# i2Move Technology White Paper

**SHANGHAI INFORMATION2 SOFTWARE INC.**

REV 01

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# SHANGHAI INFORMATION2 SOFTWARE INC.

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# Preamble

## Summarize

This document introduces the architecture, principles, functions and usage scenarios of i2FFO products.

## Target readers

This document applies to Information2 certified engineers.

## Symbolic Convention

The following flags may appear in this document, and what they represent is listed below.

| Symbolic | Clarification |
| --- | --- |
|  | Used to warn of potentially hazardous situations that, if not avoided, could result in death or serious personal injury from hardware devices and unrecoverable damage or loss of system files from software. |
|  | Used to warn of potentially hazardous situations that, if not avoided, may result in moderate or minor personal injury from hardware devices. Software may result in system file corruption or loss, which can be recovered. |
|  | Used to convey equipment or environmental safety warning messages that, if not avoided, may result in equipment damage, data loss, reduced equipment performance, or other unforeseen results. |
|  | Used to highlight important/critical information, best practices, tips, etc. |

# Revision History

The revision history accumulates a description of each document update. The latest version of a document contains updates from all previous document versions.

| Revision date | Version | Description |
|---|---|---|
| 2020.07.08 | REV 01 | First Release |
| | | |

# Contents

# Preamble

SHANGHAI INFORMATION2 SOFTWARE INC. ("Information2") is a basic software company focusing on data replication. It is committed to the research and development and promotion of dynamic file replication, database replication and other technologies, and its products are widely used in the fields of disaster recovery versus backup, data protection, and cloud data management to ensure data security and business continuity of enterprises.

In the past ten years, Information2 aims to empower enterprises to change the traditional way of data and business protection, provide customers with efficient, convenient and competitive products and consulting services in the fields of disaster recovery versus backup, big data management, file sharing and cloud services, and cooperate with ecological partners in an open attitude to escort users on the road of digital transformation.

We adhere to the values of passion, dedication, integrity and diligence, release organizational vitality, stimulate individual potential, independent research and development, focus on customer needs, continue to create value for customers, and promote the continuous development of the digital world.

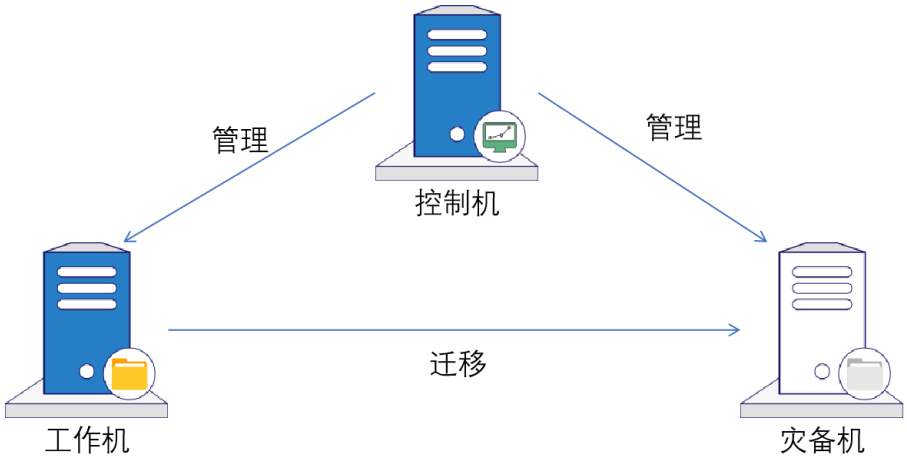
This article mainly introduces the i2Move product architecture, principles, functions and use scenarios.

# 1 Product Overview

## 1.1 Product Introduction

i2Move online hot migration software simplifies migration. One-click migration of operating systems, applications and user data without downtime; predictable migration time and seamless switchover to a new host machine upon completion.

## 1.2 Product Architecture




## 1.3 Product Features

The advantages and features of i2Move products are as follows:

**Hardware-independent migration**

i2Move works at the operating system layer, based on real-time data replication and hardware-agnostic switching technology, to flexibly migrate the entire operating system (registry, root directory, system patches, etc.) to different models or different configurations of servers.

**Non-stop migration of operations**

i2Move starts system mirroring to replicate data to the disaster recovery versus backup server, and normal production of the business system is not affected; after the completion of mirroring, all incremental business data are automatically replicated to the disaster recovery versus backup server, and switching is carried out after validation.

**Migration without distance limitation**

i2Move supports network speed limitation and data compression, and transmits data to disaster recovery versus backup server through IP network; it supports breakpoint transmission and encrypted transmission.

**Support migration of heterogeneous platforms**

Supports migration between physical and virtual machines, P2V (physical machine to virtual machine), V2V (virtual machine to virtual machine), V2P (virtual machine to physical machine), P2P (physical machine to physical machine).

# 2 Functional Features

## 2.1 Byte-Level Migration Principle

Byte-level real-time replication technology is used to copy system files from the source to the I2FFO directory on the target, and the target directory is directly overwritten during migration.

## 2.2 Block-Level Migration Principles

Direct disk-to-disk replication is accomplished using block-level real-time replication technology.

## 2.3 Data Validation

Data mirroring process supports checksums to improve file synchronization efficiency when re-mirroring in order to quickly enter the replication state.

Data mirroring supports the following types of checksums:

- Always strict checksum: do strict checksum and differential mirroring for each file.
- Time validation, inconsistent then strict checksum: first do time validation, if consistent then compare the next file, if inconsistent do strict checksum and differential mirroring. This option does not allow to enable CDP function.

## 2.4 Network Transmission Features

### 2.4.1 Encrypted Transmission

Support data encryption during network transmission, support AES, SM4 encryption algorithms to ensure the security of data transmission.

### 2.4.2 Compressed Transmission

Supports data compression during network transmission, with compression levels including Extreme Compression, Normal Compression, Fast Compression, and Equalized Compression for selection.

### 2.4.3 Bandwidth Control

Supports bandwidth control, which can control the transmission rate in different time periods to prevent the impact on business performance during peak business periods.

### 2.4.4 Heterogeneous Platform Support

Supports migration between physical and virtual machines, P2V (physical machine to virtual machine), V2V (virtual machine to virtual machine), V2P (virtual machine to physical machine), P2P (physical machine to physical machine).

# 3 Application Scenarios

## 3.1 Hardware Upgrades and Modifications

Hardware upgrades, non-stop migration of business systems

Server room relocation, server consolidation, business system migrationd

## 3.2 Virtualization Construction and Management

Physical Machine to Virtualization Platform Migration

Migration between heterogeneous virtualization platforms

## 3.3 Cloud Hosting Migration

Rapid application or system uploading and downloading to the cloud

Migration of applications or systems to heterogeneous cloud platforms

## 3.4 Disaster Recovery Protection and Operational Testing

Rapid setup of business test environments

Rapid rebuild of off-site disaster recovery system

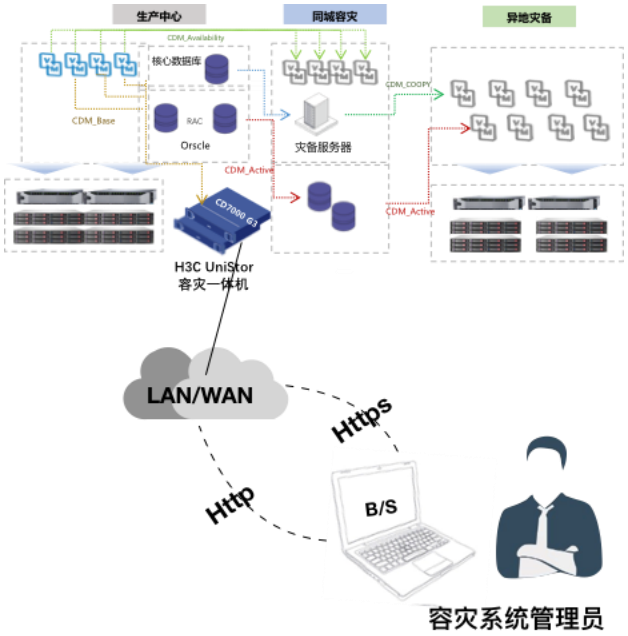
# 4 Unified Data Management Platform

## 4.1 Platform Introduction

The unified data management platform integrates i2Move and other products, including multi-dimensional big data management functions such as data monitoring, disaster recovery versus backup, migration, synchronization, distribution, sharing, integration, governance, archiving, and so on, for physical machines, virtualization and cloud environments. It can help users realize highly efficient and intelligent data management work, making a software operation interface and comprehensively mastering enterprise information lifeline.

## 4.2 Access Architecture

The unified management platform provides B/S access, and disaster recovery system administrators can interoperate with H3C UniStor CD disaster recovery MFPs through LAN/WAN networks, and realize disaster recovery MFP configuration and management through the Web interface of the management computer's browser, as long as they can access the console management center through the browser to carry out relevant management work.




The access protocol supports both http and https protocols, and disaster recovery administrators can easily create and monitor the execution of jobs in the disaster recovery MFP through remote access, and realize local copy management, real-time data disaster recovery versus backup, application-level high availability, and database synchronization management through a unified interface to achieve comprehensive protection of application-level disaster recovery in two places and three centers.

## 4.3 Modular Management

All functions adopt modular design, including data-level backup, data-level disaster recovery, application-level disaster recovery, system-level backup, virtualization platform disaster recovery versus backup, cloud platform disaster recovery versus backup, system-level migration, database disaster recovery, database dual-activation, and modular management architecture for data management, and modules can be quickly decoupled, combined, installed and maintained. In the unified data management platform, users with different usage requirements only need to focus on using the corresponding protection module, and do not need to pay attention to the underlying layer.

## 4.4 Rights Management

The Unified Data Management Platform adopts the RBAC model for user rights management, Role-Based Access Control (RBAC), where rights are associated with roles and users inherit the rights of the current role by becoming a member of a role. Roles are created to accomplish a variety of tasks, and users are assigned roles based on their responsibilities and qualifications, and users can easily be assigned from one role to another. Users can be easily assigned from one role to another. Roles can be assigned new permissions based on new requirements, and permissions can be reclaimed from a role as needed.

Simply put, a user has a number of roles, and each role has a number of permissions. This constitutes a "user-role-permission" authorization model. In this model, between users and roles, between roles and permissions, there is generally a many-to-many relationship, except for some of the system's built-in restricted permissions.

The following types of users are built-in by default:

System administrator (login name: sysadmin): add, delete and change users, user rights management.

Business Administrator (login: admin): Administrator of business-related operations.

Business operator (login name: operator): with business operation rights, the system administrator needs to authorize different functional modules, the built-in operator user role default only resource-related operation rights, such as the need for more permissions, see the role management.

Auditor (login name: auditor): You can view the operation log of the system.

System administrators, business administrators, and auditors form the three branches of authority required by the relevant industry to meet safety regulations.

## 4.5 System Monitor

The unified management platform provides system monitoring function, which monitors the rule task execution, alarms, storage resource usage, client host access and other information in the system around the clock.

The monitoring information is presented in graphical and tabular forms, so users can intuitively understand the real-time situation of rules and resources, which greatly reduces the difficulty of operation and maintenance management in the enterprise.

## 4.6 Alarm Notification

The unified management platform provides alarm notification function. Users can set alarm conditions in advance. When the system running status reaches the specified conditions, an alarm will be triggered and the content of the alarm will be notified to the relevant users in a specified way, and at the same time, the content of this alarm will be saved in the record. Through the alarm function, it is convenient for system administrators to know the system operation status in time and for operators to know the task operation status in time. When an abnormality occurs in the system or task, through the alarm display or alarm e-mail notification, users can take timely countermeasures to avoid risks.

The unified management platform provides email interface and SMS interface, which users can choose as the alarm notification platform as needed. The SMS platform currently supports the AliCloud SMS platform, Huawei message notification service, ESK platform (enterprise letter king), SMS cat and so on.

## 4.7 Statistical Reports

The unified data management platform provides statistical report function, utilizing the relevant information recorded in the platform, the user selects the data items that need to be counted, and the system will automatically generate statistical reports according to the content selected by the user, and set the period and time to send them to the designated receiving mailbox.

For the report data generated from backup, the platform provides a report download function. After the user clicks download, the report will be automatically downloaded to the local area in CSV file format.

## 4.8 Metadata Backup

In order to ensure that the unified management platform can continue to work normally after a disaster occurs, it provides a backup recovery function for the controller configuration to ensure that the controller can be recovered by the controller configuration backup data in the event of a failure, or the controller configuration backup data can be transferred to a new server, and the controller configuration backup data is recoverable and replicable.