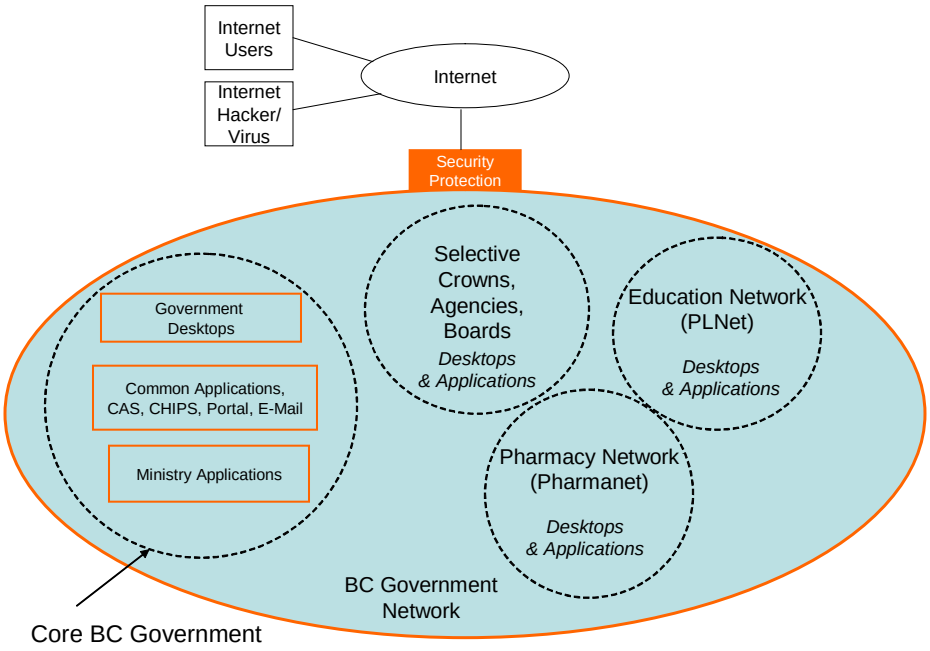
THE CHANGING THREAT TO INTERNET SECURITY

STATUS REPORT

June 2004

All BC Government applications operate within a single, private data/voice network. All ministries, schools (kindergarten to grade 12), colleges, pharmacies, and many agencies, boards and commissions use this network as the backbone of their information technology infrastructure. This private network protects all corporate applications such as e-mail, CAS, and the government portal, as well as all ministry applications. The network is, in turn, connected, through various layers of security protection, to the internet. The shaded area in the diagram below depicts the BC government's private, security protected network (called SPAN/BC).

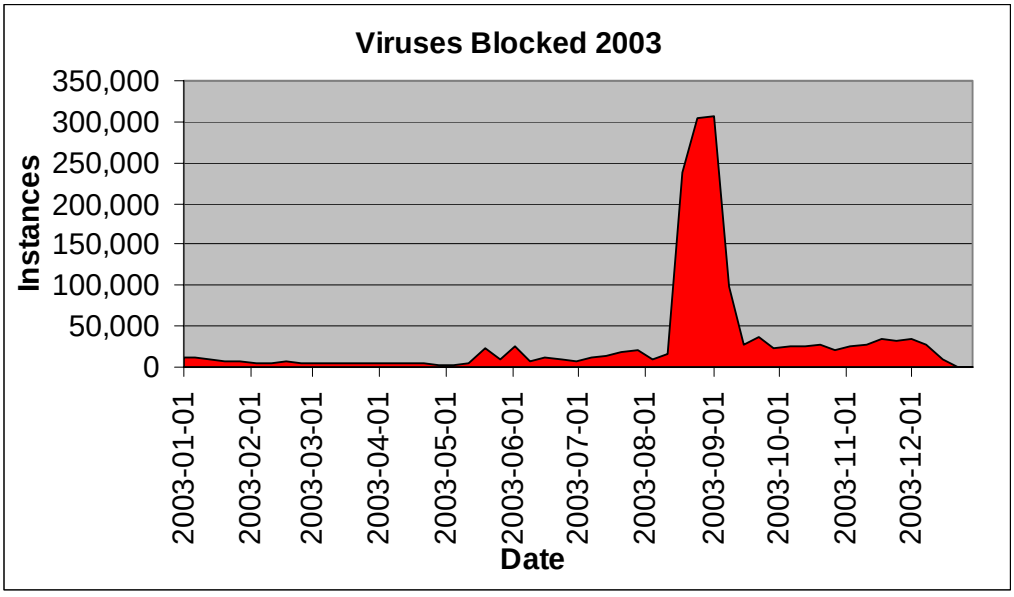


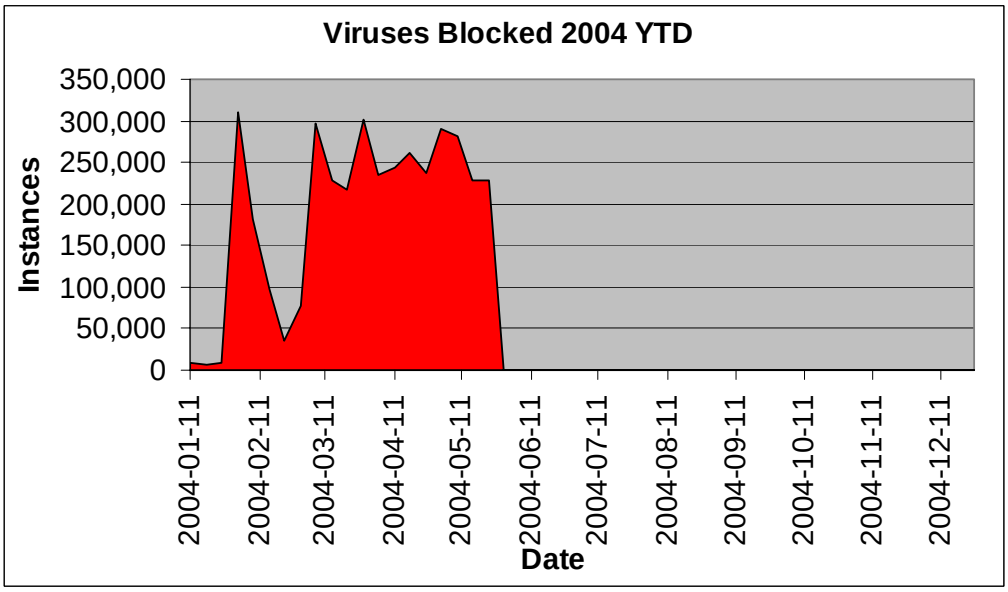
The IT Security Branch manages and responds to the risks to government's IT infrastructure. In doing so, the Branch works closely with industry specialists such as Microsoft, Symantec, and Deloitte & Touche to assess risks and determine appropriate response action. The Branch also works with municipal, provincial, federal, territorial and international governments to assess risks, share intelligence and coordinate response strategies.

The federal government recently released Canada's National Security Policy. It outlines the national plans to reduce Canada's vulnerability to cyber attacks. The United States government also recognizes the dangers of internet vulnerabilities, and has established the

Federal Computer Incident Response Centre as a response and coordinating group (see attached). British Columbia has an important part to play as work progresses nationally and internationally to collectively improve cyber security.

The graphs below indicate the virus (and worm) activity blocked from entering the BC government network. Of significant concern is the rapid increase in potential attacks to government's systems. Over 1.6 million instances were blocked in 2003, while in the first three months of 2004, over 3.0 million were blocked.





The BC Government has had four major breaches during the last year. The cost of these infections has not been quantified, but the business impact to ministries last summer by one incident alone (Blaster) was estimated to be over $0.8 million.

The IT Security Branch works with Common Information Technology Services (CITS) to identify risks, to ensure all systems are 'patched' for known risks, and to block malicious traffic. Risks are identified by vendor community companies such as Microsoft, UNIX, Sophos, etc. The IT Security Branch assesses each risk for applicability to BC government systems and determines how critical it is to patch the risk. Patches are written by industry and must be tested and applied by CITS.

The patches installed on many of the government workstations are not up to date. Work is underway to bring all of the patches to current requirements and to maintain current patch levels for all applications. Individual ministries are responsible for maintaining ministry specific applications.

Fiscal Year 2003/04 Upgrades:

Last fiscal year, in response to an IT Security Branch review of the status of government's overall information technology security, Treasury Board approved $1.23 million in additional funding in January, 2004, to begin to enhance the security of government's network.

The additional funding enabled IT Security to complete the following:

- A review of the capabilities of current tools that assess and monitor systems' activity to determine the most effective tools for the BC government network;
- A review and recommendations regarding user access;
- An analysis of requirements to improve network router security;
- A draft Security Incident Response Plan; and
- Significant improvements (over $ 0.5 million) to the physical security for key IT infrastructure sites.

Approximately $0.8 million of the approved $1.23 million was expended. The full amount was not spent because:

- funding was approved later than anticipated; and
- unprecedented virus activity took staff resources away from these projects.

The latest worm (gaobot) that entered the BC government's network in May caused serious disruptions to many programs. The identity of many users could not be verified, therefore users were denied access to numerous systems for much of Tuesday, May 11, 2004. Once the worm was contained, the passwords of all users were changed and strengthened significantly. A post incident review is underway.

There are continuing requirements to significantly improve the security of the BC government's existing infrastructure, in part because the nature of threats continues to evolve.

For example:

- In the past viruses had a nuisance impact, caused little damage and required user intervention to propagate. The complex worms now in circulation spread without user intervention, shut down systems through traffic overload or destructive code, and leave behind damaging software. They are almost impossible to eliminate because they create hidden code and redefine themselves as they move through the system;
- Time frames of attacks are such that there is often little or no lead time for response; and
- Network automated tools allow hackers to repeatedly check organizations for vulnerabilities on a continuing basis.

Our current private network security is less able to adequately address the increasing number and variety of threats. Industry and best practices experts advise that a robust infrastructure, designed with more safeguards than were required in the past, and built with an emphasis on security, is necessary to protect government's electronic information.

The current IT security infrastructure of the government remains vulnerable. Even short interruptions in service due to virus attacks or compromised systems could cause significant business disruption and jeopardize critical services. Such disruption could affect all government ministries as well as all of the other organizations (schools, pharmacies, and other agencies, boards and commissions) on the BC government network. These disruptions will extend to other non-government systems such as those of service providers, where they attach directly to the government network. A serious service outage could require weeks of effort and significant financial resources in order to recover operations.

The next priorities for the IT Security Branch in protecting government information will include:

- Developing and implementing an infrastructure redesign plan which includes a robust network security architecture;
- Establishing an effective measure of the security level of the IT infrastructure;
- Improving processes for user access to the network and applications; and
- Establishing effective monitoring, reporting and auditing of network and ministry activities.
- Developing baseline security standards.

Attachment

Attachment

STATEMENT OF THE HONORABLE KAREN EVANS
ADMINISTRATOR FOR ELECTRONIC GOVERNMENT AND
INFORMATION TECHNOLOGY
OFFICE OF MANAGEMENT AND BUDGET

BEFORE THE
COMMITTEE ON GOVERNMENT REFORM
U.S. HOUSE OF REPRESENTATIVES

October 16, 2003

Good morning, Mr. Chairman and Members of the Committee. Thank you for inviting me to discuss Internet vulnerabilities and the dangers they pose to citizens, businesses and governments. My testimony today will focus on the Federal government's response to this growing cyber threat.

Dangers and Vulnerabilities presented by the Internet

The Internet connects over 171,000,000 computers and continues to expand at a rapid pace. At any point in time, there are millions of connected computers that are vulnerable to worms, viruses or denial of service attacks. Malicious actors can take advantage of these vulnerable machines and harness them together to create large scale attacks. Many attacks are fully automated and spread with blinding speed across the entire Internet community.

The private sector has become increasingly dependent on the Internet and now uses it for mission critical applications as well as online business transactions. Even relatively short interruptions in service can cause significant economic loss and can jeopardize critical services.

Similarly, the Federal government's reliance on the Internet will continue to grow in the years ahead. The healthy functioning of cyberspace will be essential to our homeland and national security.

Awareness of Internet Dangers

The Federal Computer Incident Response Center (FedCIRC) within the Department of Homeland Security is the Federal government's focal point for coordinating response to cyber attacks (non-law enforcement), promoting incident reporting, and cross-agency sharing of data about common vulnerabilities. As part of its duties, FedCIRC informs Federal agencies about current and potential security threats from the Internet.

Working with FedCIRC, OMB and the CIO Council have developed a process to rapidly counteract identified threats and vulnerabilities. CIOs are advised via conference call, as well as follow up e-mail, of specific actions needed to protect agency systems. Agencies must then report through FedCIRC to OMB on the implementation of the required countermeasures. In particular, we track data concerning the percentage of systems patched and the time needed to complete mitigation efforts.

FedCIRC maintains a strong relationship with a number of industry as well as government partners. These partners include commercial software vendors, Carnegie Mellon University's Computer Emergency Response Team, law enforcement, the intelligence community, and agency incident response teams. These organizations routinely communicate advance notice to DHS regarding the discovery of software vulnerabilities and the development of malicious code designed to exploit these weaknesses.

Steps the Federal Government is Taking to Protect Itself from this Growing Threat

National Institute of Standards and Technology

Securing cyberspace is an ongoing process, as new technologies appear and new vulnerabilities are identified. The National Institute of Standards and Technology (NIST) provides timely guidance to federal agencies on securing networks, systems, and applications. NIST recommends that agencies implement a patch management program, harden all hosts appropriately, deploy antivirus software to detect and block malicious code, and configure the network perimeter to deny all traffic that is not necessary. Additional recommendations include user awareness briefings as well as training for technical staff on security standards, procedures, and sound security practices. Per longstanding OMB policy, Federal agencies are directed to follow NIST guidelines.

NIST has produced a number of recent publications that address agency security practices. These publications include: a Guide to IT Security Services, Selecting Information Security Products, Network Security Testing, Building an IT Security Awareness and Training Program, and Security Considerations in the Information Systems Development Life Cycle. Earlier guidance included: Securing the Public Web Server, Electronic Mail Security, IT Contingency Planning, Security Metrics, System Administrator Guidance for Securing Win 2000, Wireless Security, Security Patch Management, Intrusion Detection Systems, Firewall Security, and Risk Management.

As part of its statutory responsibilities under the Federal Information Security Management Act, the National Institute of Standards and Technology published in September a draft Computer Security Incident Handling Guide. This publication seeks to help both established and newly formed incident response teams respond effectively and efficiently to a variety of incidents. More specifically, this document discusses organizing a computer security incident response capability, establishing incident response policies and procedures, structuring an incident response team, and handling incidents from initial preparation through the post-incident lessons learned phase. Finally, it discusses handling a range of incidents, such as

denial of service, malicious code, unauthorized access, inappropriate usage, and multiple component incidents.

Federal Information Security Management Act

Another critical mechanism used to enforce protection of Federal systems is the Federal Information Security Management Act (FISMA). Under FISMA, Federal agencies are required to periodically test and evaluate the effectiveness of their information security policies, procedures and practices. The results of both the agency self assessments and the IG assessments are provided to OMB each September. OMB submits a summary report to Congress based on the agency and IG reports.

Federal Enterprise Architecture

Improving the federal government's response to Internet based attacks also requires that we focus on enterprise architecture and the standardized deployment of security technologies. As new technologies become available and cost effective, they must be incorporated into the IT infrastructure where they can monitor common precursors and indications of attack.

Challenges Facing the Federal Government in Creating a More Secure Cyber-Environment

Attack Attribution

Because of the global nature of cyberspace, vulnerabilities are accessible to anyone anywhere with sufficient capability to exploit them. Discerning the source of malicious activity is often difficult. The federal government will continue to rely on federal, state and local law enforcement to investigate and prosecute developers of worms, viruses and denial of service attacks. Agencies must continue to report computer incidents and assist law enforcement investigations to the greatest extent possible.

Managing Vulnerabilities inherent in Commercial Software

Vulnerabilities result from weaknesses in technology as well as improper implementation and oversight of technological products. The National Strategy to Secure Cyberspace recommends that the software industry consider promoting more secure "out of the box": installation and implementation of their products, including increasing user awareness and user friendliness of their security features.

Use of Security Benchmarks

OMB supports agency use of enterprise licensing agreements which require vendors to configure software to meet security benchmarks. As an example, the Department of

Energy recently signed an agreement with Oracle Corporation which calls for the vendor to deliver its database software in a securely configured manner.

Use of Trusted Products

In addition, the federal government will soon begin a comprehensive review of the National Information Assurance Partnership (NIAP). One thing they will consider is to what extent, if any, NIAP can address the continuing problem of security flaws in commercial software products. This review will include lessons-learned from implementation of the Defense Department's July 2002 policy requiring the acquisition of products reviewed under the NIAP evaluation process.

Patch Management

Because of software vulnerabilities, patch management is an essential part of an agency's information security program and requires a substantial investment of time, effort and resources. Agencies must carefully follow predefined processes in order to successfully remediate system vulnerabilities across the enterprise.

These processes include: identifying all affected systems and related software revision levels, fully testing the patch before it is placed into a production environment, and prioritizing installation of the patch based on the criticality of the system. Alternative solutions such as judicious use of port blocking must be implemented if the patch cannot be installed.

At the present time, forty-seven agencies subscribe to FedCIRC's Patch Authentication and Dissemination Capability. This service validates and quickly distributes corrective patches for known vulnerabilities.

Conclusion

The Federal government is the world's largest consumer of information technology. Because of its vast inventory and the vulnerabilities inherent in commercial software, the Federal government will, for the immediate future, continue to be impacted by threats from the Internet. Through our oversight of agency security policies and practices, OMB will continue to work with agencies to ensure that the risks associated with cyber attacks are appropriately mitigated.

In closing, OMB is committed to a federal government with resilient information systems. The dangers posed by the Internet must not be allowed to significantly affect agency business processes or disrupt services to the citizen. OMB will continue to

work with agencies and the Congress to ensure that appropriate countermeasures are in place to reduce the impact of Internet borne attacks.

Source: http://www.whitehouse.gov/omb/legislative/testimony/evans/031016_evans.html