STATUS OF ISAC CONTROL SYSTEM

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Abstract

The ISAC facility at TRIUMF has expanded considerably during its initial years of operation, and now includes complex ion sources, both room temperature and superconducting accelerators, as well as numerous complex experimental facilities. As the ISAC facility expanded and the size of the user community increased, the limitations in the initial controls configuration have become apparent. In order to cost effectively deal with these issues, many changes have been made in the hardware and software in use at ISAC.

This poster will discuss the migration of some primary ISAC Controls services to less expensive Intel/Linux computers as well as the isolation and segregation of the ISAC Controls Network to ensure a robust and secure Control Systems.

Linux Workstations

Initial Configuration:
- Operator workstations were Microsoft Windows PCs
- Windows proved to be unreliable and unstable, which was unacceptable for 24x7 operations environment

Present Configuration:
- Linux consoles are used heavily in several control rooms for months at a time
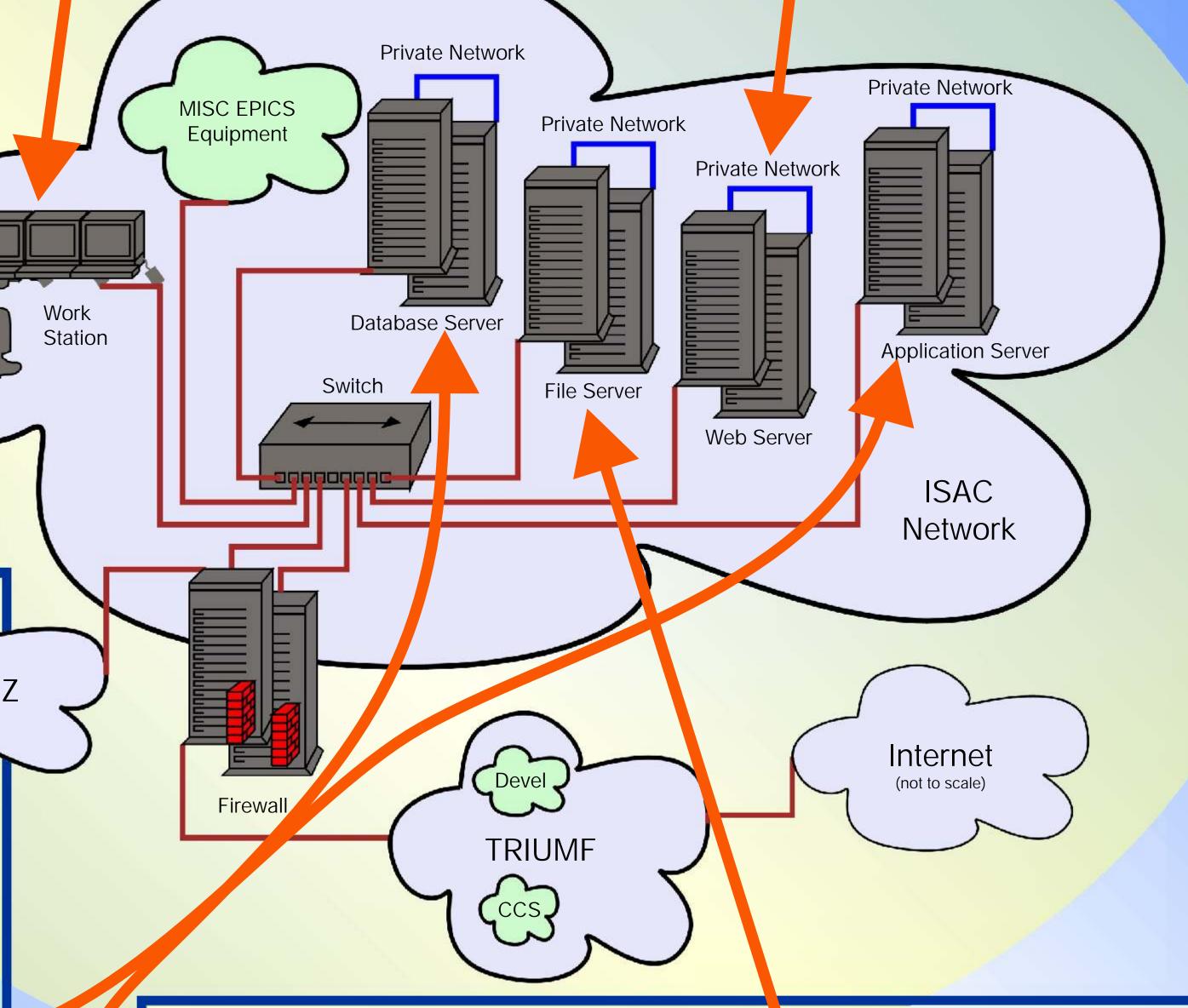- All functionality has been duplicated and reliability improved immensely

Linux Web Servers

Initial Configuration:
- Microsoft Windows NT web servers

Present Configuration:
- Naturally progressed to redundant Linux web servers running Apache
- Linux is a mature web serving platform, standard tools are used

Linux Firewalls

Initial Configuration:
- Network setup was ISAC on the TRIUMF public network
- This was convenient for developers, but controls reliability became was an issue

Present Configuration:
- Redundant Linux firewalls have been installed to protect ISAC controls
- Demilitarized zone has been created to quarantine secondary ISAC controls
- Firewall has been made VLAN aware in order to effectively operate on the evolved TRIUMF network

Linux Application Servers

Initial Configuration:
- Solaris workstation with a similar on-line machine available as an emergency replacement
- Significant work was required to swap in the replacement machine
- Increased in user base meant that existing hardware was reaching server limits

Present Configuration:
- Redundant Linux application servers installed
- Hardware installed was much more powerful than Solaris solution for a fraction of the cost
- Other software changes (EPICS gateway) also help to minimize impact of additional users

Linux File Servers

Initial Configuration:
- Microsoft Windows NT file server for developers
- Operators used remote X access, no file sharing was required

Present Configuration:
- Linux file server running Samba installed for developers
- Redundant Solaris and Linux file servers installed for Operations

Linux Database Servers

Initial Configuration:
- Microsoft Windows Paradox database used for configuration management
- Operations information maintained in flat files

Present Configuration:
- Redundant Linux database servers using PostgreSQL and MySQL installed for both Developers and Operations
- Many thousands of records are now stored across several databases

Summary

The use of personal computer hardware along side freely available, open source operating systems and applications has proven to be an intelligent choice for ISAC. While costs have been kept to a minimum, the overall system stability and availability has been increased enormously.