



## HA-AP APPLIANCE SUCCESS STORY

# Provincial Waterway Bureau (China)

## Guaranteeing Zero-downtime Continuity of Data Management Storage System

### KEY HIGHLIGHTS

**Industry:** News Media

#### The Challenge

- Support zero-downtime business continuity of data management storage system, for mission-critical applications.
- Provide high-availability access and protection of data residing on 2 Infortrend ESDS 1016REH storage systems; support 14 Windows and Linux servers, and 64 TB of data.

#### HA-AP Benefits

- Modular, clustered active-active mirroring engines, provide business-level HA solution for mission-critical applications, with dual read/write capabilities and performance.
- Continuous availability of mission-critical data for all business sub-systems.
- Affordable, high-availability, easy-to-manage business-level storage HA solution; which protects against interruption to business continuity caused by failures of FC fabric and storage systems.
- Simple, centralized administration.

#### HA-AP Versatility

- Multiple HA-AP engines can be clustered over Fibre Channel SAN to create local and/or remote mirroring protection.

## The Customer

Our case subject is a Chinese Provincial Waterway Bureau. As a branch of the Provincial Department of Transportation, it is responsible for construction, maintenance and administration of all provincial waterways, to assure safe and clear passage. To protect its privacy, our customer has requested that we write this story under a pseudo name. We honor that request and from here on out, will simply refer to it as CSWB, short for Case Study Waterway Bureau.

Based on the water systems, CSWB further sets up 16 regional water bureaus and a survey & map center. Its primary tasks include maintaining and managing all local waterways, such as waterway maintenance and remediation, dredging and reclamation, earthwork, hydraulic engineering, highway engineering, municipal engineering, water power engineering, rescue and salvage, coastal harbor and inland river waterway measurements, navigation aid settings, wharf and port waterway engineering survey and design, protection against theft and vandalism, etc.

## Background: Need for Protection and Intelligent Management of Mission-Critical Data

CSWB is at the heart of information exchange for all regional bureaus that are spread across the entire province. It supports several business sub-systems for mission-critical applications, such as Uniform Identity Authentication, Office Automation, Documentation Exchange and Documentation Management; it also serves as the window for inter-departmental communications with other provincial agencies.

As information technologies advance through the years, CSWB absorbs, adopts and progresses along the way, which makes it become increasingly dependent on the smooth operation of its IT infrastructure. Should any of its business sub-systems fail, there would be severe disruption to its daily operation.

A primary objective of its new data storage center, therefore, is to assure that the bureau's mission-critical data stays protected at all times, and is managed intelligently for optimal availability.



## SUCCESS STORY

### Guaranteeing Zero-downtime Continuity of Data Storage Center

## Challenge: Guaranteed Business Continuity and Data Protection

As we have emphasized, CSWB's business sub-systems are mission-critical applications. The safety of data lays the very foundation for its new data storage center. The project team is tasked with finding a hardware/software solution that is advanced and yet matured, safe and highly reliable, to meet the objectives of data protection and business continuity.

To accomplish these key objectives, CSWB needs an effective active-active datacenter solution – a platform that supports both round-the-clock data protection and availability.

The active-active datacenter's design must be of high availability (HA), which must be addressed at all levels, including application, host, network, and storage. A sound HA solution should deploy software-clustered hosts and virtual host technology, to ensure the availability of hosts and continuity of applications; as well as fully redundant SAN switches to ensure the availability of network paths. In addition, the storage must be enabled to deliver equivalent availability, so that an end-to-end redundancy from hosts through network to storage may be achieved.

While the applications of host virtualization and networking technologies for HA purpose have largely reached maturity, the same could not be said about storage HA. Therefore selecting a best-fit HA SAN architecture was identified as one of the key requirements for the project team.

## Solution: HA-AP-enabled Active-Active Data Storage Center

The new data storage center will transform from legacy datacenter infrastructure to cloud-based computing and storage, data protection, storage resource consolidation, and fully redundant infrastructure. The ultimate goal of the data storage center is to facilitate streamlined business practice, which requires data consolidation; while data consolidation in turn requires streamlined joint operations of storage, computing, and network resources.

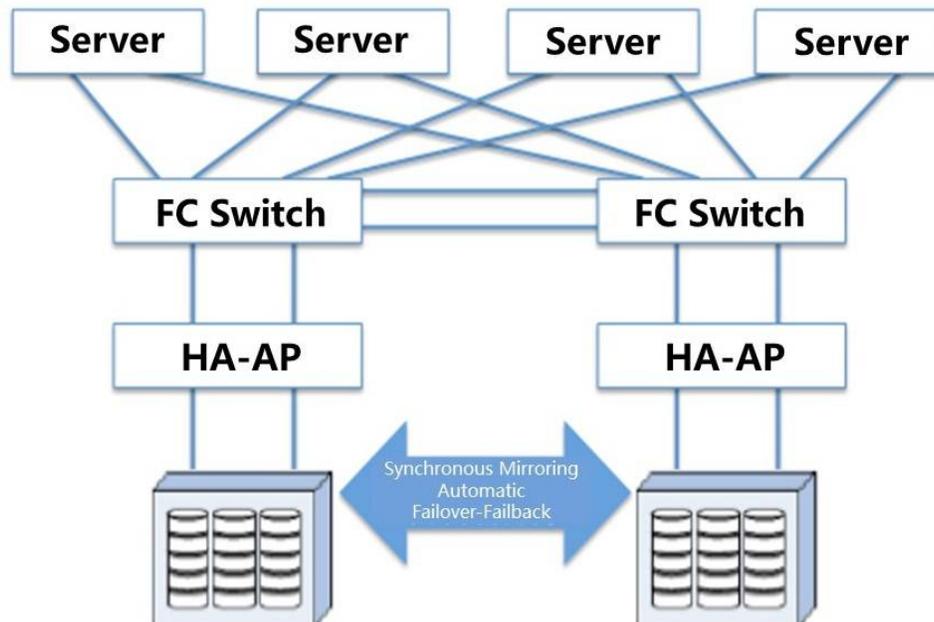


Figure 1. HA-AP Appliance Dual-engine Cluster

This requirement raises the bar for storage availability considerably. Fortunately, the project team finds that a HA-AP-enabled, fully redundant, dual active-active storage solution fits the bill perfectly. It guards against any single-point logical or physical failure, handles instantaneous failover and failback automatically without human intervention, meets high business continuity requirements, and provides mirrored data redundancy for protection.



**SUCCESS STORY**  
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of Data Storage Center



**Figure 2. HA-AP-enabled Active-Active Datacenter Configuration**

The project team further matches CSWB's requirements to the following technical advantages that the HA-AP Appliance solution has to offer:

1. Enables active-active-mirror of two, or all-active-mirror of multiple storage systems, which eliminates system downtime caused by a single-point-failure of any storage system; provides enterprise-grade data availability and business continuity protection with instantaneous automatic failover and failback upon hardware failure, while no interruption to the applications or human intervention is required. The solution meets true RPO=0 and RTO=0 requirements.
2. Supports and manages heterogeneous storage systems of different brands and models.
3. Requires no agent or driver software on the servers, additional servers can be added by simple configuration update, which makes the solution a lot more open and desirable for future system expansion.
4. Supports all mainstream applications and operating systems, including Windows, Linux, UNIX system platforms; also server virtualization solutions such as VMware, CITRIX, HYPER-V, and KVM.

The project team comes to the conclusion that, the Loxoll HA-AP Appliance would fully satisfy CSWB's objectives. With that decision, all pieces of the HA solution are then in their right places. The complete system structural design includes the following major components:

- Two Infortrend ESDS 1016REH storage systems at the back-end, each with 4TB x16 capacity enterprise-grade NL-SAS hard drives.
- Two Brocade 300 enterprise-grade FC switches connect with the storage systems to provide the backbones of the HA SAN
- 14 Windows/Linux servers
- A clustered 2-engine Loxoll HA-AP Appliance connecting the front and back ends



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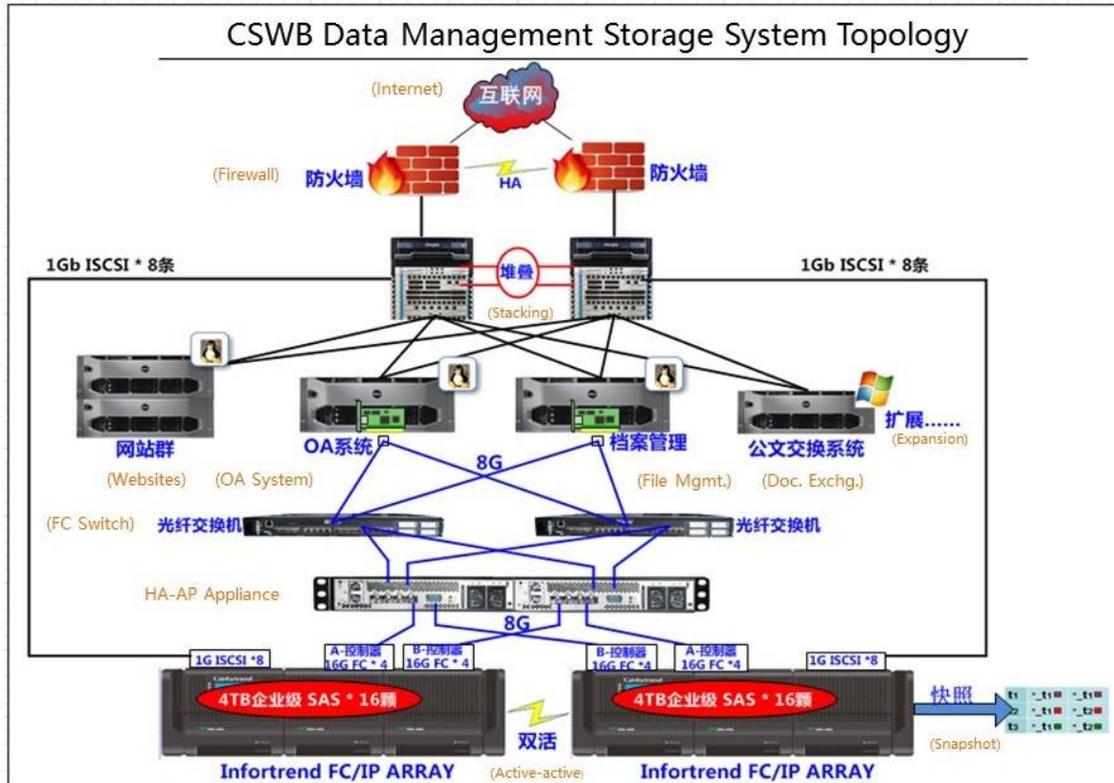


Figure 3. Data Management Storage System Topology Diagram

**Benefits: Zero-downtime Business Continuity & High Data Safety**

When the CSWB data management storage center completed, the storage system for the entire datacenter became fully redundant, with complete single-point failure protection, i.e., any single-point of failure will trigger automatic failover instantaneously. This assures data access for all CSWB business sub-systems, which ultimately supports 7\*24\*365 business continuity.

The SI's manager-in-charge, Mr. Wang Xu, commented: "The Loxoll HA-AP Appliance is a very affordable, high price-performance value HA SAN solution. In addition to guaranteeing zero-downtime business continuity for our customers, its inherent full redundancy design also lends itself to data protection so naturally. We strongly recommend this solution to any customer that has the need for business continuity and data protection."