD and OIMD does not reveal the content of the OI or PI, and thus privacy is preserved.



STUDY CORNER



SET was intended to become the de facto standard for secure transactions over the internet between the merchants, the customers, and the credit card companies. Despite heavy publicity it failed to gain widespread use due to simplicity of the existing Secure Sockets Layer (SSL) based alternative. Having discussed about SET, we can now look into how we can provide solutions in terms of security services and mechanisms for the upcoming applications. Internet between the merchants, the customers, and the credit card companies. Despite heavy publicity it failed to gain widespread use due to simplicity of the existing Secure Sockets Layer (SSL) based alternative. Having discussed about SET, we can now look into how we can provide solutions in terms of security services and mechanisms for the upcoming applications.

--- Ms.C.ISHA, III Year ECE (A)

