

## Achievement Standard

**Subject Reference** Digital Technologies 3.50

**Title** Demonstrate understanding of wide area network technologies

**Level** 3      **Credits** 4      **Assessment** Internal

**Subfield** Technology

**Domain** Digital Technologies

**Status** Registered      **Status date** 4 December 2012

**Planned review date** 31 December 2019      **Date version published** 17 November 2016

This achievement standard involves demonstrating understanding of wide area network technologies.

### Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Demonstrate understanding of wide area network technologies.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate in-depth understanding of wide area network technologies.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate comprehensive understanding of wide area network technologies.</li> </ul>

### Explanatory Notes

- 1 This achievement standard is derived from Level 8 of the Technology learning area in *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007; and is related to the material in the *Teaching and Learning Guide for Technology*, Ministry of Education at <http://seniorsecondary.tki.org.nz>.

Further information can be found at <http://www.technology.tki.org.nz/>.

Appropriate reference information is available in *Safety and Technology Education: A Guidance Manual for New Zealand Schools*, Ministry of Education at <http://technology.tki.org.nz/Curriculum-support/Safety-and-Technology-Education>, and the Health and Safety at Work Act 2015.

This standard is also derived from *Te Marautanga o Aotearoa*. For details of *Te Marautanga o Aotearoa* achievement objectives to which this standard relates, see the [Papa Whakaako](#) for the relevant learning area.

- 2 *Demonstrate understanding of wide area network technologies* involves:
- describing Wide Area Network (WAN) technologies
  - explaining why the components have been used in a WAN to achieve the desired characteristics
  - describing the use of WAN protocols in a WAN architecture.

*Demonstrate in-depth understanding of wide area network technologies* involves:

- comparing and contrasting the characteristics and the purposes of different WAN technologies and components
- explaining the layers in the Transmission Control Protocol (TCP)/Internet Protocol (IP) networking model and the role of this model in a WAN architecture
- comparing and contrasting IP addressing with reference to static addresses and dynamically obtained addresses.

*Demonstrate comprehensive understanding of wide area network technologies* involves:

- explaining the WAN technologies and components of a WAN
- explaining IP addressing schema
- explaining how Network Address Translation (NAT) provides a form of firewall
- explaining the management procedures for a WAN link.

- 3 A WAN consists of a number of networked devices, which includes Personal Computers (PCs), connected using a telecommunications link and routers.

- 4 The components of a WAN include but are not limited to:

- Desktop PC
- Laptop
- Switch
- Modem/Router
- Network Storage
- Cables.

- 5 WAN technologies include but are not limited to:

- WAN protocols (e.g. Ethernet, Asymmetric Digital Subscriber Line (ADSL))
- basic routing principles including static routing
- common wired, optical and wireless technologies
- WAN architecture specified in terms of physical topologies and logical topologies.

- 6 In demonstrating an understanding of wide area network technologies, configuring a router using the web-based interface includes: modifying user information, IP address, subnet mask, default gateway; configuring Dynamic Host Configuration Protocol (DHCP); securing the router with an administrator password.

- 7 IP addressing schema includes: IP address, subnet mask, default gateway, the use of static and dynamic addresses, NAT and the concept of public and private IP addresses.

- 8 Management procedures for a WAN link includes but is not limited to: saving current configuration, restoring factory defaults, modifying NAT settings, monitoring traffic throughput, modifying the range of services available via the router (e.g. wireless networking and firewall functions).

- 9 Conditions of Assessment related to this achievement standard can be found at <http://ncea.tki.org.nz/Resources-for-aligned-standards/Technology/Level-3-Technology>.
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### Replacement Information

This achievement standard, AS91632, AS91634, and AS91636 replaced AS90684.

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### Quality Assurance

- 1 Providers and Industry Training Organisations must have been granted consent to assess by NZQA before they can register credits from assessment against achievement standards.
- 2 Organisations with consent to assess and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Consent and Moderation Requirements (CMR) reference

0233