

## GNWT Computing and Data Communications Systems and Communications Division of PW&S

**Our lives** have changed considerably since IBM first began constructing computing devices, and since Steve Jobs and Steve Wozniak built the world's first microcomputer in 1976, in their garage, with a capital investment of \$1,300. In fact, any PC now being used in the government has much more computing power than IBM's early mainframes.

This *Getting Results* newsletter features Public Works and Services' Systems and Communications (S&C) Division, which operates the GNWT's data centre and wide area data communications network. In a nutshell, the division's 18 employees perform these services for the GNWT:

- **Computer Services and Operations:** headquarters and regional data centres, departmental and corporate applications processing and support, report and cheque production, user identification and password administration, and tape management.
- **Technical Support:** operating system and software support for the mainframe computers in the headquarters data centre, third-party software used on this equipment, and data base administration.
- **Data Communications:** the wide area data communications network, including connections



*The 2nd floor of the Stuart M. Hodgson Building in Yellowknife houses the GNWT's headquarters data centre and communications network, and Systems and Communications Division staff.*

*"I think there is a world market for maybe five computers."*

*Thomas Watson, Chairman of IBM, 1943*

- to the digital communications network and the Internet.
- **Corporate Electronic Mail:** OpenMail is the corporate e-mail system used for exchanging messages within the GNWT, and to and from the Internet.
- **Web Site:** [www.gov.nt.ca](http://www.gov.nt.ca)

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## Computer Processing

**S&C manages** the GNWT's large Hewlett-Packard computers, including five HP3000 and five HP9000 UNIX servers, which host departmental and corporate business systems. The HP3000s are used to process departmental business systems such as the Financial Information System, for testing and development of systems, and for testing new releases of operating systems and third-party software. An HP3000 is also located in the regional data centres in Fort Smith and Inuvik.

The HP9000 servers are used to process the PeopleSoft and Tangible Capital Assets applications, to serve as the host for OpenMail, and for PW&S's iRIMS (records management) and AMANDA (safety services) systems. The HP equipment has an up-time rating of 99.91%, and is available to GNWT staff 24/7/365, excluding times designated after midnight for system backups.

Besides the 10 large Hewlett-Packard servers in the Yellowknife data centre, there are several other pieces of equipment used for various purposes including:

- the GNWT web server;
- the GNWT network firewall;
- a gateway between GNWT e-mail and the Internet;
- a 'testing' facility used to test new departmental business systems, third-party software and changes to the GNWT web site, for their impact on the Digital Communications Network, before going into production mode; and
- one server for use by all GNWT local area networks to locate the addresses of remote systems that employees wish to communicate with.



*The computer operations area showing the bank of operations consoles and operator PCs that are connected to all the larger servers.*



*These Hewlett-Packard 3000 systems host applications such as FIS, the Northern Health Info Management System, Motor Vehicles licensing and registration, the Housing Corporation's financial system, and many others.*



*A variety of HP3000s, HP9000s and smaller servers host applications such as PeopleSoft, AMANDA, iRIMS and the GNWT e-mail system. The servers are available to GNWT staff 24/7/365, except for backup time after midnight.*

### Brief history of computers... ...the next generation?

- Computers are into their fourth generation.
- The first generation ran on vacuum tubes. The first digital one was built in 1939; the first major computer built in 1946 was 100 feet long, 10 feet high and three feet wide.
- The second generation used transistors – the same used in transistor radios – shrinking computers drastically.
- The third generation used integrated circuits and silicon semiconductors.
- We're into the fourth generation of computers, which now use microprocessors and silicon microchips.

## Technical Support

**Three** software specialists manage the operating systems and related software such as PowerHouse and Minisoft that drive the HP3000 and HP9000 computers in the GNWT data centres. Tech Support also provides data base administration services for applications using Oracle data bases, and directly supports production applications such as the on-line telephone directory and the IDMS Document Management application belonging to the FMBS. As well, Tech Support provides a variety of technical

consulting and support services for Information Technology (IT) staff in other departments, and directly to government employees experiencing technical difficulties. As the GNWT data centres are available around the clock, a Technical Support specialist is on call 24/7/365.



*Backups to magnetic tape are critical. Computer Operators do the backups regularly, ensuring that any data from any computer system can be recovered if required, in case of server or application malfunctions. About 8,000 magnetic tapes are used for the backups. The majority of these tapes are kept off site in secure storage, ensuring data remains available in case of serious damage to a data centre.*

## Reports

**S&C operates** computers that generate about 600,000 pages of reports for its clients each month. The printers, some of which are shown in the photo, include several laser printers for the reports, and impact printers for special forms such as cheques and health certificates. Printing is usually done outside normal business hours, with reports being available to departments for pickup in the division's customer services area by 8:00 each morning. Besides the printers located in the data centre, S&C has configured system printers in remote locations across the Northwest Territories, so that reports generated in the data centre can be printed in more than 80 government offices throughout Yellowknife and in most communities.



*Some of the printers operated by Systems and Communications, with part of the library of backup tapes in the background.*

### Computer services stats

User IDs and passwords secured on computers in GNWT data centres .....	8,500+
Corporate information systems .....	70+
Pages of reports processed monthly by all printers connected to the Yellowknife and regional data centres .....	600,000
Remote system printers connected to servers in GNWT data centres across the NWT .....	80+
Number of daily/weekly backups .....	90+

## E-mail increases 400% in three years

**The division** manages the GNWT’s corporate electronic mail system, OpenMail. Over 2,100 OpenMail licences are being used by GNWT staff throughout the North. Virtually all OpenMail users employ Microsoft Outlook to access and manage their e-mail.

Three years ago, in the final year for the OpenDesk e-mail system, GNWT employees sent and received 1,000,000 messages. GNWT e-mail use has increased 400% in just three years, as shown in the statistics table below.

Along with the growing number of messages sent by government e-mail users, there’s a growth in the size of the messages. Because it’s so easy to include attachments in e-mail messages, this system is a key method for exchanging data files, both internally within the government, and to and from the Internet. The maximum allowable size of a message including attachments is now 10 megabytes.

This limit is under review, and will most likely be reduced. Messages that size have a very negative impact on inter-community e-mail, and cause all other network traffic to slow down considerably until the message has been transmitted.

### E-mail virus protection

Systems and Communications has installed virus protection software on the OpenMail server to prevent viruses from the Internet, or from departmental LANs, from being distributed by e-mail. On average, three to five messages with viruses are intercepted daily. The virus protection software has prevented major viruses such as “Melissa” and “I Love You” from invading the GNWT OpenMail system, thus preventing the major down time experienced by some corporations and governments worldwide.

### E-mail tip – using “Sent Items”

Microsoft Outlook has a setting for users to automatically keep copies of all e-mail messages they send – in a folder called “Sent Items”. Instructions for activating this feature depend on the software version being used, so consult your departmental IT manager. If you automatically save your sent messages in “Sent Items”, you won’t have to c.c. yourself on your own messages. If you’re outside Yellowknife and you c.c. yourself, the message travels to the OpenMail server in Yellowknife, then back via satellite to your PC. By using the “Sent Items” folder rather than copying yourself on sent messages, you’ll reduce data traffic on the digital communications network circuit to Yellowknife, particularly if your message contains an attachment.

### First computers

- The GNWT’s first computer in 1970 had 5.4 megabytes of storage.
- In 1976 Steve Jobs and Steve Wosniak raised \$1,300, started Apple Computers, and built in their garage the first microcomputer with its own keyboard and monitor.
- The first computer glitch was caused by a moth caught inside a computer – hence the terms ‘bug’ and ‘debugging’.

### Electronic mail statistics (average monthly figures)

GNWT employees on OpenMail .....	2,100+
OpenMail messages created (all GNWT) monthly .....	330,000
Number of messages sent to Internet from OpenMail monthly .....	131,000
Number of messages received by OpenMail users monthly .....	537,000
Average size of message sent or received .....	40 kilobytes
Maximum size of an OpenMail message, including attachments .....	10 megabytes
Volume of messages sent and received monthly .....	13 gigabytes
1 kilobyte =	1,000 bytes
1 megabyte =	1,000,000 bytes
1 gigabyte =	1,000,000,000 bytes

## GNWT web site – [www.gov.nt.ca](http://www.gov.nt.ca)

**The government's** web site continues to grow as departments add more information and functionality to their portion of "www.gov.nt.ca". The electronic visitors to our web site include employees from other governments, business people, students and other people from around the world. The GNWT web site is crucial in portraying a positive image of both the government and the Northwest Territories, to people from near and far. It's obvious from feedback from our virtual visitors that they

perceive us as one of the last frontiers, where the activities, lifestyle and environment make the NWT a fascinating place to visit and explore, either in person or by the World Wide Web.

S&C hosts the primary GNWT web server, as well as several departmental web servers, in the Yellowknife data centre. Technical support and administration are provided for this equipment, and operations staff back up these servers nightly. S&C's Web Administrator manages "www.gov.nt.ca" and provides

assistance to departments in developing, managing and operating their home pages. Web services for departments also include applying updates to their portion of the web site, consulting on web site development and enhancement, and producing web statistics for departments.

The number of hits on the GNWT web site has increased greatly during the past year. Some interesting web site statistics for a typical month are shown in the Q&A box below.

### **Q&A** on the web site

*Q. What's the size of [www.gov.nt.ca](http://www.gov.nt.ca) in pages?*

A. Over 80,000 pages are on the primary GNWT web server alone.

*Q. How many hits does the web site get from inside the GNWT?*

A. 3,378,020 hits from 22,453 different visitors in one month in 2001.

*Q. What are the most visited pages?*

A. The home page, the on-line telephone directory, and job opportunities.

*Q. Where are our virtual visitors from?*

A. GNWT employees accounted for 22% of all visits to our web site. Our external visitors live in most countries in the world. In descending order for a typical month in 2001, our top 20 most frequent visitors were from U.S.A., Canada, Australia, U.K., Japan, Netherlands, Germany, France, Saudi Arabia, Austria, New Zealand, Qatar, Belgium, Malaysia, Norway, Singapore, Switzerland, Denmark, South Africa and Mexico.

*Q. What sort of feedback or requests for information does the GNWT get from our electronic visitors?*

A. The government web site gets four to seven requests for information or feedback messages daily. The feedback is mostly very complimentary. Requests for information come from a variety of sources: students working on research projects, staff with other governments, individuals planning vacations to the North, people looking for government publications, legislation and regulations, and many other sources. S&C handles all requests immediately, either by forwarding messages to designated departmental contacts, or by responding directly to the simpler requests. S&C believes that quick and thorough responses reflect very well on the government and the NWT as a whole.

# GNWT Computing and Data Communications

## WAN and LANs

**The GNWT's** wide area network (WAN) is a complex interconnection of over 100 local area networks (LANs) in GNWT offices in all NWT communities. With most of the computer processing being done in Yellowknife, the WAN enables government offices in all communities to connect to the servers in Yellowknife, or through to the Internet. The WAN also includes high-speed connections to health centres and schools in every

community. Health and Social Services uses the WAN to run their tele-health program, enabling specialists in Yellowknife or in southern hospitals to consult with and diagnose patients in nursing stations and hospitals across the North.

The Government of Nunavut is still using some GNWT departmental information systems, accessing these systems by satellite across the WAN.

## Need help or advice?

Any GNWT employee experiencing technical difficulty or needing assistance can call Systems and Communications' Trouble Line (867-873-7979). If possible, the caller's problem is resolved immediately. If this isn't possible, the call is immediately referred to another S&C employee, or to IT staff in the caller's department.

### For more information, contact:

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Part of the communications section showing the network servers, including the Internet links.



Part of the communications section showing some of the modems, routers and switches that interconnect the local area networks and the Yellowknife fibre-optic network with the GNWT wide area network.

*"Our mission is to deliver quality services to satisfy the needs of our customers, while achieving the best value for government, communities, businesses and residents."*

D. Bruce Rattray, Deputy Minister