



गृह मंत्रालय
MINISTRY OF
HOME AFFAIRS



Project Report

On

Cyber-Dome

(Project No.06/MM:03)

Prepared by
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Ministry of Home Affairs
Govt. of India

'Promoting Good Practices and Standards'



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Kerala Police Cyber-dome

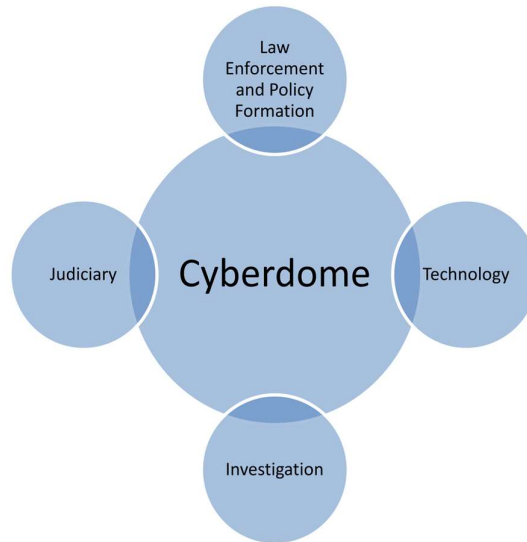
Introduction to the Kerala Police Cyber-dome Project

In this 21st century, we are living in a technology driven world where almost everything we used in our daily life is directly or indirectly connected to awesome technologies. The enhancements and Innovations have made Information and Communication Technologies (ICT) more common and cheaper to accessible for everyone in the society. Even the initial goal of the internet was to connect computers to share information, but in the last few years there has been a tremendous change and the today's Internet is very different than as it was in 15 years back.

The transition of mobile phones as smart phones and prevailing 3G networks blew up the number of internet users in Kerala. The statistics shows that the mobile density of Kerala is almost reaching to 100%. Number of internet users and e-literacy rate of the state are also sound to adapt with technology augmented services. The spread of Information Technology has led to many drastic changes in our economic, social and political life. The Internet has the benefit of being able to make public information and government services available on an "anytime, anywhere" basis. These services can be delivered to citizens, businesses, government employees and within the government. The word 'Cyber' is often used in relating to information technology, computers or the Internet, hence the word 'Cyber World' is pertinent to this virtual world where people communicating and collaborating in a great extend in their day to day life for online services such as banking, shopping, e-Governance services, trading, ticket booking as well as entertainment and social networking.

Along with the evolution of internet and information technology there was also a silent evolution of Cyber Criminalism. Since one of the specific characteristics of Internet that is Anonymity (at a certain extend) of the persons who deals in internet was being exploited by the criminals. As the complexity of the computer software increased, the vulnerabilities in it also became very common. The existence of these vulnerabilities helped the criminals. Criminals make use of this vulnerable nature of software to take control over the internet connected devices for their advantages. Hence the security of our cyber space is in under the threat of these Cyber Criminals as the large amount of private and public confidential digital assets as are kept connected to the internet. It is clearly evinced that even the most secured networks have been compromised by intruders. Cyber bullying, online cheating, harassing women and children online, defacement through social media, identity theft, online financial frauds, hacking, website defacement, prostitution, human trafficking, piracy etc. are some of the cyber crimes very common now a day. Besides these, Cyber Terrorism, Cyber Warfare and Darknets (Invisible Web) are some of the emerging challenges in the Cyber Space. The impact of Cyber Crimes is more dangerous when it comes to Air Traffic Control Systems, Nuclear Power Plants, and Health Care Systems. These equipments are relying on technology that can be penetrated by cyber criminals easily. Data and Information security of both Government and Private firms are also a great concern.

Bridging the Gap & Policy Formation



The investigation of cyber crimes, ensuring Cyber Security for citizens are still remain as challenging areas for Law Enforcement Agencies(LEAs), since cyber crimes involves most modern and sophisticated technologies and having an international nature as well as anonymity over the internet. The criminal are working in a borderless environment with laws of multiple jurisdictions and having a cumbersome procedures are to be followed to get the details of criminals. Cybercrime has evolved at an astonishing rate, and for a number of reasons cited above, but, unfortunately, our police agencies are not equipped to take a large role in cybercrime investigations and prevention of cyber crimes. Police don't have nearly enough resources and expertise to catch crooks to any meaningful extent. Now a day almost every crime has a technological aspect, hence Police department need to become proficient in adequate sets of cyber-skills that can help while handling with cyber crimes and Confronting Cyber crimes in an effective manner.

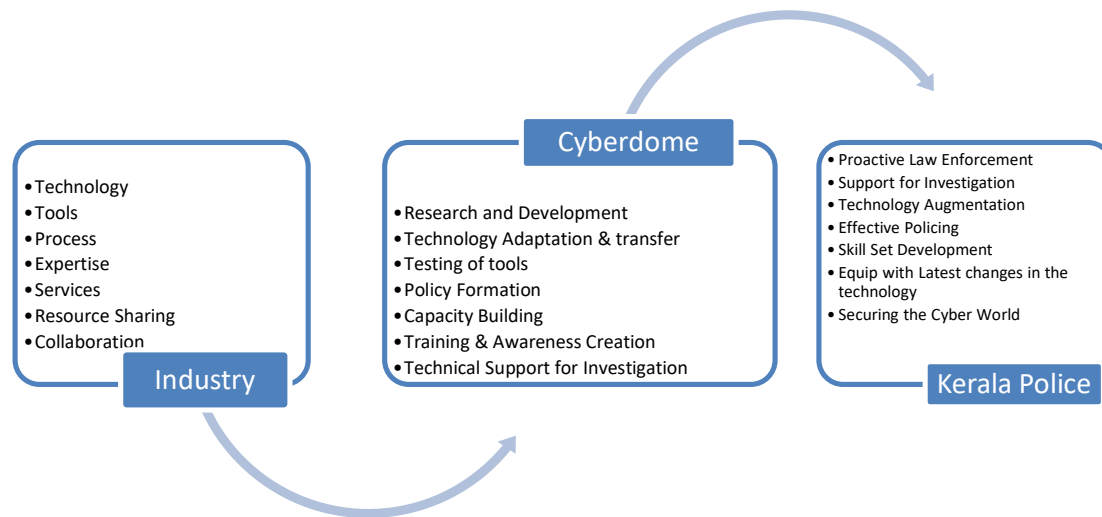
Taking into account of the broader impact of cyber crimes and challenges over a secure cyber space, Kerala Police initiated a proposal for the establishment of a Hi-tech Centre for Cyber Security and Innovations, to the Government. The Government examined the matter, and after various studies and expert committees, accorded administrative sanction to setup the Cyber-dome at Technopark Campus through Public-Private Partnership model.

What is Kerala Police Cyber-dome

Kerala Police has made a road map to establish, a unique and first of its Kind initiative, called “Kerala Police Cyber-dome ”- A High Tech Public Private partnership Centre for Cyber Security and handling of Cyber Crimes.

Cyber-dome is a technological research and development centre of Kerala Police Department conceived as a cyber centre of excellence in cyber security as well as technology augmentation for effective policing. It envisages as a high tech public-private partnership centre of collaboration for different stakeholders in the domain of cyber security and handling of cyber crimes in a proactive manner. One of the main objectives of the Cyber-dome is to prevent cyber crimes through developing a cyber threat resilient ecosystem in the state to defend against the growing threat of cyber attacks by synergizing with other departments and nodal agencies of the state. Cyber-dome makes a collective coordination among the Government departments and agencies, academia, research groups, non-profitable organizations, individual experts from the community, ethical hackers, private organizations, and other law enforcement agencies in the country with an aim of providing a safe and secure cyber world for each and every citizen in the state. We are also linked up to many national and international cyber security collaborations as well as to the law enforcement agencies to fight against the borderless nature of the cyber crimes. In order to address the highly challenging and dynamic nature of cyber threats, apart from the Government stakeholders, the centre is also working hand in hand with industry fraternity in public-private partnership model for equipping the Kerala Police by adapting the latest technologies of rapidly changing environment. The Industry and the software/technology companies are providing their technical expertise and capabilities to assist the police in various fields of cyber security and technology augmentation for effective policing such as developing new software, providing technical assistance, sharing of their resources, giving extensive training and knowledge sharing sessions, awareness creation, contributing to the research and adding development activities in the pertinent domains, and being a host of other areas as well. Centre is also aligned with lot of individual experts those who are having domain knowledge, unblemished background and committed to serve the society for a better tomorrow. Cyber-dome is operating an online office of technical experts, ethical hackers, and competent cyber security professionals who can assist the police in the area of cyber security, cyber crime investigation and domain knowledge updating. This online office is also holding a group of specially selected experts having professional competency who can give assistance and suggestions to the police to tackle the various cyber policing issues cropping up in the cyber world. As mentioned above, Cyber-dome is a Centre of Excellence of Kerala Police to meet long term security challenges in the digital arena of modern world by bridging the gap between latest changes and innovations in the cyber space and skill set development of Kerala Police in combating the emerging cyber threats, and a collaboration centre for both public and private fraternity to converge and share the information as well as resources that will escalate the safety of our cyber space.

Cyber-dome Role and Strategy



Major Divisions of Cyber-dome

Cyber Intelligence

1. **Cyber Intelligence:** Cyber-dome has a key role in providing insights for cyber intelligence by tracking and analyzing the activities of the cyber world. Social media analytics, anti-piracy measures on the internet, virtual policing, monitoring of online sex rackets, preventing child pornography, and countering cyber terror activities are the key focusing areas.
2. **Cyber Security:** Primary focusing area of Cyber-dome is cyber security as the protection of departmental systems, networks and data in cyberspace. Cyber-dome is to provide continuous attention that requires for protecting sensitive government and personal digital assets to safeguard national security.
3. **Incidence Response:** Cyber-dome is engaged with incidence response activities such as identifying the perpetrators of attack, assessment of damage and taking adequate steps to minimize the loss by using tools, techniques and resources at our disposal. Objective is to detect and react to the computer security incidents.
4. **Cyber Forensics:** Cyber-dome is setup with a cyber forensic division to provide technical support for investigation teams dealing with cyber crimes which involve scientific processes of identification, seizure, acquisition, authentication, analysis, documentation and preservation of digital evidence.
5. **Research & Development:** Cyber-dome is aimed to play a major role in the area of cyber security as well as cyber threat resilience research by collaborating with academic partners. Catering the technological advancements for Police to increase the effectiveness of the policing is another objective of the centre.
6. **Training & Awareness Creation:** Cyber-dome is holding the responsibility of keeping the police personnel in touch with the latest developments and trends in cyber world. Cyber-dome is also designed to engage and educate public through events and initiatives with the goal of raising awareness about Cyber security.
7. **Consultancy & Service:** Cyber-dome is offering Consultancy and Services in cyber security domain with joint ventures of private companies in a paid service model.

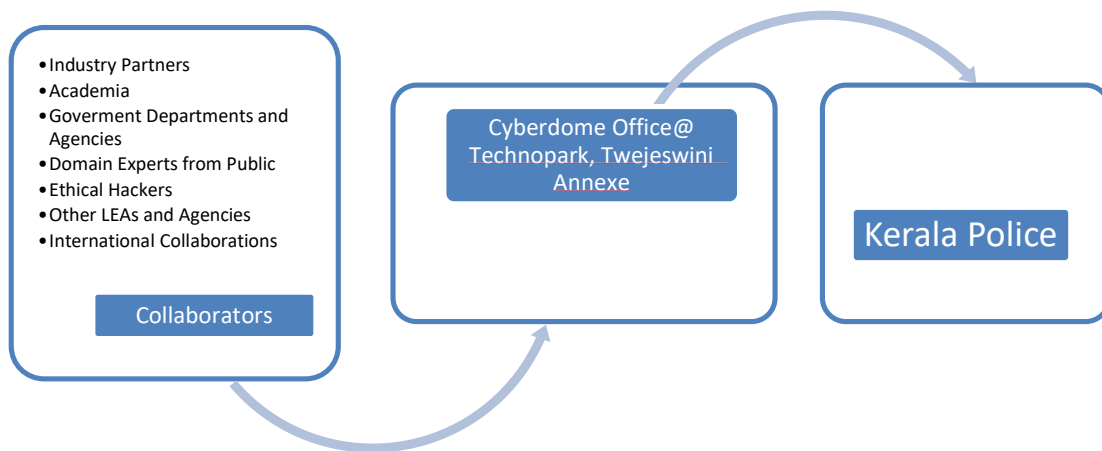
Why Cyber-dome ?

Cyber crime rate is rapidly increasing in Kerala day by day. Each crime involves a technology aspect in terms of a gadget or tool that is highly sophisticated. With the Internet assuming a central role in the society, its weaknesses have also come to the fore. The worldwide interconnected digital information and communications infrastructure collectively known as cyber space which underpins almost every aspect of modern society and renders vital support for the economy, governance, civil infrastructure, public safety, and national security. Increasingly, now a days it is observed that cyber criminals are frequently exploiting network vulnerabilities, terrorists are using the Internet for information exchange and communication. Online sexual violence and child sex abuse imagery, online frauds, terrorist activities, data loss and data breaches and identity theft as well as defacement are also common. The dark nets and cyber warfare are emerging areas of cyber threat. Hence a threat in any form in this cyber space is always a matter of concern for a law enforcement agency. Two major challenges to the law enforcement include jurisdiction issues and discovering the identity of a cyber criminal. Since the world is ever more dependent on the information and communications technology, the Kerala Police is supposed to deal with crimes unheard of a decade earlier. The issue of cyber security needs to move beyond traditional policing activities and requires a different outlook to deal with technology. To ensure effectiveness and coordinate response in tackling the emerging cyber security threats prevailing in the state, a technology centre is required to foster the capabilities and expertise of Kerala Police as well as to develop strategies to deal with this dynamic challenging environment of technology. Cyber-dome is a visionary initiative of Kerala Police to curtail and fortify the notoriously widespread cyber menaces from various criminal sources and dimensions towards our cyber space.

Why Public - Private Collaboration?

The dangers of cyber threats continue and pose significant challenges for a law enforcement agency not only in imparting the latest technologies for effectiveness of policing but also in deploying adequate manpower with sufficient skill sets to undertake the evolving dangers in the cyberspace. Since the highly sophisticated cyber threats continue to evolve and spike at a pervasive rate in Kerala, without expert collaboration and knowledge sharing, police lessen their ability to respond to cyber threats and may potentially expose themselves and their stakeholders to greater risks in cyber space, as perpetrators learn to exploit national, regional and global information and communication technology weaknesses one-by-one. Cybercrime is borderless by nature – this also creates difficulties in criminal investigation and makes more complicated for law enforcement authorities. To effectively tackle cybercrime, adequate cross-border provisions are required and international cooperation and mutual assistance within law enforcement, and between the other agencies, needs to be enhanced. Governments cannot contain these cyber threats single-handedly through domestic measures alone. Neither should governments be left to grapple with this danger on their own any

longer, as the expertise and skill to combat these cyber threats are largely dispersed across the globe. Hence the solution is that to create collaboration with private sector and academia to conform rapidly changing technology world. National cyber security policy also affirms in developing effective public – private partnerships models. Active partnership with the private sector is essential, not only to share intelligence and evidence, but also in the development of technical tools and measures for law enforcement to prevent online criminality. The academic community also has an important part to play in the research and development of such measures.



Cyber-dome Motto

“Partner us in making a secure cyber world”

Objective of the Cyber-dome

Create an active partnership with the private sector and adopt latest technologies, tools as well as services to the Kerala Police Department, and to equip the force to meet the real challenges of the cyber world, for fighting against the emerging cyber threats towards the society.

Cyber-dome Vision

"To establish a professional understanding and thereby carrying out skill development initiatives, impart knowledge about digital space, develop cyber defense skills and expertise, which in-turn will protect citizens, businesses, critical infrastructures of the state, and e-governance services by establishing a collaborative platform for cyber security to prevent, combat, investigate and mitigate cyber crimes in a proactive manner, which in-turn will provide a secure cyber space to the society."

Cyber-dome Mission

"Create a platform which brings together Government Departments, Law Enforcement Agencies, Industry, Academia, International Organizations and Experts from Public Domain for collaborating on Cyber Security to enhance the capabilities of the state in dealing with cyber threats as well as to provide security to the Digital Assets of the state."

Collaboration with Individuals and Companies

The Cyber-dome envisages an online office of Technical experts/Ethical Hackers/Cyber professionals, who can assist the police in the area of Cyber Security and Cyber Crime Investigation. This online office would contain a group of specially selected experts who will give assistance/suggestions to the police to tackle the various cyber policing issues cropping up in the cyber world. Hence we are pleased to call for nominations from Cyber Security Experts/ Ethical Hackers/Cyber Professionals to be nominated as "Cyber-dome Officers". Hence an Individual or a Software company is ready to associate with Kerala Police in this initiative can collaborate with Cyber-dome to make their contributions for a secure cyber world. The interested parties can send their willingness to Cyber-dome . The Cyber-dome can be built up and developed with the support of the citizens for ensuring a secure cyber world.

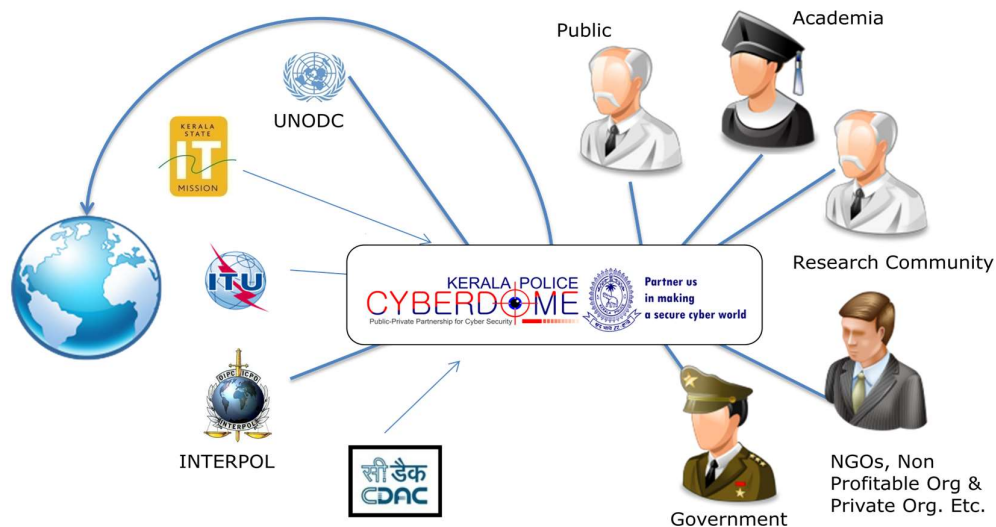
As an Individual

1. All nominations were scrutinized and based on their professional competency, unblemished background and domain knowledge they will be placed as online officers of Cyber-dome .
2. They are given ID Cards/Stars/ Ranks based on their contributions to the Cyber-dome project.
3. Since the Cyber-dome is a contributory project and so the volunteers are not entitled to any payments whatsoever, now or in the future. Hence persons who have a sense of social responsibility only expected to apply. Also persons who are already employed and well settled are preferred.

As a Company

1. NGO's/Organisations/Software companies also enter into a mutual agreement with Cyber-dome to develop various Policing software's and cyber solutions.
2. The Industry software companies have provided their technical experts to assist the police in various fields of crime monitoring, policing the web, assistance in the investigation of cyber crimes, development of new software for police and a host of other areas.
3. Some Companies were willing to support the Police, as a company itself, in specific tasks, without any financial costs to the department, and they are separately coordinating with the police in providing various solutions for cyber security. The company will be free to sell the software to other police forces in the country or outside.
4. The company is free to sell the software to other police forces in the country or outside.
5. All contributions are on a voluntary basis to Cyber-dome and in the interest of Cyber Security.

Cyberdome Collaboration



Project Status

Government accorded sanction for the Cyber-dome vide Government Order (MS) No.167/2014/ Home dated 22.08.2014 and 2523 Sq. ft. of space has been allotted at Technopark and the Center has started functioning with direct partnership with around 30 companies including some industry toppers, apart from this, in terms of academic partnerships, association in a research venture with IIITMK is sealed and joint research project are underway in various areas of cyber security. Around 500 ethical hackers have also registered and are presently working with Cyber-dome from various parts of the Globe, in the online office set up at Cyberdoem.

Major achievements

1. **Social Media Lab** With Social media becoming the major medium of communication and the nature of crimes shifting from traditional to cyber crimes, a new social media Lab for tackling

all the challenges that the social media poses for the police department is opened under Cyber Dome. The Centre is using various software's, including the one developed by IIT Delhi for Social Media analytics and also Cyber-dome has tied up with various Private Companies for Social Media Management and analytics, free of cost.

2. **Cocon Conference-** An annual international conference titled 'COCON' has successfully been organized for last few years by Kerala Police, to create a rapport with industry, academia and international collaborators in this domain.
3. **VAPT Analysis-** VAPAT (Vulnerability Assessment and Penetration Testing) was done on all major Government websites and Cyber-dome reported the vulnerabilities to the concerned for correction.
4. **WiFi Security-** Provided WiFi security for the 20th international Film Festival of Kerala 2015 conducted in December 2015 at Thiruvananthapuram and also conducted a WiFi audit in major cities of Kerala.
5. **Workshops/ Training-** Training/Workshops are conducted regularly on latest issues and trends in Cyber security for officials and member of the public in Thiruvananthapuram.
6. **Monitoring the Darknet –** In Association with certain companies and individuals, Cyber-dome is monitoring Darknet for proactive security.
7. **Offensive Strike capabilities-** A Cyber Defence corp has been setup with a group of individuals experts from the experts from the Cyber Security Industry, Capable of offensive cyber Attacks.
8. **Piracy Tracker-** A Software has been developed in partnership model and this has been very successful in preventing Piracy of films, particularly Malayalam movies.
9. **Online Safety of Children-** A programme named "KIDGLOVE" is initiated in areas like enhancing online safety for children, engaging parents in the cyber world thus helping to create good digital parents and it is expected to be extended to all schools in Kerala.
10. **Parental Control Software-** A new software to tackle this global menace of Online Child Abuse & Exploitation in order to protect and/or rescue children by establishing legislation, raising awareness, reducing access to harm and supporting children from abuse or exploitation, is under development.
11. **Anti Bank Fraud Cells-** A Special cell with a helpline has been created in association with RBI to tackle bank frauds , with particular reference to OTP frauds, Online frauds and hacking of the bank sector. An online office of all the major banks is made operational for information sharing.
12. **Association of Mobile Wallets-** A close liaison is being maintained with all mobile wallets on shared platform to plug holes in the transactions related to mobile wallets under the close supervision of the RBI.

13. **Location Tracking-** Cyber-dome in association with IITMK has developed a new software for exact pinpointing of mobile phone locations using the various GPRS coordinates available from the CELL ID and this will be useful to track down the absconding accused.
14. **Traffic Apps-** Cyber-dome in association with Strava Technologies has developed a Kerala Police Traffic Apps with a host of features for benefit of the travelling public.

The mission/version of the Cyber-dome centre is to “Ensure a Cyber Secure World” and in this drive we have got a huge response from the industry, the private sector and the professionals engaged in the IT Industry, who have come forth to partner us in this novel venture. Cyber-dome is thus marching ahead as a Law enforcement entity, in the vast and borderless World of internet, to keep it safe and secure. We call upon all stakeholders to partner us in this unique venture to build secure Cyber World.