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## Simplified High Availability for Critical LAN Systems

Successful business operations depend on reliable access to critical applications and data. High availability is essential for IT systems running standard database servers, enterprise applications, and email servers that are required to sustain the necessary productivity of key business operations and processes. NEC ExpressCluster® X is an integrated high availability software solution that provides fast application recovery and synchronous data mirroring to protect critical standalone systems against unexpected hardware and software failures. It also addresses planned system maintenance downtime with minimum requirements for additional server, storage, and network hardware resources.

## Fast Application Recovery Minimizes System Downtime

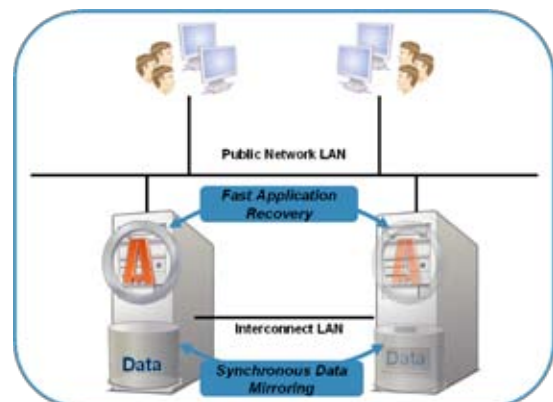
ExpressCluster X provides continuous monitoring of applications and system resources such as disk and network I/O for failure on the primary and standby servers to ensure maximum reliability. When a failure is detected, the target applications and dependent resources are quickly recovered on the standby server within minutes, instead of hours or days. Once a failed server is repaired or replaced, the system can be quickly restored to the normal operating condition. It provides flexible configuration options to allow administrators to customize resource monitoring and recovery policies.

## At a Glance

NEC's ExpressCluster X is an easy and low-cost high availability software solution for standalone systems running critical applications and data. It provides granular application failure detection and synchronous data mirroring to enable fast recovery in LAN environment.

## Benefits:

- » Fast automated recovery against hardware and software failures minimizes unplanned downtime.
- » Support for low cost standard applications and hardware minimizes total cost of ownership.
- » Easy application and data workload migration minimizes planned downtime.



## Synchronous Data Mirroring Closes the Data Loss Gap

NEC's proven synchronous data mirroring technology provides continuous and full protection of critical data against system failures. This is done by ensuring any data change stored to the primary server disk storage is also stored to the standby server storage at the same time. There is no gap during which data could be lost due to delay in copying data from the primary server to the standby server. Moreover, ExpressCluster X data mirroring works with standard internal and external storage hardware, thus eliminating the need for expensive proprietary SAN storage hardware traditionally required for synchronous data mirroring.

## Virtual Server Identity Ensures Practical Usability

The built-in support for virtual server identity enables each group of applications and related resources to maintain its own server identity independent of the static server identity assigned to each physical server. Client systems do not need to be reconfigured to reconnect to the target applications and data since the virtual server identity is automatically assigned to the active physical server. This eliminates the need to reconfigure potentially tens of thousands of client systems. And by retaining the static physical server identities, all servers can remain accessible in the same network environment for management and testing purposes. It also enables practical usage of active/active configuration where all physical servers are configured to support different production workloads while serving as standby server for each other.

## Integrated Application and Data Protection for Cost Savings

ExpressCluster X eliminates the need for complex system integration of multiple products to achieve integrated application and data protection and recovery. It also has a unified web management console that provides a single intuitive tool for operators to monitor and quickly get the overall health status of target applications and data resources.

## No-Hassle Planned Maintenance

To reduce planned downtime scheduled for routine application or OS patches, ExpressCluster X enables administrators to efficiently execute the maintenance tasks that normally require system reboot with minimal overall system outage. By easily moving application and data workloads to a standby server, the critical business operations and processes can continue without noticeable disruption.

### Key Features

- » Granular application failure detection & fast recovery over LAN
- » High speed synchronous data mirroring over LAN
- » Easy on-demand application and data workload failover/failback
- » FastSync resynchronization of only changed data
- » Support for low cost standard application and OS versions
- » Data mirroring support for standard internal disks

System Requirements	Network Requirements	Available Options
<p>2 servers are required for each cluster and each server must meet the following requirements:</p> <p><b>CPU &amp; Memory</b></p> <ul style="list-style-type: none"> <li>• 32-bit system: Intel x86 compatible 32-bit 1GHz or faster CPU</li> <li>• 64-bit system: Intel EM64T compatible 64-bit 1GHz or faster CPU</li> <li>• 128 MB available minimum</li> </ul> <p><b>Disk &amp; Network Interface</b></p> <ul style="list-style-type: none"> <li>• 80 MB available minimum OS boot disk and 1 or more additional data disks</li> <li>• 2 or more 100Mbps or faster network interface cards</li> </ul> <p><b>Operating System</b></p> <ul style="list-style-type: none"> <li>• Windows Server 2003/2008 (Standard or Enterprise)</li> <li>• Red Hat Enterprise Linux 4/5</li> <li>• Novell SUSE Linux Enterprise Server 9/10</li> </ul>	<p>The network connecting all cluster servers must meet the following requirements:</p> <p><b>Cluster Interconnect Network</b></p> <ul style="list-style-type: none"> <li>• 1 IP network between servers</li> <li>• Maximum network round-trip latency between servers of 10ms or less</li> <li>• Minimum available bandwidth of 100Mbps or more</li> </ul> <p><b>Cluster Public Network</b></p> <ul style="list-style-type: none"> <li>• 1 IP network between servers</li> </ul>	<p>The following add-on options are available:</p> <p><b>Database Agent</b></p> <ul style="list-style-type: none"> <li>• Proactively monitor proper functional state of database servers and trigger recovery in case of malfunction.</li> </ul> <p><b>Internet Server Monitor</b></p> <ul style="list-style-type: none"> <li>• Proactively monitor proper functional state of web and e-mail servers and trigger recovery in case of malfunction</li> </ul>

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