Government of Canada | Gouvernement du Canada

connecting.canadians

CANADA'S SCHOOLNET

LEARNING WITHOUT BOUNDARIES

CONNECTIVITY

WWW.SCHOOLNET.CA/SNAB/BROCHURE

Canada

C O N N E C T I V I T Y

Options for both external and internal connectivity are displayed in the table to the right.

Do you want to connect your school to the Internet? Are you getting lost in all the emerging technologies? Here are some options to get you started.

There are two types of connectivity: external and internal.

External connectivity refers to connecting schools to the Internet and schools to each other. Technological choices for external connectivity are influenced by the geographic location and size of your school, the learning applications you plan to support, and your budget.

Internal connectivity refers to connecting the computers in a school together to form an intranet. Ethernet has become the networking standard for internal connectivity. Ethernet networks are constructed in a star configuration with individual computers connected to hubs or switches, but you can use different approaches to wire computers to the hub or switch.

On March 30, 1999, through the efforts of Industry Canada's SchoolNet and its provincial, territorial and private sector partners, Canada became the first nation in the world to connect its schools and public libraries to the Information Highway. SchoolNet continues to work with its partners to extend connectivity from schools to classrooms by March 31, 2001, bringing the benefits of the Information Highway to Canadian learners. This will result in 250,000 connected computers, an equivalent of one per classroom.

We must also champion new methods of connectivity to offer more students access to the creative and sophisticated learning tools that broadband networking technology makes possible. The SchoolNet Access Registry will be a key source of connectivity solutions for the Kindergarten to Grade 12 education community in Canada. It will provide a repository of connectivity solutions, a collection of case studies and best practices, an interactive planning guide and much more.

This brochure is one of five describing the activities of the Working Groups of the SchoolNet National Advisory Board. SchoolNet is a collaborative initiative of federal, provincial and territorial governments, the private sector and the education community, to connect schools and libraries to the Internet and is part of Connecting Canadians, the Government of Canada's strategy to keep Canada among world leaders in connecting its citizens to the Internet. The other brochures in this series are Professional Development, Research, Measurement, and Social Issues.

To obtain additional brochures, a detailed technical paper on connectivity or more information on Canada's SchoolNet, visit www.schoolnet.ca or contact:

Canada's SchoolNet
155 Queen Street – 4th Floor
Ottawa, ON K1A 0H5
www.schoolnet.ca/snab/brochure
schoolnet@ic.gc.ca
1-800-575-9200

Connectivity Method	Description	Bandwidth	External Connectivity			Internal Connectivity
			Urban	Rural	Remote	
TERRESTRIAL						
Dial-up Internet	Connecting to the Internet through a modem and telephone lines	56 Kbps modems give reasonable connectivity	✔	✔	✔ Some Use	Non Applicable
ISDN	A circuit-switched digital technology used to create point-to-point links to Internet service providers (for dedicated connections) or between buildings	Basic rate ISDN supports two 64 Kbps digital channels. Can be bonded together to create one 128 Kbps pipe	✔	✔	Not Available	Non Applicable
Dedicated connections	A connection between a school and an Internet service provider	Varies from 64 Kbps to 45 Mbps (T3)	✔	✔ Up to T1 in some areas	Not Available	Non Applicable
XDSL	High speed Internet services – presently offered by several companies; can also be used to connect buildings	Asymmetrical bandwidth of about 1 Mbps into the school and 300 Kbps out of the school	✔	✔ Extremely Limited	Not Available	Non Applicable
Cable-based modems	Offered by many cable TV companies	Asymmetrical bandwidth capacity of about 30 Mbps into the school and up to 10 Mbps out of the school. Shared bandwidth means that speed into the school is actually about 1 Mbps	✔	✔ Extremely Limited	Not Available	Non Applicable
Fiber optics	Unused carrier fiber or fiber installed by school board is used to transmit data between schools and school board office	Depends on the electronics installed to transmit data: up to 1 Gbps	✔	✔ Maybe available in some areas	Not Available	Non Applicable
Ethernet, hub or switched LAN	Applicability depends on the age and architecture of the school – running cables through ceilings and walls can be problematic	Cables installed should support 100 Mbps Ethernet even if less is needed at present	Non Applicable	Non Applicable	Non Applicable	✔
Powerline technology to connect computers in a school together to form a LAN	Uses existing electrical wiring to transmit data – new technology		Non Applicable	Non Applicable	Non Applicable	New proposed technology
WIRELESS						
LMCS (Local Multipoint Communications Systems) Operates in 28 GHz Spectrum	A broadband wireless telecommunication carrier service can be used to connect schools to an Internet service provider	Undetermined May be between T1 and T3	✔	✔ (in the 127 areas served by a carrier)	Not Available	Non Applicable
MCS (Multipoint Communication Systems) Operates at 2.5 GHz	Radio systems where a main hub radio station communicates with many locations in an area – can carry Internet access, video and other applications	Undetermined May be 1-10 Mbps	✔	✔	✔ Maybe available in some areas	Non Applicable
ISM (Industrial, Scientific, and Medical) Band Unlicensed bands at 900 MHz, 2.4 GHz, 5.0 GHz and 24 GHz	Unlicensed terrestrial wireless technology for external and internal use	Bandwidth between 2-5 Mbps for external connectivity	✔	✔	✔	✔
Wireless technology to connect computers in a school together to form a LAN	Uses spectrum technology to transmit data over short distances indoors	1 Mbps – 2 Mbps A few new products have 10 Mbps	Non Applicable	Non Applicable	Non Applicable	✔
SATELLITE						
Satellite-Based Datacasting	Internet feeds to schools are via satellite, return pads are via wireline or MSAT technology. SchoolNet uses the DirecPC service that implements this approach	Satellite broadcast downstream to schools: up to 400 Kbps	Not intended here	✔	✔	Non Applicable
VSAT	Two way satellite service: can be used for Internet connectivity	Various bandwidths possible	Not intended here	✔	✔	Non Applicable
Future Multimedia Satellite service using Ka-band	New Ka band multimedia satellite services are being developed in next 2-3 years	Multimedia capabilities	Not intended here	Available in 2003	Available in 2003	Non Applicable

C O N N E C T I V I T Y

Cat. No.: C2-486/2000-1
ISBN: 0-662-64816-1
53044 B