



Information Security Engineers

15-1299.05

Bright Outlook



Updated 2025

A subset of this occupation's profile is available. Data collection is currently underway to populate other parts of the profile.

Develop and oversee the implementation of information security procedures and policies. Build, maintain and upgrade security technology, such as firewalls, for the safe use of computer networks and the transmission and retrieval of information. Design and implement appropriate security controls to identify vulnerabilities and protect digital files and electronic infrastructures. Monitor and respond to computer security breaches, viruses, and intrusions, and perform forensic investigation. May oversee the assessment of information security systems.

[Summary](#)[Details](#)[Custom](#) [Easy Read](#) [Veterans](#) [Español](#)[Contents](#)

Occupation-Specific Information

Tasks

[^ All 20 displayed](#)

- + Assess the quality of security controls, using performance indicators.
- + Conduct investigations of information security breaches to identify vulnerabilities and evaluate the damage.
- + Coordinate documentation of computer security or emergency measure policies, procedures, or tests.
- + Coordinate monitoring of networks or systems for security breaches or intrusions.
- + Coordinate vulnerability assessments or analysis of information security systems.
- + Develop information security standards and best practices.
- + Develop or implement software tools to assist in the detection, prevention, and analysis of security threats.
- + Develop or install software, such as firewalls and data encryption programs, to protect sensitive information.
- + Develop response and recovery strategies for security breaches.

- + Identify or implement solutions to information security problems.
- + Identify security system weaknesses, using penetration tests.
- + Oversee development of plans to safeguard computer files against accidental or unauthorized modification, destruction, or disclosure or to meet emergency data processing needs.
- + Oversee performance of risk assessment or execution of system tests to ensure the functioning of data processing activities or security measures.
- + Provide technical support to computer users for installation and use of security products.
- + Recommend information security enhancements to management.
- + Review security assessments for computing environments or check for compliance with cybersecurity standards and regulations.
- + Scan networks, using vulnerability assessment tools to identify vulnerabilities.
- + Train staff on, and oversee the use of, information security standards, policies, and best practices.
- + Troubleshoot security and network problems.
- + Write reports regarding investigations of information security breaches or network evaluations.

Find occupations related to multiple tasks

Technology Skills

[^ All 36 displayed](#)

- + **Access software** — IBM Tivoli software
- + **Application server software** — Docker 🔥; GitHub 🔥; Kubernetes 🔥
- + **Authentication server software** — Single sign-on SSO 💪
- + **Cloud-based data access and sharing software** — Platform as a service PaaS
- + **Cloud-based management software** — Amazon Web Services AWS CloudFormation 🔥; Google Cloud software
- + **Configuration management software** — Chef 🔥; IBM Terraform 🔥; Puppet 🔥
- + **Content workflow software** — Atlassian JIRA 🔥
- + **Data base management system software** — Elasticsearch 🔥; MongoDB 🔥; NoSQL 🔥
- + **Data base reporting software** — Microsoft SQL Server Reporting Services SSRS 🔥; Reporting software
- + **Data base user interface and query software** — Amazon Web Services AWS software 🔥; IBM DB2 🔥; Microsoft SQL Server 🔥; ServiceNow 🔥; [2 more](#)
- + **Development environment software** — Go 🔥; Microsoft Azure software 💪; Microsoft PowerShell 💪; Ruby 🔥; [3 more](#)
- + **Document management software** — Microsoft SharePoint 💪
- + **Electronic mail software** — Microsoft Outlook 🔥
- + **Enterprise application integration software** — Enterprise application integration EAI software; Jenkins CI 🔥; Microsoft SQL Server Integration Services SSIS 🔥
- + **Enterprise resource planning ERP software** — Management information systems MIS
- + **Enterprise system management software** — Splunk Enterprise 💪; Tanium software

- + **Expert system software** — Ansible software 🔥
- + **File versioning software** — Git 🔥
- + **Geographic information system** — Geographic information system GIS systems
- + **Graphics or photo imaging software** — Microsoft Visio 🔥
- + **Internet directory services software** — Active directory software; Microsoft Active Directory 🌐; Network directory services software; Oracle Unified Directory
- + **Network monitoring software** — IBM QRadar SIEM; Microsoft Azure Sentinel; Snort; Wireshark; [1 more](#)
- + **Network security and virtual private network VPN equipment software** — Firewall software 🛡️
- + **Network security or virtual private network VPN management software** — IBM Resource Access Control Facility RACF; Intrusion detection system IDS
- + **Object or component oriented development software** — C# 🔥; Oracle Java 🌐; Perl 🔥; R 🔥; [2 more](#)
- + **Office suite software** — Microsoft Office software 🔥
- + **Operating system software** — Apple iOS 🔥; Microsoft Windows Server 🔥; Red Hat Enterprise Linux 🔥; UNIX Shell 🔥; [7 more](#)
- + **Presentation software** — Microsoft PowerPoint 🔥
- + **Project management software** — Atlassian Confluence 🔥; Microsoft Teams 🔥
- + **Risk management data and analysis software** — ArcSight Enterprise Threat and Risk Management; McAfee Enterprise Security Manager
- + **Spreadsheet software** — Microsoft Excel 🔥
- + **Switch or router software** — Border Gateway Protocol BGP 🔥
- + **Transaction security and virus protection software** — Microsoft Defender Antivirus; Microsoft Security Essentials; Tenable Nessus
- + **Transaction server software** — IBM Middleware
- + **Web platform development software** — JavaScript 🔥; JavaScript Object Notation JSON 🔥; PHP 🔥; React 🔥; [2 more](#)
- + **Word processing software** — Collaborative editing software



Hot Technologies are requirements most frequently included across all employer job postings.

[See all 58 Hot Technologies for this occupation.](#)



In Demand skills are frequently included in employer job postings for this occupation.

[See all 14 In Demand skills for this occupation.](#)

Occupational Requirements

Detailed Work Activities

All 21 displayed

- + Manage information technology projects or system activities.
- + Develop software or computer applications.
- + Install computer software.
- + Analyze security of systems, network, or data.

- Coordinate reporting or editing activities.
- Develop operating strategies, plans, or procedures.
- Develop performance metrics or standards related to information technology.
- Establish work standards.
- Evaluate potential of products, technologies, or resources.
- Evaluate utility of software or hardware technologies.
- Implement security measures for computer or information systems.
- Investigate illegal or suspicious activities.
- Monitor processes for compliance with standards.
- Provide technical guidance to other personnel.
- Read documents to gather technical information.
- Recommend changes to improve computer or information systems.
- Supervise information technology personnel.
- Test computer system operations to ensure proper functioning.
- Train personnel in technical or scientific procedures.
- Troubleshoot issues with computer applications or systems.
- Write reports or evaluations.

Find occupations related to multiple detailed work activities

Experience Requirements

Job Zone

Title Job Zone Four: Considerable Preparation Needed

Education Most of these occupations require a four-year bachelor's degree, but some do not.

Related Experience A considerable amount of work-related skill, knowledge, or experience is needed for these occupations. For example, an accountant must complete four years of college and work for several years in accounting to be considered qualified.

Job Training Employees in these occupations usually need several years of work-related experience, on-the-job training, and/or vocational training.

Job Zone Examples Many of these occupations involve coordinating, supervising, managing, or training others. Examples include real estate brokers, sales managers, database administrators, graphic designers, conservation scientists, art directors, and cost estimators.

SVP Range (7.0 to < 8.0)

Training & Credentials

State training

Select a State

Go

Local training

ZIP Code

Go

Certifications

Find certifications nationwide

Apprenticeship Opportunities

[All 1 displayed](#)

Example apprenticeship titles for this occupation:

- Cyber Defense Incident Responder

Specific title(s) listed above are vetted by industry and approved by the U.S. Department of Labor for use in a Registered Apprenticeship Program.

Start your career and build your skillset. Visit [Apprenticeship.gov](#) to learn about opportunities related to this occupation.

Worker Characteristics

Interests

[All 3 displayed](#)

Interest code: **CIR**

Want to discover your interests? Take the [O*NET Interest Profiler](#) at My Next Move.

- **Conventional** — Work involves following procedures and regulations to organize information or data, typically in a business setting. Conventional occupations are often associated with office work, accounting, mathematics/statistics, information technology, finance, or human resources.
- **Investigative** — Work involves studying and researching non-living objects, living organisms, disease or other forms of impairment, or human behavior. Investigative occupations are often associated with physical, life, medical, or social sciences, and can be found in the fields of humanities, mathematics/statistics, information technology, or health care service.
- **Realistic** — Work involves designing, building, or repairing of equipment, materials, or structures, engaging in physical activity, or working outdoors. Realistic occupations are often associated with

engineering, mechanics and electronics, construction, woodworking, transportation, machine operation, agriculture, animal services, physical or manual labor, athletics, or protective services.

Workforce Characteristics

Wages & Employment Trends

Median wage data for **Computer Occupations, All Other**.

Employment data for **Computer Occupations, All Other**.

Industry data for **Computer Occupations, All Other**.

Median wages \$52.39 hourly, \$108,970 annual
(2024)

State wages Select a State

Local wages ZIP Code

Employment 470,900 employees
(2023)

Projected growth  Much faster than average (9% or higher)
(2023-2033)

Projected job openings 34,800
(2023-2033)

State trends Select a State

Top industries [Professional, Scientific, and Technical Services](#)
(2023) [Government](#)

Source: Bureau of Labor Statistics [2024 wage data](#) and [2023-2033 employment projections](#). "Projected growth" represents the estimated change in total employment over the projections period (2023-2033). "Projected job openings" represent openings due to growth and replacement.

Job Openings on the Web

State job openings Select a State

Local job openings ZIP Code

More Information

Related Occupations

▼ 5 of 10 displayed

- 15-1231.00 [Computer Network Support Specialists](#) ☀
- 15-1211.00 [Computer Systems Analysts](#) ☀
- 15-1212.00 [Information Security Analysts](#) ☀
- 15-1244.00 [Network and Computer Systems Administrators](#)
- 15-1299.04 [Penetration Testers](#) ☀

Professional Associations

Disclaimer: Sources are listed to provide additional information on related jobs, specialties, and/or industries. Links to non-DOL Internet sites are provided for your convenience and do not constitute an endorsement.

National Associations

▼ 5 of 19 displayed

- [ASIS International](#) ↗
- [Association for Computing Machinery](#) ↗
- [Computer Professionals for Social Responsibility](#) ↗
- [Cybersecurity Collaborative](#) ↗
- [Digital Forensic Research Workshop](#) ↗

Regional Associations

- [Middle Atlantic-Great Lakes Organized Crime Law Enforcement Network](#) ↗
- [Midwest Cyber Security Alliance](#) ↗
- [New England Regional Developers](#) ↗
- [Northeast Regional Computing Program](#) ↗
- [Southwest CyberSec Forum](#) ↗

Accreditation, Certification, & Unions

▼ 5 of 7 displayed

- [CompTIA](#) ↗ **ALLY**
- [EC-Council](#) ↗ **ALLY**
- [Cloud Security Alliance](#) ↗
- [International Association of Computer Investigative Specialists](#) ↗
- [International Secure Information Governance and Management Association](#) ↗