INFOSOFT IT SOLUTIONS

Training | Projects | Placements

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INTERNET OF THINGS [IOT] SECURITY TRAINING

1:IntroductiontoIoTandSecurity Fundamentals

- Overview of IoT: Definition, applications, and trends.
- IoT architecture: Devices, gateways, cloud, and communication models.
- Basics of cybersecurity: Confidentiality, integrity, availability (CIA triad).

2: IoT Protocols and Communication Technologies

- IoT communication protocols: MQTT, CoAP, HTTP/HTTPS, AMQP.
- Wireless communication technologies: Zigbee, Z-Wave, LoRaWAN, Bluetooth, Wi-Fi.
- Security challenges in IoT communication.

3: IoT Threat Landscape and Attack Vectors

- Common IoT threats: Malware, DDoS attacks, data breaches.
- Attack vectors: Physical attacks, network attacks, application-level attacks.
- Case studies of notable IoT security incidents.

4: IoT Security Architectures and Frameworks

- IoT security architecture: Device, network, application, and data security.
- Security frameworks and standards: IoTSF, NIST, ISO/IEC 27030.
- Risk assessment and management in IoT.

5: Device and Network Security

- Secure boot and firmware updates.
- Device authentication and authorization.
- Network security: VPNs, firewalls, IDS/IPS for IoT.

6: Data Security and Privacy in IoT

- Data encryption and key management.
- Secure storage and transmission of data.
- Privacy concerns and regulatory compliance (GDPR, CCPA).

7: IoT Identity and Access Management (IAM)

- Identity management for IoT devices.
- Role-based access control (RBAC) and attribute-based access control (ABAC).
- OAuth, OpenID Connect, and other IAM protocols for IoT.

8: Intrusion Detection and Prevention in IoT

- Techniques for intrusion detection in IoT networks.
- Anomaly detection and behavioral analysis.
- Implementing IDS/IPS in IoT ecosystems.

9: Blockchain and IoT Security

- Introduction to blockchain technology.
- Use cases of blockchain in IoT security.
- Implementing blockchain for secure IoT transactions and data integrity.

10: Machine Learning for IoT Security

- Basics of machine learning and its application in security.
- Anomaly detection using machine learning.
- Case studies and practical implementations.

11: Secure Development and Deployment of IoT Systems

- Secure coding practices for IoT applications.
- DevSecOps for IoT.
- Testing and validating IoT security.
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12: Emerging Trends and Future Directions

- AI and IoT security.
- Edge and fog computing security.
- Quantum computing and its impact on IoT security.

ADVANCE TOPICS ;-

1: Introduction to IoT Security

- Overview of IoT and its applications
- Importance of IoT security
- IoT security threats and vulnerabilities
- Case studies of IoT security breaches

2: IoT Architecture and Protocols

- IoT system architecture
- Communication protocols (MQTT, CoAP, HTTP/HTTPS, LoRaWAN, etc.)
- Security implications of IoT protocols

3: IoT Device Security

- Device authentication and authorization
- Secure boot and firmware updates
- Hardware security modules (HSM)
- Case study: Securing a smart home device

4: Network Security for IoT

- Network segmentation and isolation
- Secure communication channels (TLS, DTLS)
- Intrusion detection and prevention systems (IDPS) for IoT
- Case study: Securing a smart city infrastructure

5: Data Security and Privacy in IoT

- Data encryption and integrity
- Secure data storage and transmission
- Privacy concerns and regulatory compliance (GDPR, CCPA)
- Case study: Healthcare IoT devices

6: Cloud and Edge Security in IoT

- Cloud security for IoT platforms
- Edge computing and security challenges
- Secure data processing at the edge
- Case study: Industrial IoT (IIoT) systems

7: IoT Security Frameworks and Standards

- Overview of IoT security frameworks (NIST, ENISA)
- Security standards and best practices (ISO/IEC 27001, IEC 62443)
- Implementing security frameworks in IoT projects

8: Threat Modeling and Risk Assessment in IoT

- Identifying and analyzing threats
- Risk assessment methodologies
- Developing and implementing mitigation strategies
- Case study: Threat modeling for a connected car system

9: Advanced Cryptographic Solutions for IoT

- Lightweight cryptography for IoT
- Public key infrastructure (PKI) in IoT
- Blockchain and distributed ledger technologies for IoT security
- Case study: Securing supply chain IoT systems

10: Secure IoT Development and Testing

- Secure coding practices for IoT
- IoT security testing tools and techniques
- Penetration testing and vulnerability assessment
- Hands-on lab: Conducting a security audit of an IoT device

11: Incident Response and Forensics in IoT

- Incident detection and response strategies
- Forensic analysis of IoT devices and networks
- Case study: Responding to an IoT security breach