



EDITORIAL BOARD:

Dr D.Srinivasula Reddy
HOD of ECE,
D.Srilatha
Associate Professor,
B.Gopi Chandra Kumar
Associate Professor.

Students :

1. E Sowmya
III ECE
2. P Tharun
III ECE
3. A Divya
III ECE
4. E Bhavani
III ECE
5. C Sruthi
III ECE
6. P.Sathish
III ECE

INSIDE THIS

Thyristor Based Intelligent Motor Controller	1
Zigbee	3
Indian Engineering Services(IES)	4
Surface Conduction Electron emitter Display(SED)	6
IPTV: The Future TV	7
Green Cloud	8

RISE-MAGAZINE

Recent Innovations In Sophisticated Electronics

VOLUME 10

JAN-JUN 2017

Thyristor based intelligent motor controller

NN Power Planner is a micro-controller controlled thyristor based intelligent Motor Controller which provides a simple, effective, reliable & economical solution to the problems of an ac Induction Motor by constantly monitoring the efficiency of the motor by utilizing powerful microcomputer & ensuring that the input power to the motor is matched exactly to the load as it changes. Even the slightest variation in the demand is sensed & NN Power Planner will respond by supplying full power to the motor if required in 100th of a second. This controlled release of power to the motor provides smooth & step less acceleration & deceleration, also enabling more frequent starting & stopping.

A soft start & soft stop facility incorporated in all NN Power Planner. 3 phase units ensure about 300 starts per day. Further, by eliminating high in-rush current on start up, maximum demand is also considerably reduced. NN Power Planner has unrivalled ability to change the shape of the applied voltage waveform thus reducing the impact of standing losses existing in all AC induction Motors.

Once the motor has reached its full speed, the NN Power Plan-

ner optimizing mode will search for the minimum power required ensuring the maximum continuous rating of the motor is matched exactly to the load it varies. Thus improving power factor & ensuring minimum running cost. In short NN Power Planner gives the motor an exact amount of

the current through the device falls to zero at the end of each half cycle in the AC supply, is called self communication.

By controlling the switch-on point relative to the voltage zero crossing in each half cycle of the supply, it is possible to regulate the current flowing

through the thyristor. The closer the turn on point is to the end of the cycle the smaller the value of current that will be allowed to flow. Conversely, the closer the turn-on point is to the beginning of the cycle the higher the value of current will be. Using this principle and by connect-



power it needs to do the required job of work at any instant, no more no less.

HOW NN POWER PLANNER WORKS

In common with all soft start devices NN POWER PLANNER uses Thyristors to accurately control the voltage applied at the motor terminals. A characteristic of the Thyristor to switch rapidly from "OFF" to "ON" when pulsed, and to remain "ON" until

ing two Thyristor in anti-parallel to each of the phase connections to a motor NN Power Planner continuously adjusts the voltage to the motor terminals by precisely controlling the Thyristor turn-

Due to the motor torque being proportional to the square of the applied voltage, the starting torque increases in a step less manner ensuring a soft start for both the motor and the driven load.

ENERGY SAVINGS

When working at or near full load, the typical 3-phase induction motor is relatively efficient, achieving efficiencies of between 80% to 92%. Motor speeds cannot be varied the op-



timization software in the NN Power Planner will produce energy savings in lightly loaded motors. By detecting the load at any instant, and adjusting the motor terminal voltage accordingly, it is possible to save some of the excitation energy and load loss, and improve motor Power Factor when the motor is

running Inefficiently at light loads.

ENERGY OPTIMIZATION

NN Power Planner has better and advanced programmed Microcontroller which always tries to deliver exact, matching amount of power to motor in 1/100th second, so that Mot or uninterruptly drives the given load with less POWER. NN Power Planner Guarantees ENERGY SAVING up to 9-10% on MOTORS running partly or on VARIABLE LOAD. It has also got the feature of dynamic backstop voltage control, which can be fine tuned from 67% LV to 100%

IN SUMMARY IT MEANS

THAT NN POWER PLANNER WILL

- Reduces the amount of Current consumed by the motor to do its



- job of work.
- Reduces the high starting and inrush current while starting.
- Increases motor life by 50% to 70%.
- By reducing maintenance costs and equipment down time improves motor and plant reliability.
- It is suitable for a very wide range of applications.
- Even to high efficiency motor, it not only provide superb control over the starting and stopping of the motor, furthermore it gives an additional saving in overall energy consumption by its dynamic control.
- Its prices are extremely attractive and competitive.

This device is currently in use and marketed by NN PROJECT LIMITED, a firm based in Gurgaon, Haryana.

Loss of voltage protection

Starters using magnetic contactors

usually derive the power supply for the contactor coil from the same source as the motor supply. An auxiliary contact from the contactor is used to maintain the contactor coil energized after the start command for

the motor has been released. If a momentary loss of supply voltage occurs, the contactor will open and not close again until a new start command is given. this prevents restarting of the motor after a power failure.

This connection also provides a small degree of protection against low power supply voltage and

loss of a phase. However since contactor coils will hold the circuit closed with as little as 80% of normal voltage applied to the coil, this is not a primary means of protecting motors from low voltage operation.

Servo controllers are a wide category of motor control. Common features are:precise closed loop position control Fast acceleration rates.

Design by

P.Sathish

Zigbee

A Zigbee standard has evolved standardized sets of solution called layers. These layers facilitate the features that make Zigbee very attractive, low cost easy implementation, reliable data transfer, short range operation, very low power consumption and adequate security features.

Zigbee is one of the newest technologies enabling wireless personal area network (WPAN). It is a wireless technology developed as an open global standard to address the unique needs of low cost, low power wireless M2M network. The Zigbee protocol has been ratified by member companies of the Zigbee alliance. It is designed to provide an easy to use wireless data solution characterized by secured, reliable wireless network architecture.

The name of the brand was originated with reference to the behavior of honey bees after their return to the beehive. Specified maximum range of operation for zigbee devices is 76 meters substantially further than that by used Bluetooth capable devices. A Zigbee protocol is designed to communicate through hostile RF environments that are common in commercial and industrial applications. Zigbee protocols features include;

- Support for multiple network topologies such as point to point, point to multipoint and mesh network.
- Low latency.
- Low duty cycle-provide long battery life.
- Direct spread spectrum.
- Collision avoidance.

In Industry, Zigbee is being used for next generation automated manufac-



turing with small transmitters in every device on the floor, allowing for communication between devices to a central computer.

It provides the ability to run for years on inexpensive batteries for a host of monitoring and control applications. Automatic meter reading, lighting control, medical devices, fleet applications are just some of the many spaces where Zigbee technology is making significant advancements.

APPLICATION PROFILE

The current list of application profiles either published, or in development are:

RELEASED SPECIFICATIONS

- ZigBee Home Automation 1.2
- Smart Energies 1.1b
- Telecommunication Services 1.0
- Health Care 1.0

RADIO HARDWARE

The radio design used by ZigBee has been carefully optimized for low cost

in large scale production. It has few analog stages and uses digital circuits wherever possible.

Though the radios themselves are inexpensive, the ZigBee Qualification Process involves a full validation of the requirements of the physical layer. All radios derived from the same validated semiconductor mask set would enjoy the same RF characteristics

ZigBee radios have very tight constraints on power and bandwidth. Thus, radios are tested with guidance given by Clause 6 of the 802.15.4-2006 Standard. Most vendors plan to integrate the radio and microcontroller onto a single chip getting smaller devices.

**Design by
E Sowmya**

Indian Engineering Services (IES)

Indian Engineering Services (IES) constitutes of engineers that work under the government of India to manage a large segment of public sector economy which constitutes of Railroads, Public works, Power, Telecommunications, etc. A combined competitive examination is conducted by the Union Public Services Commission (UPSC) for recruitment to the Indian Engineering Services. The examination constitutes of a written examination followed by an interview for personality test. The recruitment of qualified candidate are made under the following categories:

ELECTRONICS AND COMMUNICATION ENGINEERING

The service offers to electronics and communication engineeriners

- Indian Railway Service of Signal Engineers.
- Indian Railway Stores Service.
- (Indian Ordinance Factories Service.
- Indian Naval Armament Service.
- Assistant Executive Engineer (in Ministry of Defense).
- Engineer in Wireless Planning and Coordination Wing/ Monitoring Organization.
- Assistant Naval Stores officer (in Indian Navy).
- Survey of India Service.

(I) ELIGIBILITY CONDITIONS

(i) Age limits:

21-30 years as on 1.8.2011(FOR 2011 EXAM). (Upper age limit relaxable

for SCs/Sts, OBCs and certain other categories as specified in the Notice).

(II) EDUCATIONAL QUALIFICATIONS:

Degree in Engineering or equivalent in any discipline, M.Sc Degree or its equivalent with Wireless Communication, Electronics, Radio Physics or Radio Engineering as a special subject also acceptable for certain posts. (See Notice in the Employment News) .

HOW TO APPLY

Application form:

1. The application form is common for all their examinations which will be processed on computerized machines.
2. The application packet contains, the Application form, information brochure, an acknowledgment card, and an envelope for sending the Application.
3. The Application is available at designated Head Post Offices/ Post Offices throughout the country. The form should be purchased from the designated Post Offices only.
4. This form can be used only once and for only one examination.
5. A photocopy/reproduction/ unauthorised printed copy of the form is not allowed.
6. Acknowledgment cards with a postage stamp of Rs. 6/- should accompany the application form.
7. The name of examination, should be written on the envelope. The application packet will contain the detailed instruction for

filling the application form.

EXAMINATION PATTERN

The entrance for Indian Engineering Service comprises of a **Written Exam** (Section I and II) and an **interview**. The details follow:

- One Engineering Discipline should be chosen from the following categories:
- Civil Engineering
- Mechanical Engineering
- Electrical Engineering
- Electronics and communication Engineering
- The written examination will comprise two sections:
- Section I - objective types questions
- Section II – conventional (essay) type question papers.
- Both Sections will cover the entire syllabus of the relevant engineering subject.

INTERVIEW

Interview for Personality test of selected candidates: 200 mark.

GENERAL (BUT IMPORTANT) INSTRUCTIONS

- All Question Papers must be Answered in English. Question Papers will be set in English only.

themselves. They will not be allowed a scribe to write the answer for them under “any circumstances”.

- Points (upto 5%) may be deducted from the total points of a candidate if his/her handwriting is not easily legible.
- Put in a serious and sincere effort.

Written Examination

Category	Section	Subject	Duration	Max Marks
Civil / Mechanical / Electrical / Electronic and Telecommunication Engineering	Section I – Objective Paper	General Ability Test:	2 hours	200
		Part A – General English		
		Part B – General Studies		
	Section II – Conventional Paper	Paper I	2 hours	200
		Paper II	2 hours	200
		Paper I	3 hours	200
	Paper II	3 hours	200	
Total				1000

Candidates must write the papers themselves. They will not be allowed a scribe to write the answer for them under “any circumstances”.

- Points (upto 5%) may be deducted from the total points of a candidate if his/her handwriting is not easily legible.
- Put in a serious and sincere effort.
- Marks are not allotted for mere superficial knowledge. Orderly, effective and exact expression combined with due economy of words will be rewarded
- SI units will be used in the papers and Candidates should use only International form of Indian numerals (i.e. 1,2,3,4,5,6 etc.) while answering question papers.

The Commission have discretion to fix qualifying marks in any or all the subjects of the examination. The Objective Type papers will be evaluated first and evaluation of the Conventional type papers is done only for those candidates who obtain the minimum qualifying marks in Objective types papers, as fixed by the Set the timing for every section- 'time is a big key'.

- Solve confidentially.
- Prefer best books.
- Prefer short, confident techniques for saving time.
- Prepare for interview.

PERSONALITY TEST

This is the final stage; candidates who qualify the written exam are called for the interview. Interview carries 200 marks. Officially called "Personality Test", the object of the interview is to assess the personal suitability of the candidate for a career in public service by a Board of competent and unbiased observers.

The test is intended to judge the mental caliber of a candidate. In broad terms this is really an assessment of not only his intellectual qualities but also social traits and his interest in current affairs. Some of the qualities to be judged are mental alertness, critical powers of assimilation, clear and logical exposition, balance of judgment, variety and depth of interest, ability for social cohesion and leadership, intellectual and moral integrity.

The technique of the interview is not that of a strict cross-examination but of a natural, though directed and purposive conversation which is intended to reveal the mental qualities of the candidate.

The interview test is not intended to be a test either of the specialized or general knowledge of the candidates which has been already tested through their written papers. Candidates are expected to have taken an intelligent interest not only in their special subjects of academic study but also in the events which are happening around them both within and outside their own state or country as well as in modern currents of thought and in new discoveries which should rouse the curiosity of well educated youth.

The interview test is not intended to be a test either of the specialized or general knowledge of the candidates which has been already tested through their written papers.

These four stages ensure that the candidates selected, are best suited to handle the responsibilities which will be entrusted to them. The selected candidates then undergo training at the academies / institutes of their respective cadres that makes them acquainted with the area of work, the cadre / service is engaged in.

SUGGESTED BOOKS

1. Electronics Devices and Circuit & Analog Electronics
 - Microelectronic circuit SEDRA & SMITH.
 - Solid State Electronic Devices– STREETMAN & BANERJEE.
2. Communication System
 - Mordern Digital & Analog Communication – B.P.LATHI.
 - Electronic Communication System – KANNEDYAND DEVIS.
3. Signal & System – OPPENHEIN & WILLSKY.
4. Control System – B.S.MANKKE.
5. Electromagnetic Theory
 - Elements of Electromagnetic – SADIKU.
 - Antenna & Wave Propagation – K.D.PRASAD.
6. Digital Electronics
 - Digital Design – M.MORRIS MANO.
 - Mordern Digital Electronic – R.P.JAIN.

SUGGESTED WEBSITES

- www.upsc.com
- www.onestopgate.com

**Design by
P Tharun**

Surface-conduction electron-emitter display (SED)

A surface-conduction electron emitter display (SED) is a flat panel color television technology currently being developed by a number of companies. SED use nanoscopic scale electron emitters to energize colored phosphors and produce an image.

In a general sense, a SED consists of a matrix of tiny cathode ray tubes, each "tube" forming a single sub-pixel on the screen, grouped in threes to form red-green-blue (RGB) pixels. SED combine the advantages of CRTs, namely their high contrast ratios, wide viewing angles and very fast response times, with the packaging advantages of LCD and other flat panel displays. They also use much

(OLET), Laser phosphor display (LPD), less power than an LCD television of the same size. After considerable time and effort in the early and mid-2000s, SED efforts started winding down in 2009 as LCD became the dominant technology. SED are closely related to another developing display technology, the field emission display, or FED, differing primarily in the details of the electron emitters.

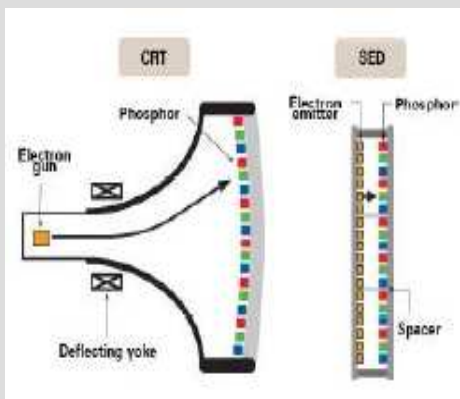


Canon's 36" prototype SED, shown at the 2006 CES

Sony, the main backer of FED, has similarly backed off from their development efforts.

WORKING

A conventional cathode ray tube (CRT) is powered by an electron gun, essentially an open-ended vacuum tube. At one end of the gun electrons are produced by "boiling" them off a metal filament, which requires relatively high current. The electrons are then accelerated and focused into a fast-moving beam, flowing forward towards the screen. Electromagnets surrounding the gun end of the tube



are used to steer the beam as it travels forward, allowing the beam to be scanned across the screen to produce a 2D display. When the fast-moving electrons strike phosphor on the back of the screen, light is produced. Color images are produced by painting the screen with spots or stripes of three colored phosphors, one each for red, green and blue (RGB). When viewed from a distance, the spots, known as "sub-pixels", blend together in the eye to produce a single colored spot known as a pixel.

COMPARISON

Liquid crystal display television The primary large-screen television technology being deployed in the 2000's is the liquid crystal display televisions. SED aimed at the same market segment. LCD does not directly pro-

duce light, and have to be back-lit using cold cathode fluorescent lamps (CCFL) or high-power LED. The SED produces light directly on its front surface.

Scenes are lit only on those pixels that require it, and only to the amount of brightness they required. Canon's 55" prototype SED offered bright images of 450 cd/m², 50,000:1 contrast ratios, and a response time of less than 1 ms. Canon has stated that production versions would improve the response time to 0.2 ms and 100,000:1 contrast ratios.

Current generation Electroluminescent display (ELD), Vacuum fluorescent display (VFD), Light emitting diode display, Cathode ray tube (CRT), Liquid crystal display (LCD), Plasma display panel (PDP), Digital light processing (DLP), Liquid crystal on silicon (LCoS).

Next generation Organic light-emitting diode (OLED), Surface-conduction electron-emitter display (SED), Field emission display (FED), Laser TV (Quantum dot laser, Liquid crystal laser), Ferro liquid display (FLD), Interferometric modulator display (iMoD), Thick-film dielectric electroluminescent (TDEL), Quantum dot display (QD-LED), Time-multiplexed optical shutter (TMOS), Telescopic pixel display (TPD),

IPTV: The future TV

PTV (Internet protocol Television) is a new technology based on internet protocol, offering end-users total control and high entertainment value, is the need of the changing technological scenario. IPTV to a large extent, fits the bill, as it comprises a host of application centered on IP, user choice and rich content. IPTV services may be classified into three main groups: live television, time-shifted programming, and video on demand (VOD). It is distinguished from general Internet-based or web based multimedia services by its on-going standardization process (e.g., European Telecommunications Standards Institute) and preferential deployment scenarios in subscriber-based telecommunications networks with high speed access channels into end-user premises via set-top boxes or other customer premises equipment. Over the last decades, the HDTV have all left their marks on TV scenario, but none were considered adequate enough to fit the bill of the usage. IPTV delivers programming to households via a broadband connection, using Internet protocols. IPTV is clubbed with other services like video-on-demand (VOD), voice-over IP (VOIP) or digital phone and Web access, collectively referred to as triple play. Triple play implies high-speed internet and television/telephone service over a single broadband connection. With wireless, it is called quadruple play and grouped services are called multi-play.

A value added application with high average revenue per user seemed to be the necessity of the hour, and it was essential for this new application to be based on internet protocol (IP) to give the end-user full control and high entertainment value. IP Television, to a large extent fits the bill for this kind of application as it represents a host of applications centered on IP, user choice and rich content.

DIFFERENCE BETWEEN IPTV AND INTERNET TV

There is a very small difference between IPTV and Internet TV. IPTV refers to a closed and proprietary TV system. The content of IPTV is sent over secure IP channels, which can be controlled. Whereas Internet TV is an open and evolving framework, to which small and medium-sized video producers contribute. It is an open setup and anyone having an internet connection can access the data.

IPTV COMPONENTS

Video encoders: Video encoders transform an input stream that can be of various formats into a digital compressed

stream.

Video server: Video servers are computer-based devices linked to large storage systems. Video content, previously encoded, is stored either on disk or in large banks of RAM. Video servers stream video and content.

Middleware: Middleware is the software and hardware infrastructure that conjoins the components of an IPTV solution. It is distributed operating system that runs both on servers at the Telco's location and STBs.

STB/terminal: The STB is a CPE that facilitates interface with the user, the television and the network. For live TV and VOD, the STB supports an EPG that



allows customers to navigate through the programming. The STB transforms a jumbled digital compressed signal into one that can be sent to the TV. The STB hosts the middleware and is the centre of the communications infrastructure within a home.

HOW DOES IT FUNCTION

It is different from conventional analogue TV, IPTV runs through a telephone line and a STB. It is a real time-interactive medium by which a user request can be processed in real time. This feature allows users to watch different programmes depending on their choice and time availability. IPTV is also a multicast and unicast platform, through which viewers can choose from hundreds of channels.

They can also demand for channels of their choice in IPTV, whereas cable TV and satellite TV are only broadcast modes, wherein viewers can see only what is being broadcast. This distinct differentiation makes IPTV unique and desirable. However, with IPTV, one question comes up frequently: Where does the STB receive its picture from? "Most video content enters the system at

the telco's national head-end, where network feeds are pulled from satellites and encoded if necessary.

The video stream is broken up into IP packets and put into the telco's core network, which is a massive IP network, that handles all sorts of traffic (data, voice, etc), in addition to the video". The video streams are received by local office, where local content (such as TV stations, advertising and VOD) is appended to the mix. It is also the spot where the IPTV middleware is housed. It switches channels by using the IP group membership protocol v2 to join a new multicast group. When the local office receives this request, it checks to make sure that the user is authorised to view the new channel, directs the routers in the local office to add the particular user to the channel's distribution index. In this way, only signals that are currently being watched are actually being sent from the local office to the digital subscriber line access multiplexer (DSLAM) and finally, to the user".

IPTV VS DTH, CABLE TV

Although it is not appropriate to compare IPTV with other modes of broadcast, but there lies a difference that is "The entry cost of IPTV service is at par with cable TV but DTH and other cable TV require much more bandwidth (8 Mbps per home, per connection), whereas IPTV can be viewed at 2-3 Mbps."

ADVANTAGES OF IPTV

IPTV is a truly interactive service and can provide numerous services like e-commerce, e-governance, e-education, e-medicine, weather and entertainment. However, its penetration is heavily dependent on good quality, high bandwidth and broadband connectivity. IPTV is still in its nascent phase in India. Considering the current scenario, IPTV can be said to have both pros and cons.

Design by

A Divya

Green Cloud

Green Cloud Technologies is the one who can help you take your business to the Cloud – confidently, painlessly, and successfully. You are here. The Cloud is there. Green Cloud bridges the gap.

With our VMware-based Virtual Server solution, your business has a secure, monitored, reliable, controlled, Cloud-based environment for your critical data and applications. No more old servers on shelves in a dusty closet or crammed in the corner of your office. Gone are the days of paying someone by the hour to look after the hardware or spending more and more money on upgrades and new equipment. You won't have to worry about what happens if there is major snowstorm that knocks out power or a crisis that results in lost data or damaged equipment.

After evaluating your needs and determining the appropriate amount of storage, memory, and processing power you need, we will back up your data, migrate it to our servers, and manage and maintain the environment – 24x7, 365 days a year.

Take advantage of our comprehensive Virtual Server solution or simply work with Green Cloud for your disaster recovery / business continuity needs by using our infrastructure as an off-site back-up for your critical data, ensuring your data – and the ability to continue doing business – is safe in the event of the unexpected.

Green Cloud also helps you obtain feature-rich phone solutions via the Cloud. With our BroadSoft-based Virtual PBX, customers no longer have to purchase expensive, complex phone systems and learn how to use and manage them. Instead, you simply buy it as a service via the Internet.

Green cloud is a buzzword that refers to the potential environmental benefits that information technology (IT) services delivered over the Internet can offer society. The term combines the words green -- meaning environmentally friendly -- and cloud, the traditional symbol for the Internet and the shortened name for a type of service delivery model known as cloud computing.

According to market research conducted by Pike Research, the widespread adoption of cloud computing could lead to a potential 38% reduction

in worldwide data center energy expenditures by 2020. The savings would be primarily achieved by consolidating data centers and maximizing power usage efficiency (PUE), improving recycling efforts, lowering carbon and gas emissions and minimizing water usage in cooling the remaining centers.

Because so much of a data center's energy expenditures support data storage, the Storage Networking Industry Association (SNIA) has promoted new technologies and architectures to help save energy. Advances in SAS drive technologies, automated data deduplication, storage virtualization and storage convergence reduce the amount of physical storage a data center requires, which helps decrease its carbon footprint and lower operating expenditures (OPEX) and capital expenditures (CAPEX).



Because the color green is also associated with paper money, the label *green cloud* is sometimes used to describe the cost-efficiency of a cloud computing initiative.

Benefits of Green Cloud:

According to Forbes, the Cloud will "simply be the accepted way of acquiring IT services and new applications." Making the move to the Cloud is not really a question of if a business is going to move to Cloud-based solutions but more of whether or not you will do it now – before your competitors do and before your customers ask why you haven't.

Fortunately, Green Cloud can make such a move smooth, comfortable, and beneficial for your business. Green Cloud's solutions can help you manage technology resources, drive productivity, and curtail costs – and make a positive impact on the environment in the process.

Technology Performance:

- Speedy adaptability and scalability to respond to dynamic needs of a business
- Increased reliability, redundancy, and security through world-class data centers
- Assurance of secure, reliable setting for mission-critical data
- Provision for business continuity / disaster recovery (i.e. hurricane, snow-storm)
- Access to leading platforms and technologies
- Business Productivity
- Availability of latest technology and high-quality solutions
- Increased employee productivity with data/services accessible from any location
- Stage set for corporate innovation / IT can concentrate on other initiatives and respond more rapidly
- Improvement in overall efficiency and business agility
- Cost Management
- Elimination of up-front expenditures on servers and phone equipment
- Minimized maintenance and support costs
- Lower power bills through reduced energy consumption
- Environmental Impact
- Manage energy infrastructure more effectively through a strong enabling platform
- Reduce energy consumption through increased efficiency and optimal server utilization.

Design by

E Bhavani