

► Challenge

To support multi-system access and share a highly available data storage infrastructure among multiple agencies

► Solution

Designing an IP SAN by deploying a SANRAD iSCSI V-Switch, Microsoft's Advanced Windows ADV Server 2000 MSCS clustering technology and Intel's iSCSI intelligent (HBA) host interface network card, all connected to the PowerLeader disk-array enclosure GS4012

► Benefits

- Cost-efficient solution achieved under budget
- Secure and trusted access to logical volumes
- Based on familiar IP infrastructure
- Centralized storage management & virtualization
- Compatible with wide range of storage arrays and server operating systems

Xinhui District Consolidates Storage by Moving to IP SAN

SANRAD enables 14 towns and villages to ensure data redundancy



Project Background

The Chinese government is actively building a network infrastructure to improve its organizational workflow, management mechanism and resources allocation. This intranet serves as a core foundation for various government agencies. The project was designed to address the following issues:

- To set-up an intranet so that it satisfies real-world government needs.
- To have the intranet improve performance and efficiency under tight budgets.
- To support multi-system access and share a highly available data storage infrastructure among multiple agencies.
- To consolidate differing types of back-end storage systems into a single centrally managed system.

SANRAD's integrator in China, Power Leader, designed an IP SAN storage management solution that met the project's requirements by deploying SANRAD iSCSI V-Switch, Microsoft's Advanced Windows ADV Server 2000 MSCS clustering technology and Intel's iSCSI intelligent (HBA) host interface network card.

User Requirements

The government in the Xinhui District of Jiangmen City of Guangdong Province recently implemented a networking system using a Cabletron SmartSwitch Router 8600 at its core, configured as a Gbit Ethernet switch. The ports are divided into three layers and are dedicated for users of private networks, servers of private networks and servers of public networks. This network is connected to the local telecommunication network, including cable TV networks, via a broadband connection. Sub-networks of 14 counties under the Xinhui District are connected to the data center.

Within this advanced networking environment, and with the help of PowerLeader Technology, one of the leading server solution providers in the People's Republic of China, the Xinhui District was able to build an IP SAN storage management system based on the most advanced iSCSI HBA card from Intel plus the iSCSI V-Switch from SANRAD.

Three applications are included for the data center as Phase One of the project:

- Public Website Server System - Six website systems serve as portals offering information and announcements from government management and other administration services for the Xinhui District.
- Administration Verification and Approval System: An AEMS Administration Verification and Approval System offers one highly efficient, secure and easily used information and office automation system for both the Internet and intranet.
- Fourteen Data Backup Systems for Villages and Towns: Each county under the Xinhui District will have its own independent database system and is backed up to a centralized information center for better data security. All the information from the 14 distributed counties will centrally backup to the network center of Xinhui District via iSCSI, a block-level transportation protocol.

High security and full availability of these application systems are needed as part of normal operations. The available storage capacity required for each system is more than 100GB per volume at each data center with an additional 20GB of data backup space. In total, 2TB of scalable storage was needed. The operating system is Windows 2000.

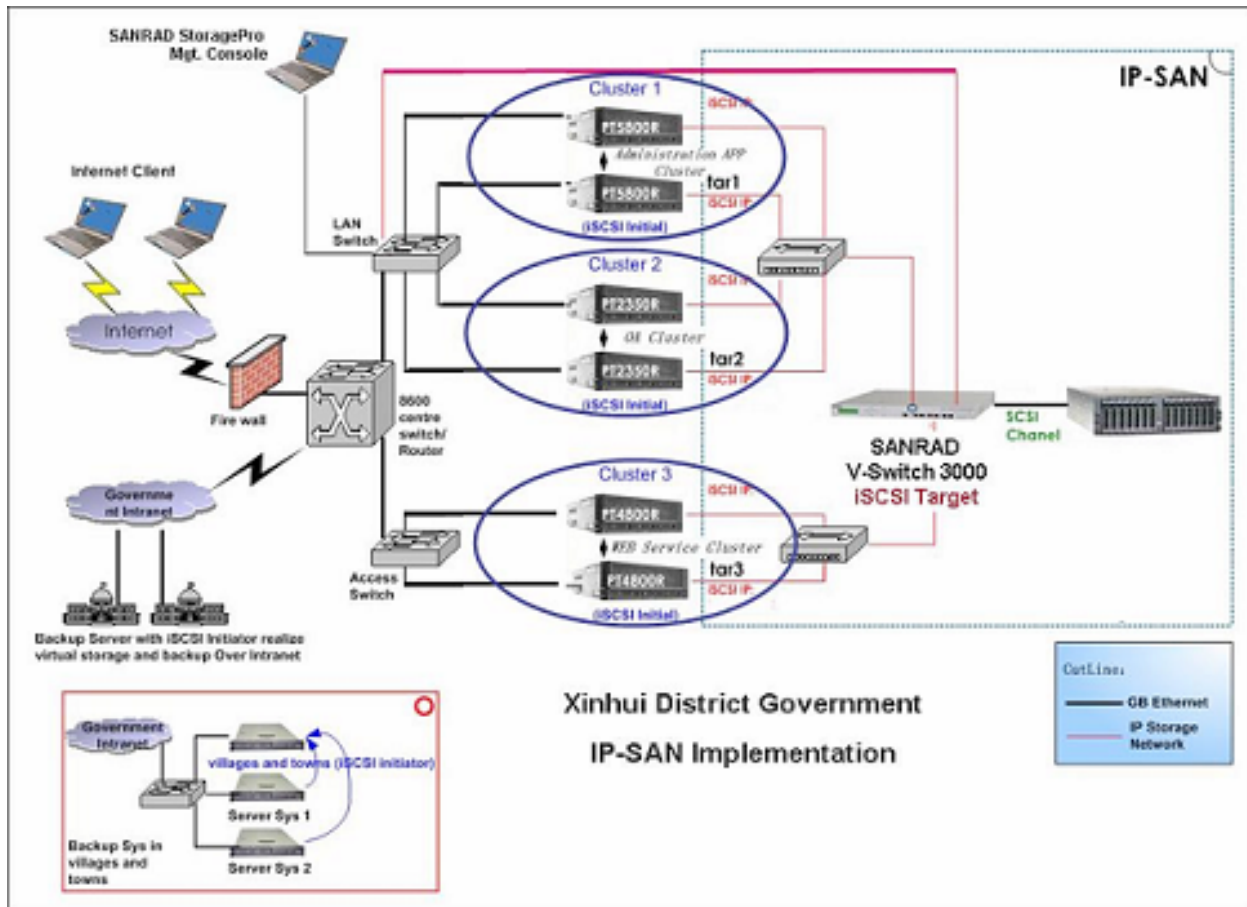
System Design & Implementation for iSCSI IP SAN

In the data center of Xinhui District, there are three sets of dual-server systems – HA clusters based on Windows 2000 Advanced Server with SQL Server Database. Each cluster serves one of three applications: Administration Verification and Approval System; Networking Office Automation System; and Public Website Server System.

It was recommended that for each storage system a centralized SANRAD iSCSI-protocol supported V-Switch 3000 be implemented as the storage switching and volume management core engine, with the PowerLeader disk-array enclosure GS4012 as the primary data storage disk system, this combination is the core storage system for the Xinhui District project.

To ensure efficiency and data security during transfer, it was necessary to install an iSCSI HBA card on the server to upload data. The Intel Pro/1000 T was selected as the iSCSI initiator and TCP off loading engine for off loading TCP translation for each of the main servers. The Intel Pro/1000 T serves critical and intelligent roles in the overall solution.

As shown in the following topology diagram, Intel's iSCSI HBA card is installed in three sets of HA cluster mode servers that comprise the iSCSI initiator side of the IP SAN infrastructure. A local LAN crosses through the standard Ethernet network and is used as a connecting port for bridging the application server connection on the host side to the Gbit port of the SANRAD V-Switch 3000. Intel's HBA card is also installed in each backup server located in the 14 villages or towns of the Xinhui district of Jiangmen City in Guangdong Province to serve as the iSCSI initiator for remote backup sessions.



iSCSI was adopted as an IETF standard in January 2000 and approved as an RFC standard in February 2003. After its first year, more than 50 well-known companies from around the world had entered the iSCSI market. A new-but-familiar storage technology, IP SANs first complemented and sometimes competed with Fibre Channel SANs. From the standpoint of the server/host, both on the application server side (Host) and the database side (Storage), it's the same network architecture – Ethernet/TCP/IP – thereby allowing the SAN solution to be started from any Ethernet or IP connection, their cables, devices and management tools. It overcomes the barriers set by the traditional SAN architectures and eliminates distance limitations. This simplified method provides an effective way to support data centers requiring off-site storage.