

(19) (KR)  
(12) (B1)

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(11)  
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2004 03 18  
10-0423687  
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(21) 10-2001-0044036  
(22) 2001 07 21

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(43)

10-2002-0010490  
2002 02 04

(30) 00116453.2 2000 07 28 EP(EP)

(73) 10504

(72) ,  
-55118 1  
  
,  
-55442 9  
  
,  
-52224 35

(74)  
:

(54)

가

가

1 DMApi  
 2  
 3  
 4 (time chart) 3  
 5  
 6  
 < >  
 100 :  
 110 : DM  
 130 : DMApi  
 140 :  
 150 : 3  
 160 :  
 170 :  
 200 :  
 210 : (SDR)  
 220 : SP (GS)  
 230, 240, 250 :  
 300 :  
 310, 320 :  
 340 :

(clustered information technology environment)  
 (data storage resources)  
 (loosely coupled node cluster) (shared disk file system)  
 (failover recovery) (handling)  
 (large computing environments) (networked)  
 (distributed file system) (high-resolution images), (input/output) (I/O)  
 (functionality)  
 (mass storage systems) (capacity)  
 (storage-intensive) (cost-effective)  
 (access)  
 가

(DATA Management(DM) application)  
 DM 가 (on-line) 3 (tertiary storage archive)  
 (semantics) , DM 3 (administrative operation) 가 , DM (archived data) (data file)  
 DM (monitoring facilities)  
 (remote storage device) (local storage space)  
 (HSM: Hierarchical Storage Management)

(storage management) (transparent) , 가 (local)

(file-based) HSM DM (file attributes) 가 (

place holders) (stub files) ( ) ( )

(correspondingly punched disk region(s)), ( )

(recall) HSM (rarely accessed data)(

) (file server)

가 (failure storage system) (service) (take over)

(availability), (failover)

( ) , DM

AIX SP (UNIX-based Scalable Power Parallel File System)

( (GPFS: General Parallel File System) (multiple host

machines) . DM

(implemented) (DM)

(DMApi: Data Managem

ent Application Interface)(Data Management Interfaces Group (DMIG) )가 .

- (HSM)

- (backup) (restore)

DMApi (robust), (commercial-grade) DM

(object) (stateful control) DMApi DM (crash recovery)

DM (support)

(synchronous) (asynchronous)

DMApi (events) . DMApi

(operating system) DM

(mechanism) , DMApi (sessions) (sin

gle point) . DMApi DM

tion channels) DMApi (Kernel component) (primary communica

/ (one-node/computer)

(cluster environment) ( )

가 DM (reside) , (stabbed)

(active) (process) (inter

rupt) DM HSM (intial node failure)

가

DMApi HSM 가

(subj

ect matter) (candidate)

(configuration information) , (f

ailure information) (message information)

(analyzing) , 가

(updating) 가 가

(request) (recognize) , 가

(trigger) 가 가

, DMApi DM (cascaded failover) 가  
 ( ) (RAM) (independence)  
 (node-to-node communication) (hardware side) (high-speed interconnec  
 tion) (monolithic) ( ) (synchronization)  
 S 가 가 (mutexes) (synchronized locking)  
 S 2 (alternative object) (  
 simulating) (stubbed files) (access-guarantee) (subset)  
 , 1 가  
 , 2  
 , 가  
 1 ( ) (non-resident file) DMApi (D  
 MApi model data flow) 가 DM (110) (100)  
 (secondary storage) (magnetic disk) (local disk) 2  
 가 (120) (100) , DMApi (130)  
 (remote node)(140) , 가 3  
 (150) (infrequently accessed data) .3  
 (150) (robotic tape library) (optical disk aut  
 ochanger) , 2 3 (150)  
 (160) (data migration) , 가 , 3 (150)  
 (resident data) (local change) 3 가 (invalid  
 date) . 3 가 DMApi  
 3 (150) , DM (110)  
 (managed region) (set) DMApi , (bypas  
 sing) , " (under cover)" ( )  
 I/O(invisible I/O) , ,  
 (timestamps) , (2) (2) (calls)  
 3 (150) , DM (110) (target file)  
 (rights) 가 . (dedicated) DMApi ,  
 ment)가 ( (data hole) ) . DM (seg  
 , DM (110) , (mounting)  
 (a set of) DM 가 (out-of-space notification)  
 / / (read/write/truncate access)  
 spend) (170) (-> ) DMApi (su  
 (queue) DM (disposition) 가 DM  
 (Tivoli Space Manager) (reactivate) ( (unblock))  
 HSM ( )  
 70%) , DM (dae  
 mon) (lower threshold) (eligible)

2 4- (200) 2 "/gpfs1" (1,3) (2)  
 (General Parallel File System) (GPFS) DM (4)  
 ( IBM AIX SP (system data repository)"(SDR)(  
 210) (track) (defined group of nodes) (  
 ) (protocol) SP (SP Group Servi  
 ce)(220) (200) (200) SDR(210) (230 250)  
 - (200)  
 - 가  
 - 가  
 가, ( instance) (AIX SP (management group)  
 API (architecture) ( )  
 (client) (SP GS (member) AIX SP GS (event-driven) (-> (call  
 back function)) DM ( )  
 ( SP GS) DM  
 (210) 가 (pr  
 ocedure)  
 1. : -  
 2. : 가  
 3. : 가 가 (200)가 ( , IBM SP  
 ) 가  
 a)  
 b) 3 1 2 4- (commu  
 nication-based) DM (310,320) (backgr  
 ound) (install) 가 (310,320,350) (backgr  
 (sleeping) (310,320) (330) (priority key)(340) ( (workload)(360) ) (com  
 mand interface) (blocking mechanism) SDR (com  
 (persistent) (modify) (atomic operation)  
 (check) HSM (lock)( )  
 가 IF - THEN  
 if(lock==0) then {lock = 1}  
 (caller)  
 old) (specific) 가 가 가 (h  
 60 가 60 )

UNIX HSM (uptime) (zero) 15  
가 (380)  
phase) (timeout)(370) 가 HSM (380) (start up) (voting HSM DMApi (ma  
sk) 가 ( ) (incoming event) (consistency) (race condition) (ma  
( ) 가 (sleeping backup) HSM  
(match) 가 가 가  
(multi-phase handshake mechanism)  
가 ( )  
4 (vote) 가 ( )  
3 가  
가  
3  
(DM)  
DMApi 가 DM (existing) DMApi  
(pending) DMApi 가, DMApi  
5 가 GPFS HSM DMApi GPFS ( )  
DM (concurrent thread) 가  
(queueing) (busy waiting)  
(single threaded environment) FIFO  
(conditional variables)  
6 IBM SP AIX GPFS HSM  
SP (cluster-wide)  
(GS)(600) (SDR)(610)  
SP 가, (-> )  
(life status) -  
AIX SP GPFS HSM  
- dsmwatchd(620,630,640): / (focal point)  
- dsmrecaId(680,690,700):  
- dsmmonitord(650,660,670):  
3가  
dsmwatchd  
S (DM )(720) dsmmonitord  
dsmrecaId  
S 가 (corrupted) (GPFS /  
(crash/shutdown), 가 HSM )

(730)  
 1 , dsmwatchd가 DM 가 (up) dsmrecaIID가  
 DM dsmrecaIID " (ping)" dsmwatchd가 dsmrecaIID  
 가 PID가  
 2 , SP ID (GS) GS  
 (queued)

(request) (trigger)

(57)

1.

(loosely coupled nodes)  
 (failover)

2.

1

2.

3.

1

4.

1

5.

1

6.

5

7.

1

8.

(priority key)

(locking mechanism)

m code means)

가 (computer usable medium) (computer readable progra  
 가

가  
가

9.

가

10.

9 2 1 가

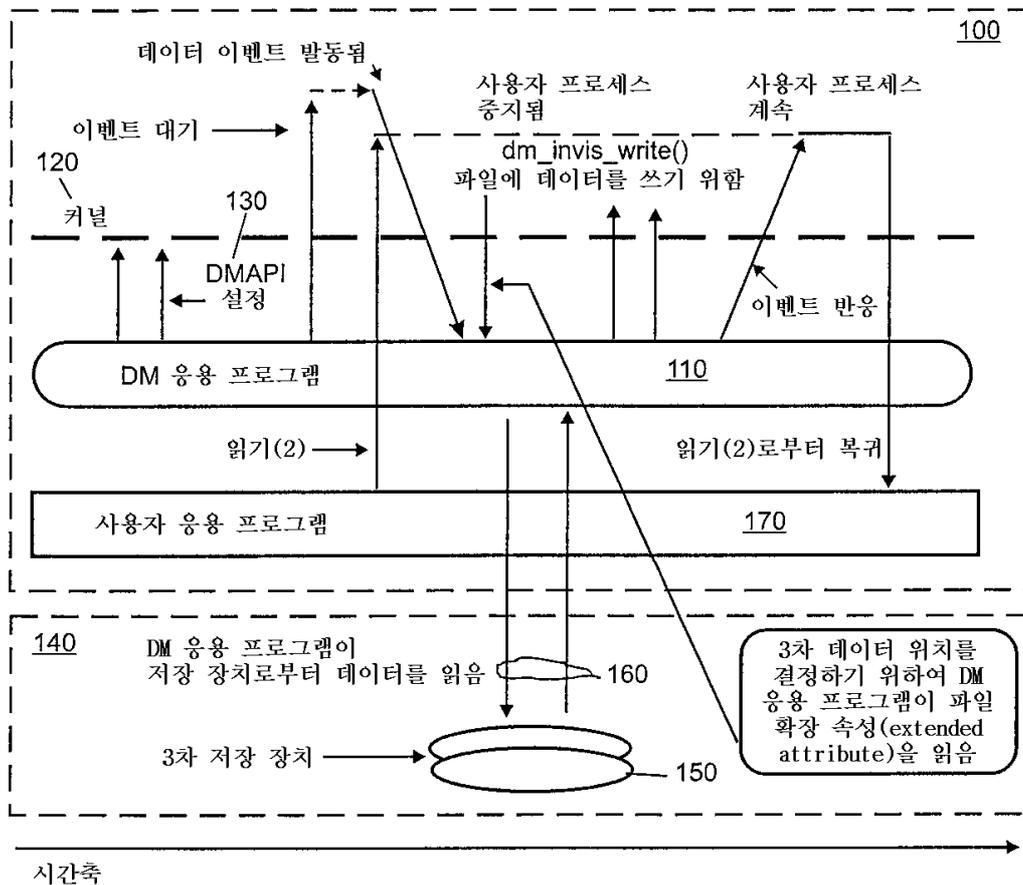
(cascading)

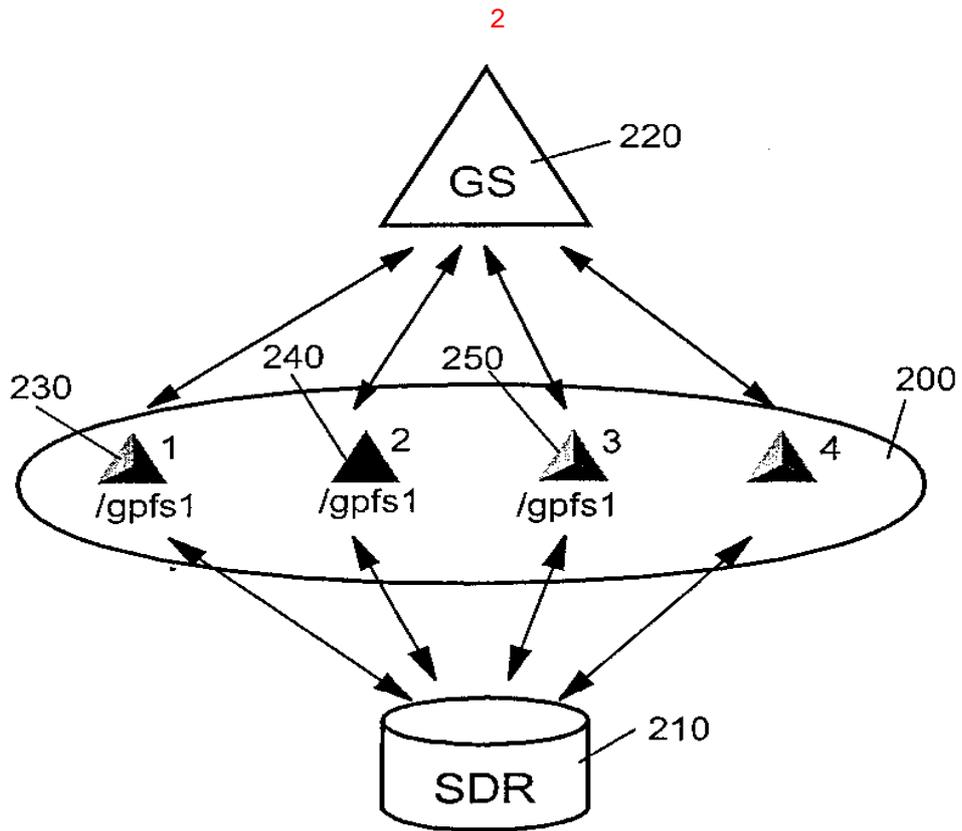
11.

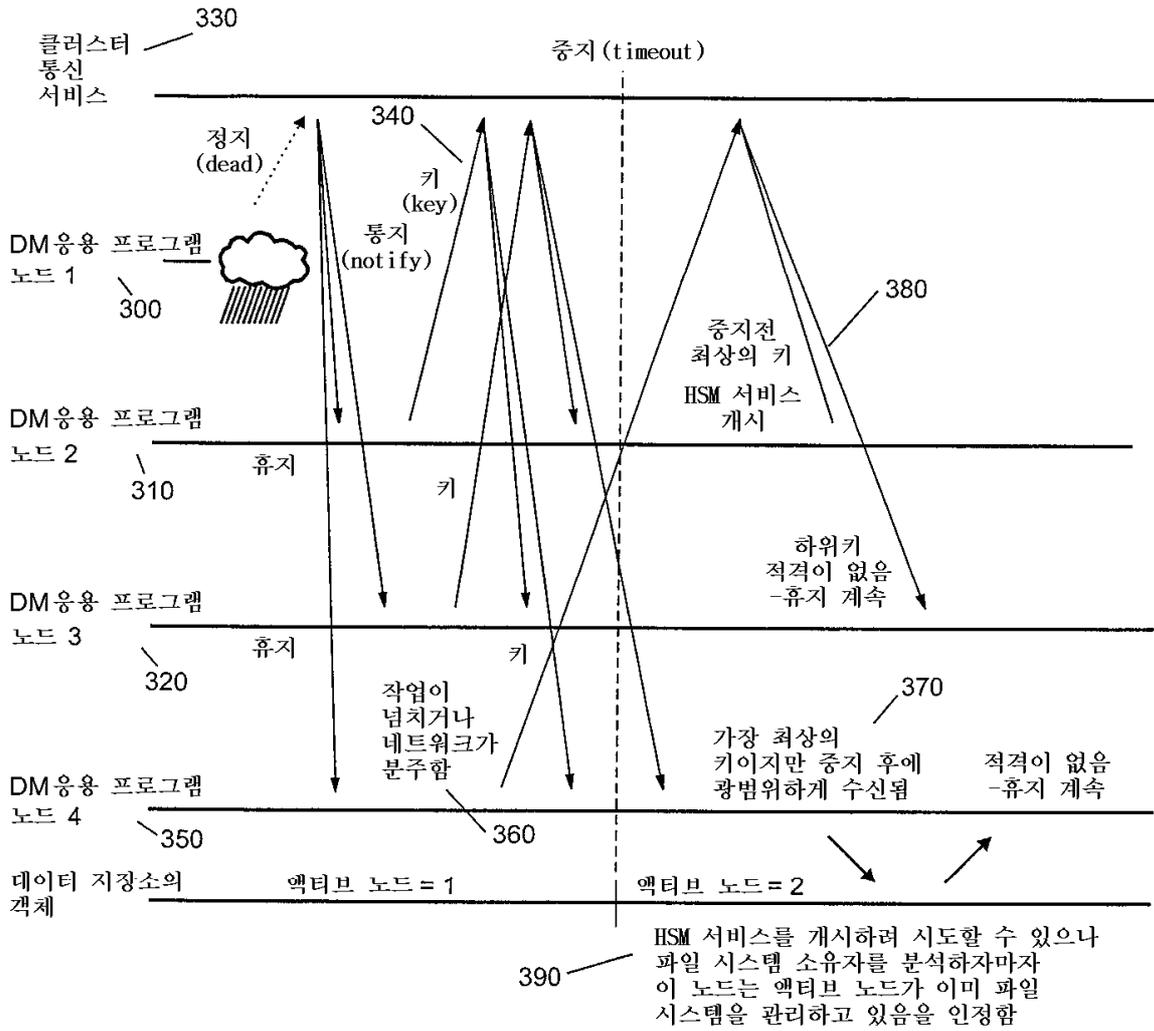
9 12.  
9 11

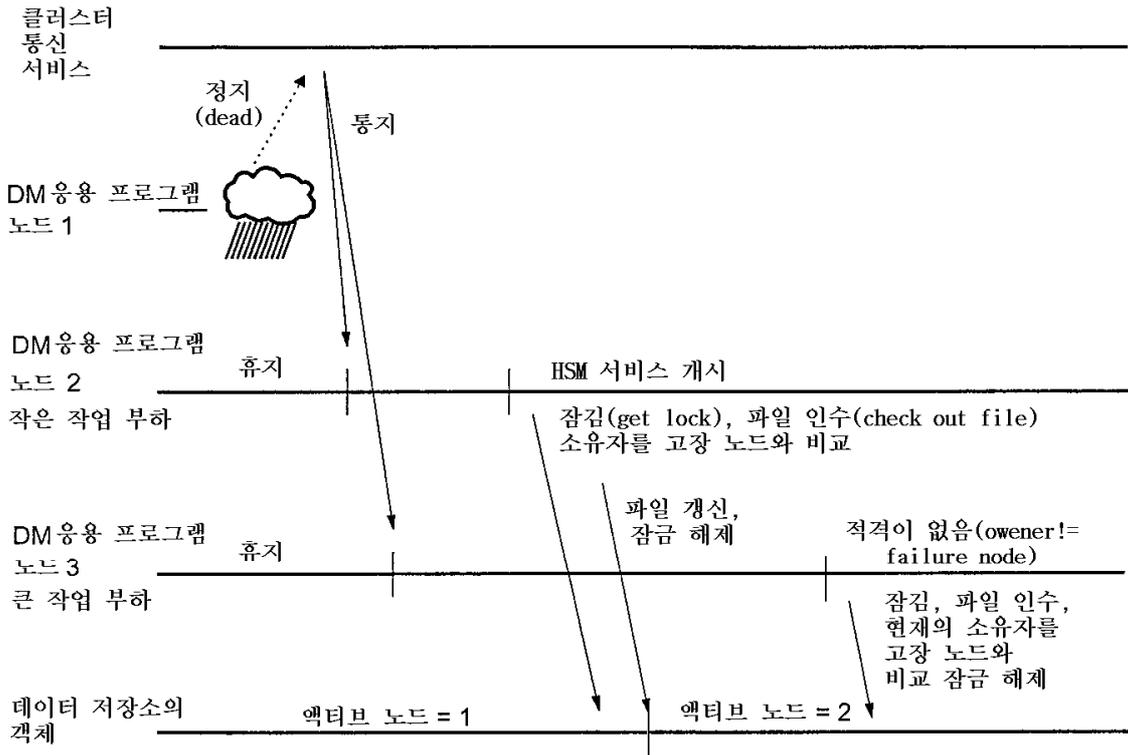
1

(종래 기술)

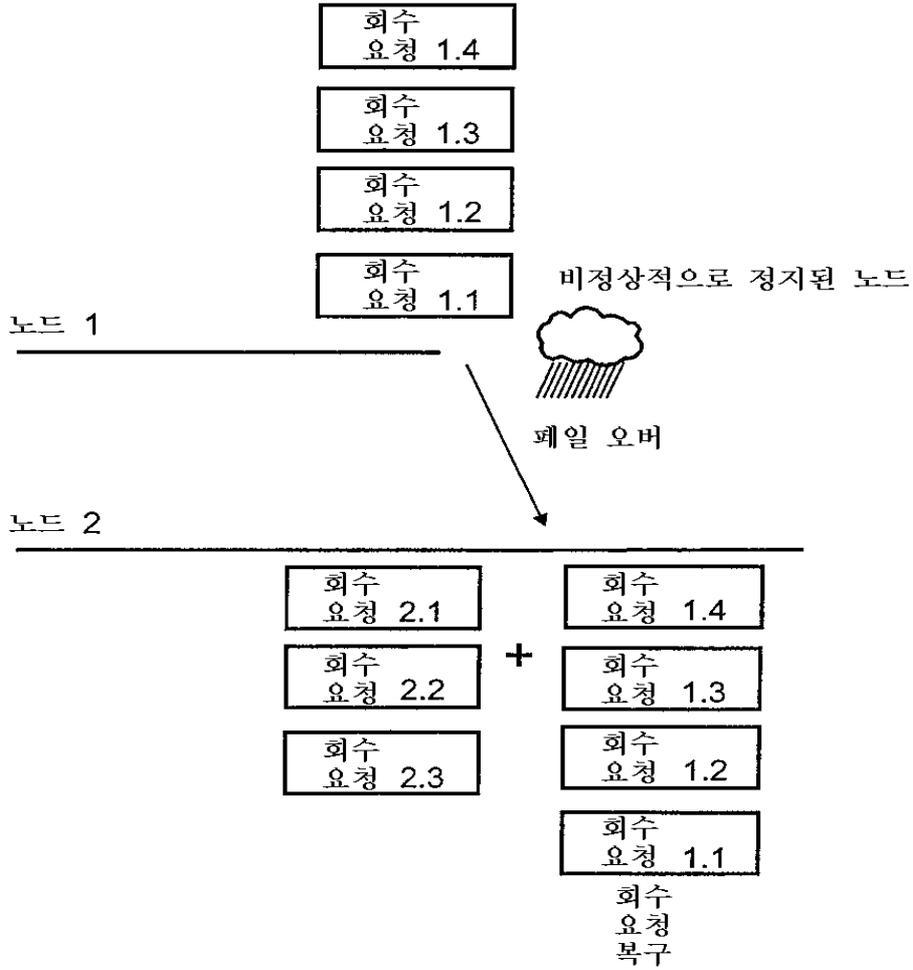








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