A FUTURE IN

COMPUTER NETWORKS & SECURITY
WHAT ARE CAREERS IN NETWORKS AND SECURITY ALL ABOUT?

Computer networks are an inextricable part of modern life. We use computers and mobile devices to access the Internet and to connect with others in most if not all aspects of our work, education, and leisure. Networks with hundreds or thousands of users are operated by schools, universities, businesses, governments and other organisations. Qualified professionals are required to design, build and maintain these networks.

Along with this rapid explosion of inter-connectivity, there is a corresponding exposure of the networks and the connected devices to nefarious activities such as hacking, information leaks, and all forms of cyber-attacks. Graduates who have a sound understanding of networking and security are needed.

Are you interested in the challenges involved in designing, building, and maintaining large computer networks? Do you find satisfaction in helping organisations of all kinds protect their networks and information assets in an increasingly connected world? Do you love to solve practical problems, and keep up with new technologies? If so, a career in computer networks and network security could be just the thing for you.
OUTLOOK AND TRENDS

As the country’s third largest export earner, the ICT industry is New Zealand’s fastest growing sector. It contributes nearly $20 billion to the economy and employs more than 62,000 people. (www.nztech.org.nz – Industry Overview)

Computer network security is of paramount concern for all users. In New Zealand, we have experienced high-profile data security problems within the government and we are seeing increasing regulatory demands and legislative requirements for security within the financial services industry.


Cloud computing is radically changing the way computer applications and services are constructed, delivered and managed. New techniques are needed using software-defined networks to manage shared data, protect privacy, metering and billing, communications, and security of the information to make the most of the benefits of cloud computing, such as resource sharing, economies of scale and scalability.

An increasing trend for healthcare to be delivered in the home, with patients fully informed and empowered to understand their healthcare options, is behind the development of a $200 million Health IT export industry for New Zealand that is estimated to rise to $500 million by 2015. The use of IT and networks is also expected to play a dominant role in preventative health care, with new sensor technologies being coupled with more traditional IT infrastructure to aid clinicians and other health sector workers.

WORK SETTINGS

Graduates find employment in a range of industries from large corporations to smaller businesses. Opportunities are available in industry, commercial organisations, government departments, NGOs and research and development centres, as well as academic environments.

Network and security professionals are employed in almost all medium to large organisations and many have dedicated teams of network and security managers and professionals.

The work is usually based in an office environment. Roles may be within the IT department of the company/organisation, or in a separate security-related department.

It may be necessary to travel locally or internationally to visit clients and to attend conferences and professional development/training sessions. Many roles involve working in regular business hours. However some require evening or weekend work to complete projects or carry out maintenance.

CAREER EXAMPLES

**Systems administrator**
Monitors resource consumption and performs remedial actions. Locates and fixes hardware and software problems. Liaises with service providers and suppliers of hardware/software. Plans, evaluates and executes new developments. Liaises with clients/users about specific requirements and produces reports.

**Network security specialist**
Monitors activity on computer systems and networks for security breaches. Keeps up to date with the latest viruses, worms and other malware. Implements firewalls and installs anti-virus software on servers and computers within the networks. Develops, trains staff, and enforces security policies.

**Security analyst**
Advises on information security practices and enhancements. Installs firewalls, intrusion protection and detection systems, cryptography and other security measures. Manages system/software patches and upgrades at regular intervals. Monitors server security, security logs and alarms, and manages incidents swiftly and decisively. Carries out regular reporting and risk assessments.

**Network Designer**
Draws up network implementation plans. Works with network architects on detailed design of network. Often involves in-house networks or larger, distributed mainframe systems. This design work can be very complex, with involving large numbers of protocols, platforms and software solutions that need to communicate with each other.

Visit www.sans.org/20coolestcareers for descriptions of top information security and cybersecurity roles.
SKILLS AND KNOWLEDGE
It is essential to have strong communication skills and the ability to liaise with stakeholders at all levels.

Transferable skills
• Ability to communicate with clients, demonstrating strong interpersonal skills
• Know how to handle confidential and sensitive information with discretion
• Work well in a team environment, with minimal supervision
• Plan ahead and meet deadlines
• Good at problem-solving and time-management
• Competency in business processes and software including MS Word, Excel, PowerPoint and Outlook.

Technical skills and software
• A range of desktop and server administration systems
• Windows, Mac, Linux platforms
• LAN, WAN, WLAN, DMVPN, SSL/IPSEC, VPN, firewalls, WWAN design and implementation
• CCNA or CCNP cert (or Juniper equivalent).

PERSONAL QUALITIES
• Methodical, accurate and patient
• Able to work well under pressure, and meet deadlines
• Loyal and trustworthy
• Able to relay complex information in easily understood terms.

PROFESSIONAL REGISTRATION
This profession requires at least a bachelor’s degree in information systems with coursework or on-the-job training in network and security systems. Certifications such as a Cisco Certified Networking Professional or as a Microsoft Certified Professional are also helpful.

Professional accreditation is available through the Institute of IT Professionals New Zealand, via the CTech and CITPNZ certifications http://iitp.nz/Certification

ISACA (www.isaca.org) is a global professional association offering membership and appropriate certifications, e.g. CISA, CISM, CISSP.

SALARY GUIDE
To stay competitive internationally, most IT jobs in New Zealand now provide a package with additional benefits, such as health care plans, company paid training, additional annual leave.

<table>
<thead>
<tr>
<th>Role</th>
<th>Salary (per year)</th>
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<tbody>
<tr>
<td>Systems administrator</td>
<td>Junior/Intermediate $45,000 - $75,000</td>
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<tr>
<td></td>
<td>Senior $75,000 - $100,000</td>
</tr>
<tr>
<td>Network engineer</td>
<td>1st level $40,000 - $55,000</td>
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<tr>
<td></td>
<td>2nd level $55,000 - $88,000</td>
</tr>
<tr>
<td></td>
<td>3rd level $90,000 - $120,000</td>
</tr>
<tr>
<td>Security analyst</td>
<td>$60,000 - $90,000</td>
</tr>
<tr>
<td>Security consultant</td>
<td>$100,000 - $140,000</td>
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</tbody>
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Sources: Recruit I.T. Salaries Update Dec 2014; AbsoluteIT Remuneration Report Dec 2014, payscale.com
Salary range is indicative of the New Zealand job market at the time of publication (early 2015) and should only be used as a guideline.

THE AUT ADVANTAGE
AUT students undertake a research and development project in Year 3 involving an industry or research centre client. They develop skills and gain experience through projects with companies like Fisher & Paykel Healthcare, Eagle Technology and FutureTech.

AUT graduates have studied the curriculum of the Cisco CCNA and CCNA security certification exams. Apart from studying the underlying theory, graduates obtain the practical skills to design, and implement security measures using Cisco routers and switches.

FURTHER STUDY OPTIONS
Further study in networks and security is available at postgraduate level, including postgraduate certificates and diplomas in either Computer and Information Sciences or Science. They can also undertake study at masters level, including Analytics, Computer and Information Sciences, Information Security and Digital Forensics, Science, or a Master of Philosophy and Doctor of Philosophy.
“I chose Networking and Security as a career path because I am a practically minded person, so networking and the hardware aspect was appealing to me. Plus I like the challenge and technicality of security – being one step ahead of the people that have bad intentions, and keeping important things safe.

The main purpose of my role is to ensure that what is being developed provides value to Orion Health and their customers. My everyday tasks and activities include: using a range of tools to verify that application components are functioning correctly, setting up automated test scripts, setting up different environments, and analysing test results and logs to determine the causes of problems or issues.

I am moving to the UK soon to take up a new position as an Implementation Consultant, a role that is more focussed on setting up customer sites. Looking further ahead, I am still deciding between heading towards a technical role or a managerial role, but the great thing is my AUT degree has geared me to have the option to do either.”

Malinda Wickramasinghe
Senior Test Engineer, Orion Health (Auckland)

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“In this industry there are growing trends towards automation and performance testing. There is an emphasis on high quality work as well as a need to meet strict deadlines.

We look for strong analytical and troubleshooting skills, and the ability to work without close supervision. You need to be able to grasp new skills and knowledge quickly, and have the initiative to find the required resources on your own. Daniel has shown strength in all of these areas.

My advice for students is to keep up to date with the latest technologies, to improve your analytical, troubleshooting and time management skills, and to build good relationships with developers.”

Malinda Wickramasinghe
Senior Test Engineer, Orion Health (Auckland)
USEFUL WEBSITES

Institute of IT Professionals
www.iitp.org.nz

New Zealand Technology Industry Association
www.nztech.org.nz

Summer of Tech
www.summeroftech.co.nz

FURTHER INFORMATION

For the most up to date information on Networks and Security studies and the Bachelor of Computer and Information Sciences, please visit our website: www.aut.ac.nz/networks-security

FUTURE STUDENTS
Contact the Future Student Advisory team for more information: www.aut.ac.nz/enquire
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EMPLOYABILITY & CAREERS
For other Future Career Sheets visit: www.aut.ac.nz/careersheets

For employability and career support, AUT students can book an appointment through https://elab.aut.ac.nz/

CITY CAMPUS
55 Wellesley Street East, Auckland Central

SOUTH CAMPUS
640 Great South Road, Manukau, Auckland

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The information contained in this career sheet is correct at time of printing, August 2019.