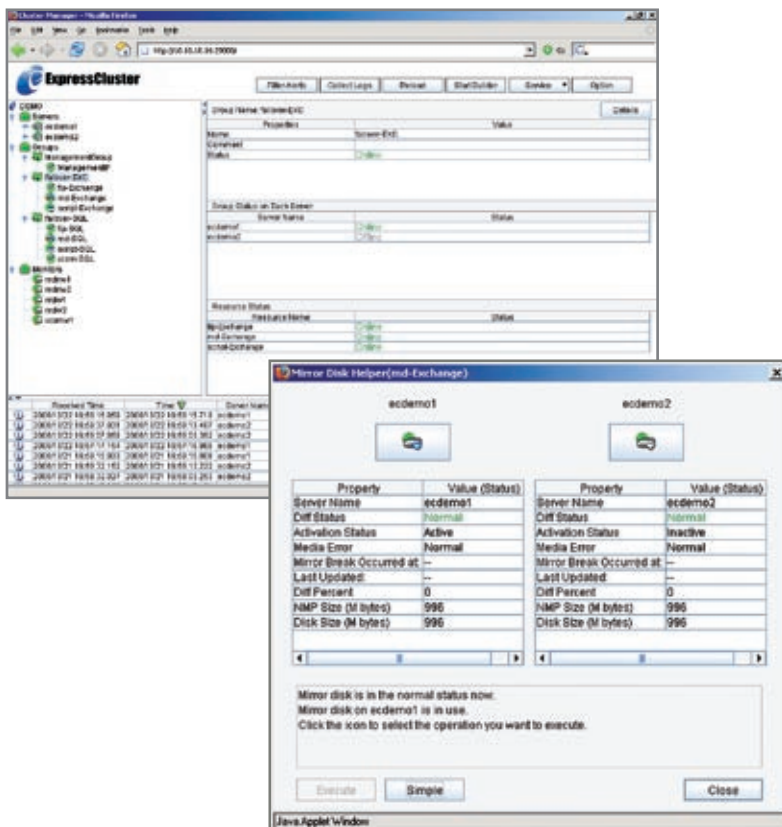




NEC ExpressCluster® X WAN Edition



- Continuous integrated protection for applications and data with fast and easy recovery
- Synchronous/asynchronous data mirroring enables flexible data protection
- Low-cost WAN support reduces total cost of ownership for disaster recovery solutions

ULTIMATE INTEGRATED DISASTER RECOVERY SOLUTION

ExpressCluster® X WAN is the next generation, integrated disaster recovery solution with the unique ability to provide continuous protection of critical applications and data with near-instant recovery across wide area networks, spanning hundreds of miles. It is built on a completely new technology foundation that further enhances the award-winning and field-proven ExpressCluster technology foundation that has been helping customers worldwide maintain critical system continuity since 1996.

This new edition is a powerful disaster recovery solution for business critical systems including applications and data. It ensures near-instant recovery of critical applications and data after a primary system or site failure, with full data protection over conventional cost-effective wide area network infrastructures.

Support for Server Applications

- Microsoft® Exchange Standard & Enterprise editions
- Microsoft SQL Server Standard & Enterprise editions
- Oracle® DB 9i/10g Standard & Enterprise editions
- IBM® DB2® Standard & Enterprise editions

Unlike other solutions, ExpressCluster X dramatically simplifies the recovery process and significantly reduces maintenance and operational costs. With its intuitive pure Web management GUI and remote management capabilities, administrators benefit from streamlined cluster control and improved visibility. Enhanced monitoring agents for databases, Web servers and network services are also available. By streamlining deployment and management of clustering solutions, it significantly reduces total cost of ownership while dramatically improving critical applications and data availability and accessibility.

COMPREHENSIVE PROTECTION FOR APPLICATIONS AND DATA

This next generation software provides protection for all standard applications and data. Standard applications such as database servers and applications, Web servers, and enterprise server applications are supported without requiring source code changes or specially designed cluster-aware versions.

Standard data repositories such as file and databases stored on conventional disks are also readily supported without requiring data format changes.

RAPID FAILURE DETECTION AND DISASTER RECOVERY

ExpressCluster X recovers all data committed to the primary system disk without loss should a primary application, system, or site outage occur. Using either a periodic network request or heartbeat signal, it automatically executes recovery procedures if a system fails to receive required heartbeat signals from another system. It can detect application and resource (e.g. disk) failures and trigger appropriate recovery action including failover to the standby system. In the failover process, the standby system takes over the virtual host identity from the primary system so client systems that range from hundreds to thousands can easily continue or re-establish access to target applications without manual reconfiguration. In addition, all application processes and resources are activated on the standby system so business critical applications and data are recovered within minutes instead of hours or days.

Once a failed system is detected and repaired, the system can automatically restore itself to its normal ExpressCluster operating state without manual intervention. Administrators can also customize tasks such as system startup, processing, recovery/failure and resource reallocation based on business requirements.

Key Features

- Synchronous/asynchronous data mirroring support allows ease in choosing between full data protection and minimum network complexity
- Microsoft Exchange Standard Edition support lowers MS Exchange email continuity cost of ownership
- Pure Web-based management console further simplifies management
- Fine disk mirroring configuration support further reduces disk requirements
- New resource level reduces potential downtime for maintenance and configuration

FLEXIBLE DATA MIRRORING FOR ALL CRITICAL DATA PROTECTION NEEDS

ExpressCluster® X allows users to easily choose between synchronous and asynchronous data mirroring modes to meet a wide range of data protection needs.

Synchronous data mirroring technology enables full data protection by ensuring data written to the mirrored disk on the primary system is also written to the mirrored disk on the standby system in real-time as a single transaction. Under normal operating conditions, applications will only see successful data write operations if the data has been successfully written to both the primary and standby systems. If the standby server is unavailable (e.g. maintenance), ExpressCluster will allow write operations to complete on the primary system but all changes will be tracked. When the standby system becomes available again, it will be quickly resynchronized with the primary system via ExpressCluster's FastSync feature where only the changed data are mirrored.

Using synchronous mirroring technology, ExpressCluster X ensures no data committed to the mirrored disk on the primary system is dropped and no data is lost—if a failure occurs, users can readily access an up-to-date exact copy of all data on the standby system.

Although synchronous data mirroring offers the highest level of data protection, there are some situations where such capability is not strictly required because some data loss is acceptable. In such situations, the asynchronous data mirroring capability could be used to further simplify network requirements.

Asynchronous data mirroring differs from synchronous data mirroring by allowing data write operations to complete to the mirrored disk on the primary system without verifying data write completion on the standby system. Instead, data write operations to the standby system will be performed on a best effort basis. This depends on system and network conditions with the risk that some data will be lost if the primary system fails before the write operations to the standby system can be performed.

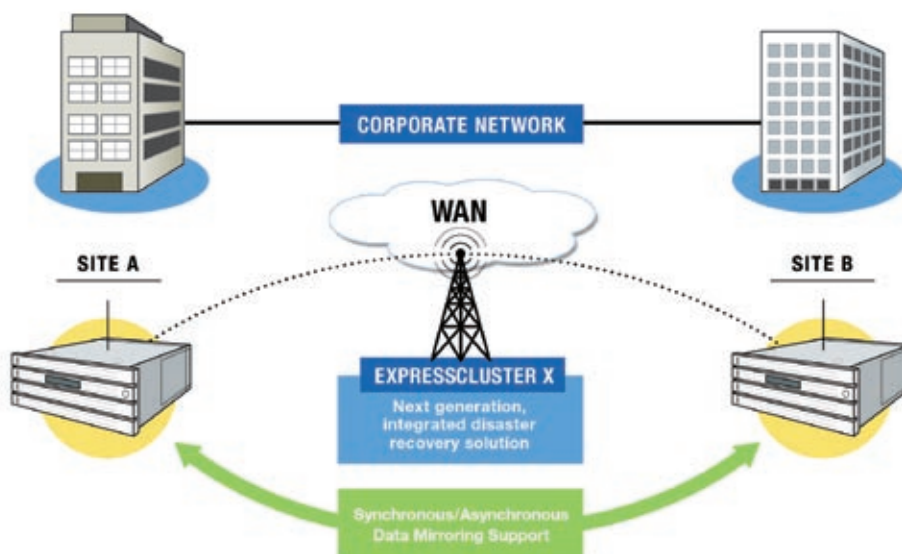
Depending on specific user data protection needs, it supports a combination of different mirrored disks using synchronous and asynchronous data mirroring in the same cluster. Also, unlike other solutions, it allows users to easily change between synchronous and asynchronous mirroring.

EASY WORKLOAD MIGRATION MITIGATES PLANNED MAINTENANCE DOWNTIME

ExpressCluster X enables users to execute software and hardware maintenance that require system reboot with minimum service outage. By manually moving application workload to a different system, maintenance on a system can be performed without disrupting operations, so that critical business processes continue nonstop.

FLEXIBLE PLATFORM AND SOFTWARE SUPPORT

The software supports general purpose Intel® x86 compatible servers and NEC's Express5800/ft series of servers running industry-standard operating systems. In addition, standard versions of popular server applications including database servers, application servers, Web servers, and email servers are supported for reduced cost of ownership.



WORLD-CLASS SERVICES AND SUPPORT

NEC is committed to providing the best service and support with ExpressCluster® X WAN Edition to ensure the proper solution design and deployment. In addition, NEC offers a full range of support options:

System Requirements

At least 2 servers are required for each cluster and each server must meet the following requirements:

CPU

- Intel 32-bit x86 1GHz or faster CPU

Memory

- 30 MB available memory

Disk

- 80 MB available minimum OS boot disk and 1 or more additional data disks

Network Interface

- 2 or more 100 Mbps or faster network interface cards

Operating System

- Windows® 2000 Server (Standard or Advanced), Windows Server 2003 (Standard or Enterprise)

Network Requirements

The network connecting 2 servers must meet the following requirements:

Cluster Interconnect Network

- 1 IP network between servers
- For synchronous disk mirroring, maximum network round-trip latency between servers of 70ms or less
- For asynchronous disk mirroring, maximum network round-trip latency must be low enough to support sustained disk data write rate
- For synchronous disk mirroring, minimum available bandwidth of 1.5Mbps or more
- For asynchronous disk mirroring, minimum available bandwidth must be high enough to support sustained disk data change rate

Cluster Public Network

- 1 IP network segment between servers

Available Options

The following add-on options are available:

Database Agent

- Proactively monitor proper functional state of database servers and trigger recovery in case of malfunction.

Internet Server Agent

- Proactively monitor proper functional state of Web and email servers and trigger recovery in case of malfunction

FOR MORE INFORMATION

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