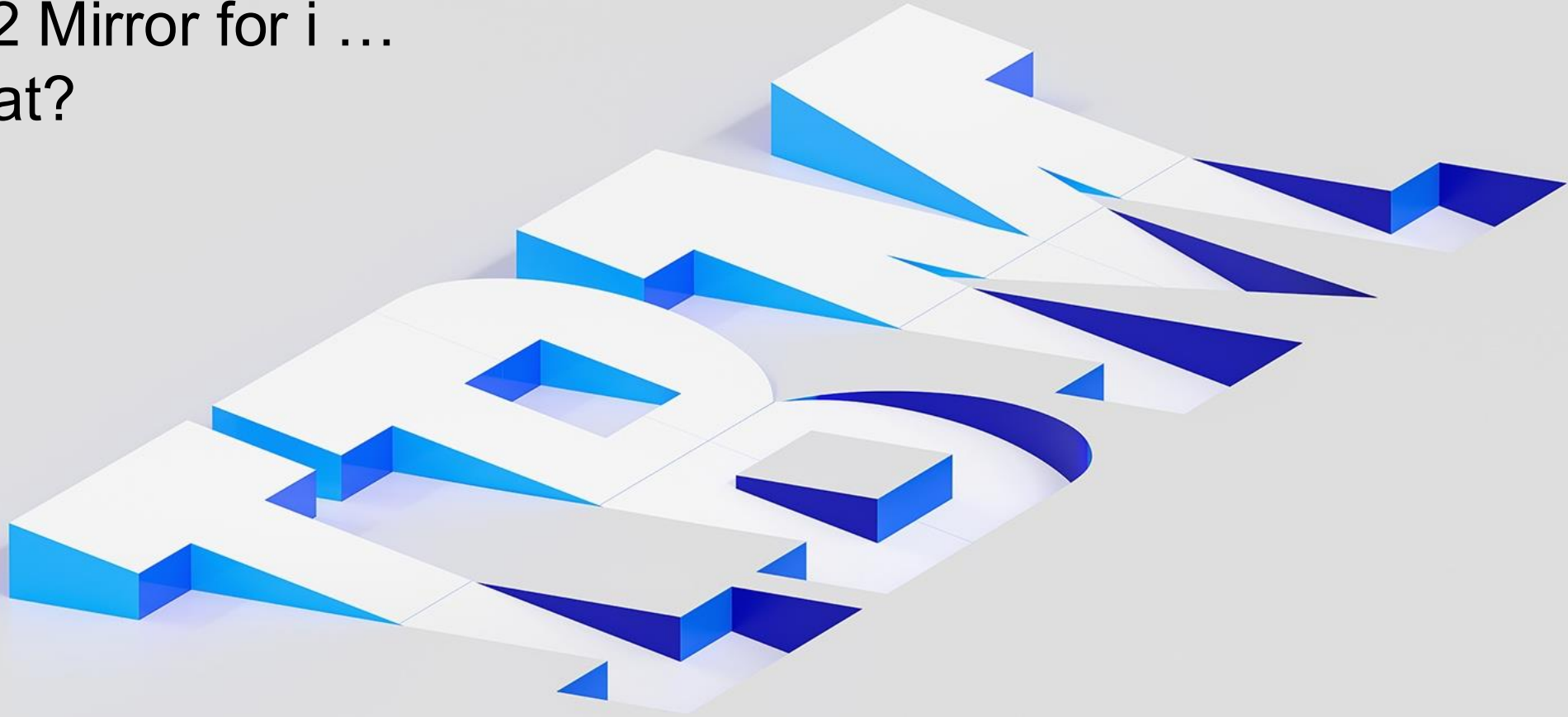


I'm interested in deploying
IBM Db2 Mirror for i ...
now what?



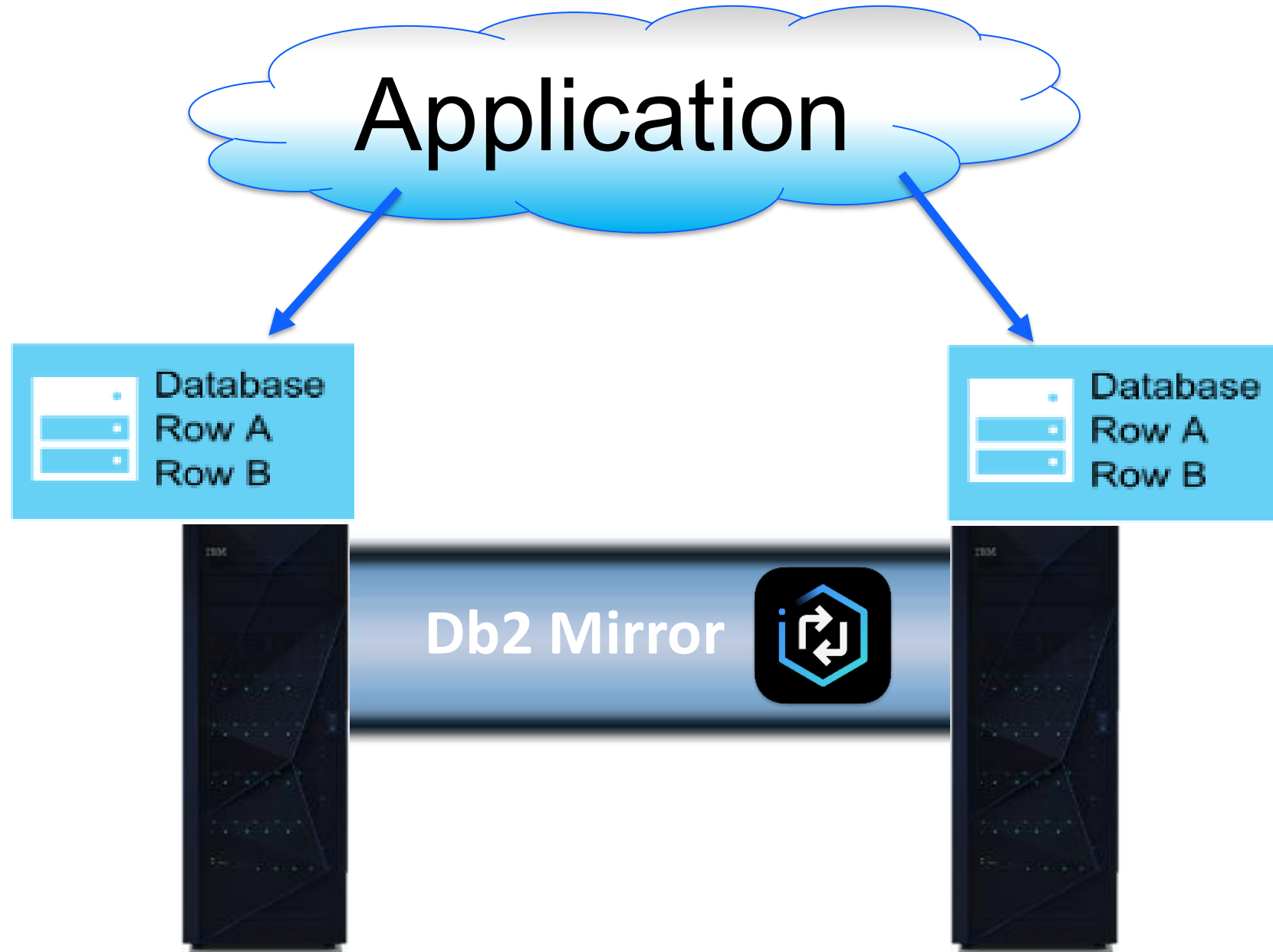
Guide / Agenda

1. Define the goals of your business (RTO/RPO)
2. Determine your replication requirements
 - Active/Active or Active/Passive
 - IASPs
 - Defining replication rules
 - Object replication eligibility
3. Plan your environment
 - Requirements
 - Redundancy
 - Disaster Recovery (DR)
4. Plan for application switching
5. Make application changes
6. Deploy a test environment
7. Deploy Db2 Mirror in production

#1 Define the goals of your business

- **Uptime requirement:** the total amount of time that an application must be available, typically expressed as a percent of working hours
- **Recovery Time Objective (RTO):** the maximum acceptable length of time that it takes to recover from an outage and resume normal operations for an application
- **Recovery Point Objective (RPO):** the acceptable amount of data loss after an unplanned outage, expressed as an amount of time
- **Outage coverage:** what types of outages are you trying to protect against

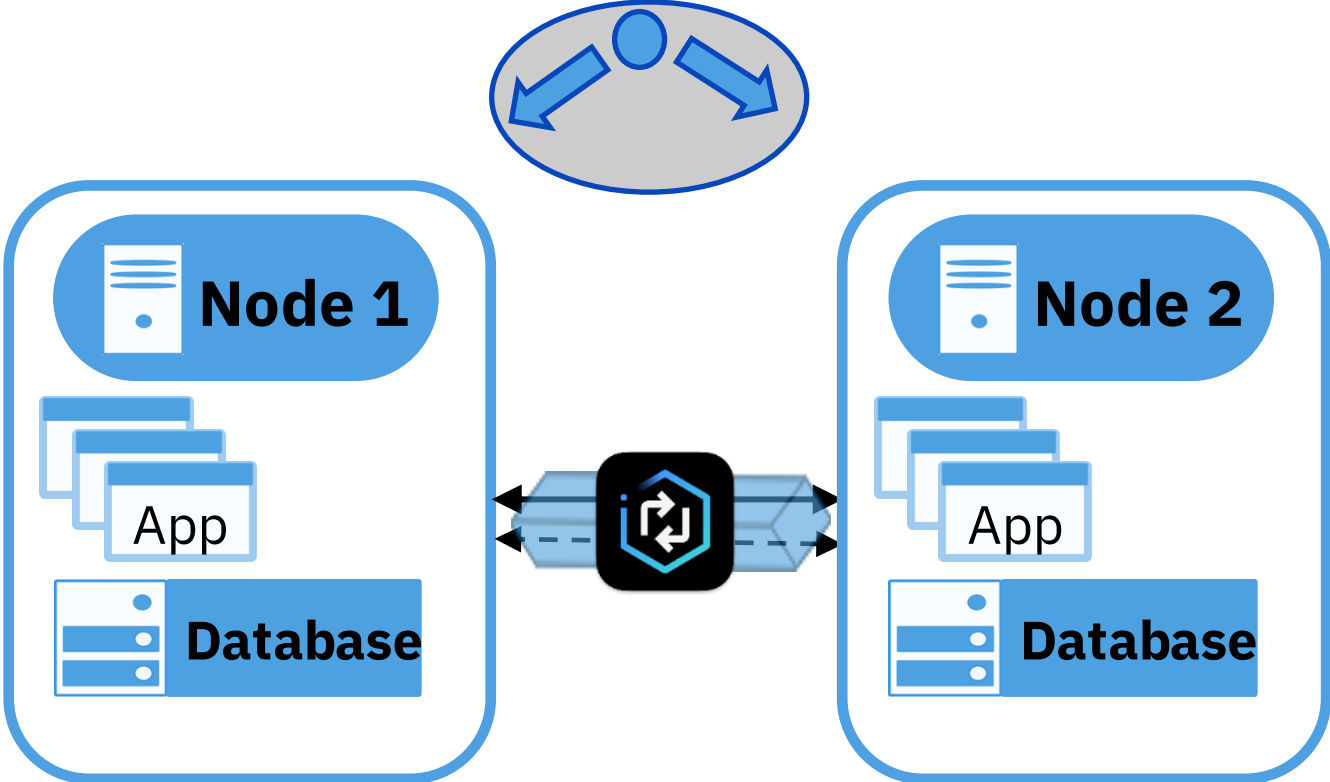
#2 Determine your replication requirements



Active/Active Applications

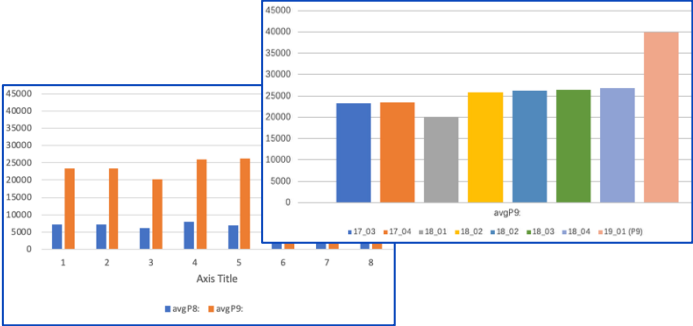
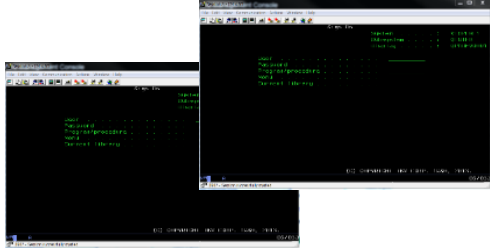


Application layer connects with either JDBC or Load Balancer

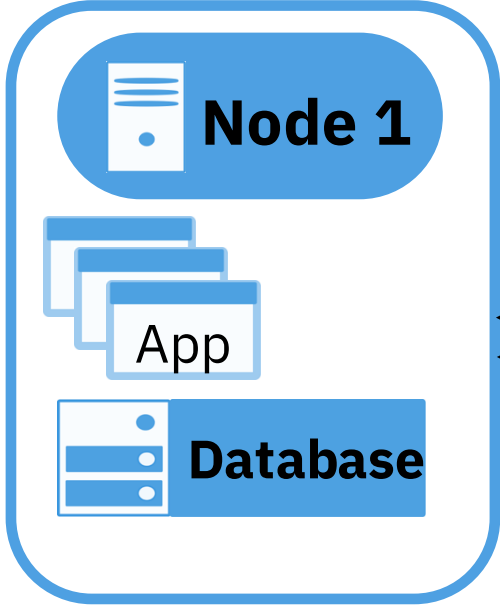


Active/Active Applications
Active/Active Database

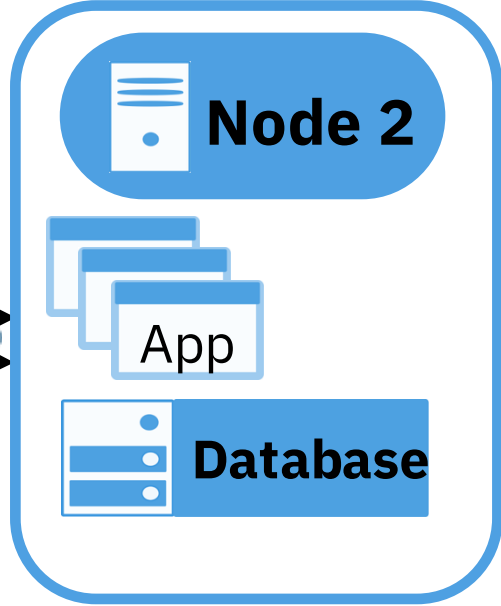
Active/Passive Applications



Run Production Workloads on this node

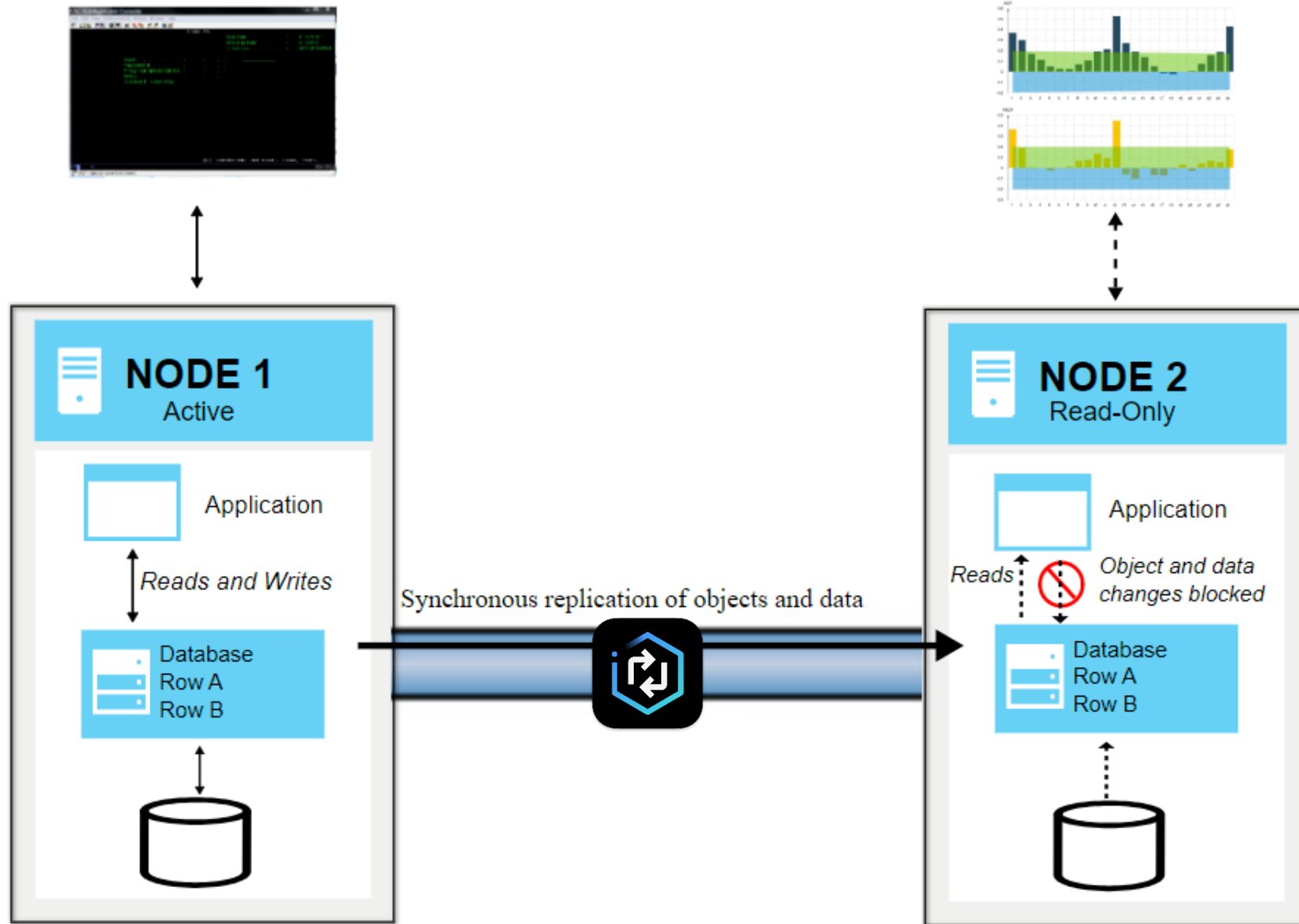


Run Queries and reports on this node



Active/Active Database

Active/Read-only Db2 Mirror



Run
Production
Workloads
on this node

Run Queries
and reports
on this node

Independent Auxiliary Storage Pools (IASPs)

Database IASP

Db2 Mirror will synchronously replicate eligible database and system objects in an IASP between the two nodes.

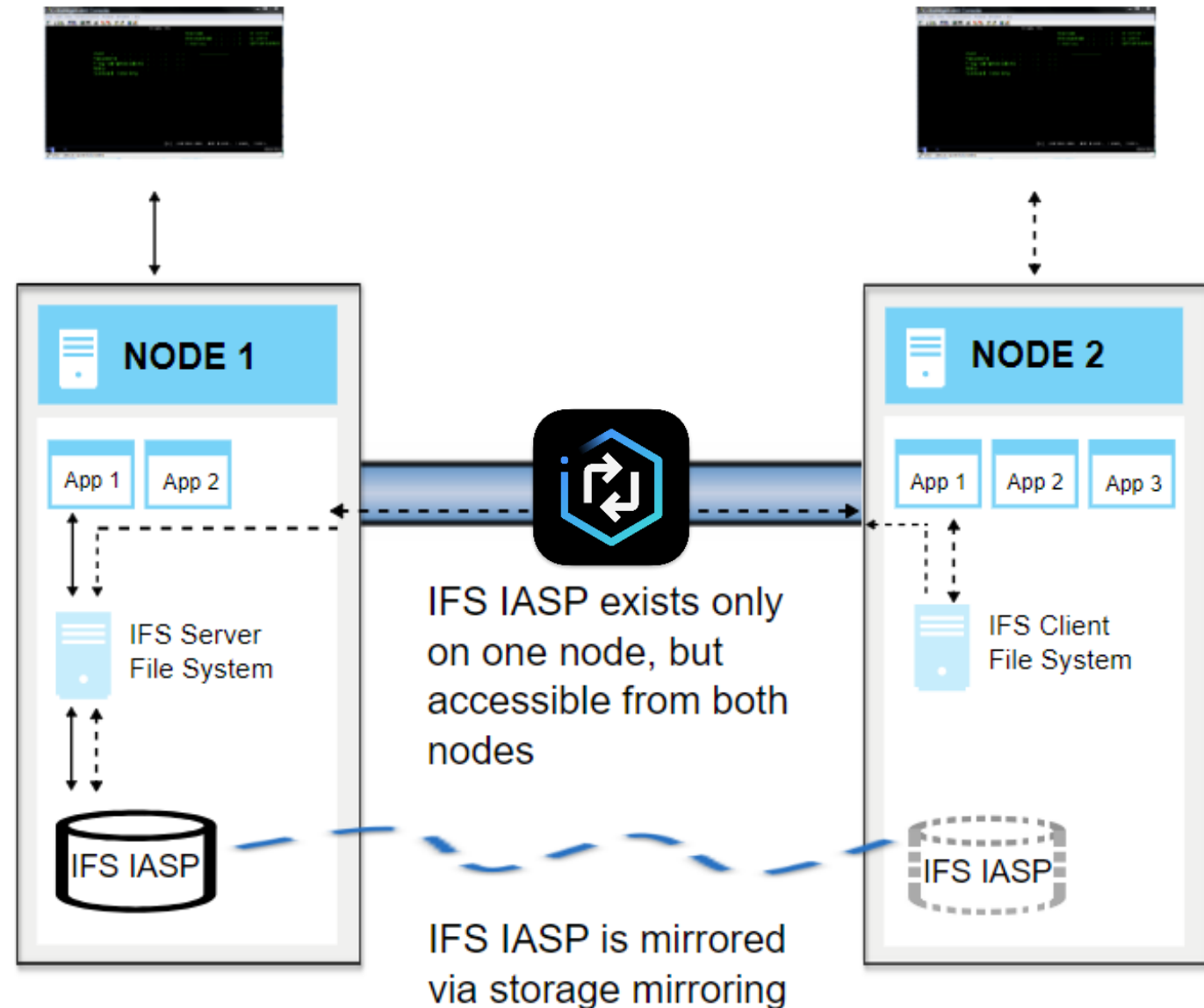
Integrated File System (IFS) IASP

Db2 Mirror enables both nodes to access IFS objects in an IASP that is varied on to only one node.

- IASPs are optional for database data
- IASPs are required for IFS data
- Only one type of data can be made highly available when an IASP contains both types

Db2 Mirror IFS data

- IFS objects are made available on both nodes using a new IFS technology called Mutable File System
- All IFS objects within an IASP are made accessible on both nodes
- Hardware replication or LUN-level switching managed by PowerHA is used to make the IASP switchable
- Geographic Mirroring (without PowerHA) can also be used to make the IASP switchable



Migrating IFS objects to an IASP

- Create the IASP
 - CFGDEVASP
 - Can be either an UDFS IASP or a Primary IASP if journaling is desired
- Vary on the IASP
 - WRKCFGSTS <IASPNAME> or VRYCFG
- Copy IFS data that should be available on both nodes into the new directory inside the IASP.
 - CPY or MOV command
 - Integrated File System interface within ACS
- Delete the original IFS data and create symbolic links that redirect access from the old directories to the new directories in the IASP
 - ADDLNK OBJ(newobjpath) NEWLNK(originalobjectpath) LINKTYPE(*SYMBOLIC)

Defining your replication rules

- **Replication Criteria List (RCL):** A hierarchical set of rules that define the objects that are to be replicated.
- **Default inclusion state:** the highest-level rule
 - EXCLUDE
 - No objects are replicated by default
 - Rules identify the objects to be included in replication
 - INCLUDE
 - All eligible objects are replicated by default
 - Rules identify the objects to be excluded from replication

Managing replication rules in the Db2 Mirror GUI

IBM Db2 Mirror for i Primary: ZZ2P11 Secondary: ZZ2P10 sbsmith

Manage Replication List - Both

Primary - ZZ2P11 | Secondary - ZZ2P10 | Rules | Both | Inspect

Select Pending Group: Pending Group: sbsmith

Add a Rule

Library Name: Object Type: Object Name:

Status	Library Name	Object Type	Object Name	Replica State
All		All		All
➔	SBSBLD	*ALL	*ALL	Excl
➔	SBSMITH	*ALL	*ALL	Excl

Total Rows: 2 | Page: 1 | 300

Inspection of the Rules

Status	Library Name	Current Replication State	Pending Replication State	Object Count
	SBS	All		
👑	SBSMITH	➕ Include	➖ Exclude	-
	SBSTEST	➕ Include	➕ Include	-

What objects are eligible for replication?

Database replication eligible objects

Native:

- Database Physical & Logical File

SQL:

- Alias
- Function
- Global Variable
- Index
- Procedure
- Schema
- Sequence
- SQL Package
- Table
- Trigger
- User Defined Type
- View
- XML Schema Repository



DDS / Record Level Access

SQL / Set Based Access

Replicated Objects can be in **SYSBAS** or **IASPs**

Additional replication eligible objects:

- Environment Variables (System Level)
- Programs / Service Programs
- Data Areas
- Data Queues
- User Spaces
- User Indexes
- System Values
- Libraries
- Job Descriptions
- Journals
- Output Queues / Spooled Files
 - Replication Interval
- Job Queues
 - Definition only

Replication of Security Implementation

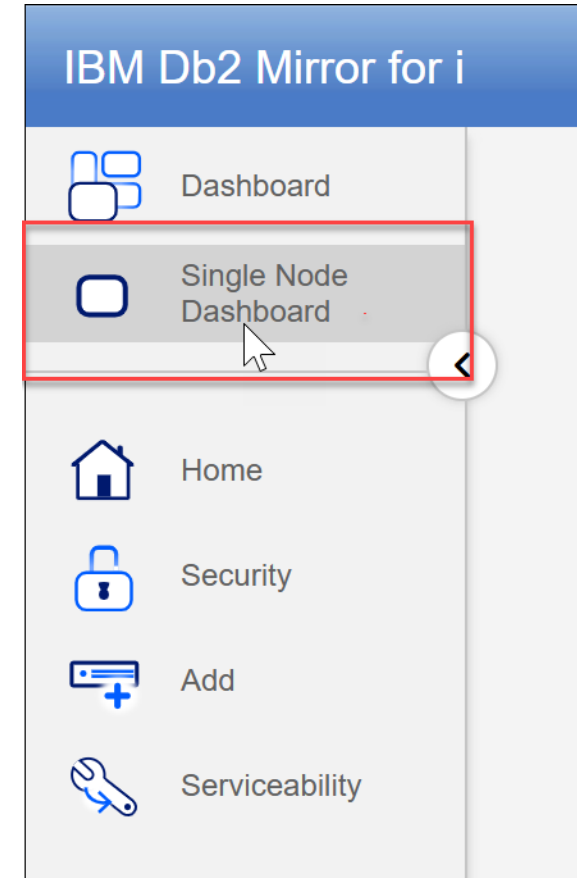
Security changes are always replicated:

- User Profiles
- Public & Private Authorities
- Function Usage
- Ownership
- Security Attributes
- Authorization Lists
- Security related System Values

**Synchronous replication of
Security Implementation
is built into Db2 Mirror**

Determining Replication Eligibility

- Use Application Evaluation tool built into the Db2 Mirror GUI
- Db2 Mirror GUI
 - 5770DBM *BASE – **No charge LPP**
 - Runs in the ADMIN3 server
 - Connect via a browser:
<http://<IBMi-System>:2001/Db2Mirror/>
- Db2 Mirror GUI runs on IBM i 7.4, 7.5, or 7.6 but Application Evaluation can evaluate any IBM i at 7.2 or later
- Install LPP & then latest Db2 Mirror PTF group level for latest and greatest App Eval features



Add a non-mirrored IBM i to evaluate

The screenshot shows the IBM Db2 Mirror for i interface. On the left is a navigation menu with options: Dashboard, Single Node Dashboard, Home, Security, Add, and Serviceability. The 'Add' option is highlighted. The main area displays two nodes: DB2MT1P9 and DB2MT1PA. A blue 'Add' button is positioned between them. A context menu is open over the 'Add' button, listing three options: 'Configure New Pair', 'Add Configured Pair', and 'Add New System'. A mouse cursor is pointing at 'Add New System'. A callout box points to this option with the text 'Add a node for application evaluation'. The DB2MT1PA node is labeled 'Not Mirrored' and has a shield icon with a refresh symbol.

Add New System

Specify the hostname or IP address and authentication information of the system:

*Host Name:

User and password used to login to the GUI interface will be used to access this system.

Connection method used:

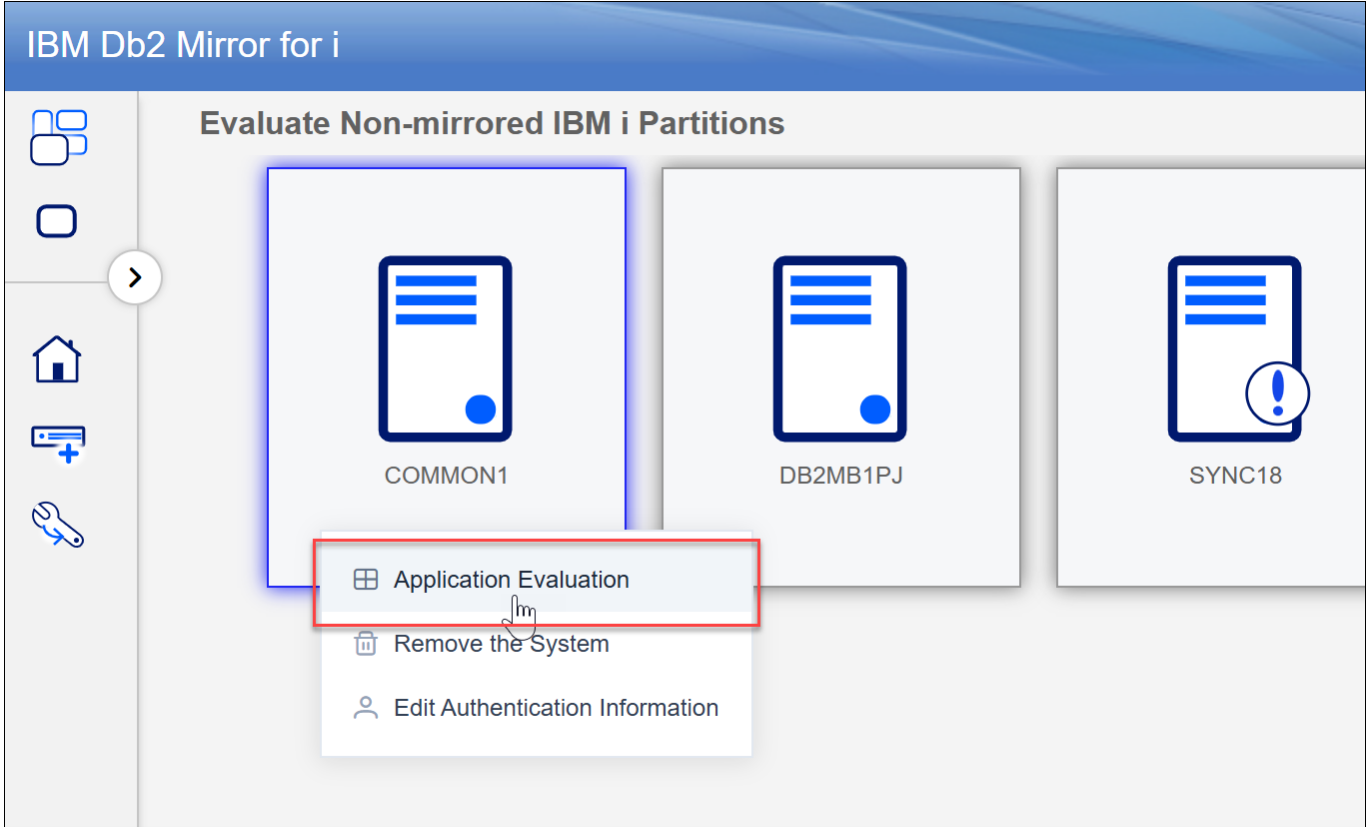
- Non-secure, no TLS
- Secure, use TLS

Verify

Host Name	TLS Enablement
No records found	

Delete

Launch Application Evaluation










Application Evaluation – First time in

IBM Db2 Mirror for i

System Name: ▼



Application Evaluation - Replication El



 Library Data is currently building. Check progress using Build Library Data table action. ✕

Library Name 	Replication Eligibility 	Total Objects 	Eligible Objects 	Ineligible Objects 	Definition Only Objects 
<input type="text"/>					

No records found

Total Rows: 0 ◀◀ < > ▶▶ 300 ▼

-  Customize Columns
-  Build Library Data

Application Evaluation – Build Library Data

IBM Db2 Mirror for i System Name: COMMON1

Application Evaluation - Replication Eligibility

*SYSBAS

Library Name	Replication Eligibility	Total Objects	Eligible Objects	Ineligible Objects	Definition Only Objects
STARWARS					
GALAXY					
AAADTALIB	✓ Eligible	1	1	0	0
ACTESTLIB	✓ Eligible	89	88	1	0
AECIESLA	✓ Eligible	25	21	4	0
AECIESLA1	✓ Eligible	25	20	5	0
AFSSTARTER					0
AGHIRPT					0
ALUSHER					0
AMRA					0
APACHELAB					0
APLIB					0
ARCAD_DEMO					0
ARCAD_DTA					0
ARCAD_ENG					0
ARCAD_NET					0
ARCAD_OBJ					0
ARCAD_PRD					0
ARCAD_SRC					0
ARCAD_SYS					0
ARCINST_M1					0
AREDEMO					0
AREPORT					0
ARETEST					0
ARRPLOBJ					0
AUDMON	✓ Eligible	29	23	6	0
AUTCOLDATA	✓ Eligible	1	1	0	0

Build Library Data (common1.frankeni.com)

Table: QUSRSYS.DB2_MIRROR_APP_ELIG SQL ↻

*SYSBAS
Last Built On: 2024-01-20 09:43:02
Current Build Status: In Progress

⌚ 23%

2026-04-22 02:52:32 36.7 seconds
[732541/QUSER/QZDASOINIT](#)

Rebuild

GALAXY
Last Built On:
Current Build Status:

Rebuild

Close

Application Evaluation – Library level view

Use for filtering

IBM Db2 Mirror for i System Name: COMMON1

Application Evaluation - Replication Eligibility

*SYSBAS

STARWARS

GALAXY

Library Name ↑	Replication Eligibility ↑↓	Total Objects ↑↓	Eligible Objects ↑↓	Ineligible Objects ↑↓	Definition Only Objects ↑↓
DEM					
DEMO	✓ Eligible	41	21	20	0
DEMODATA	✓ Eligible	63	60	3	0
DEMODATA2	✓ Eligible	48	48	0	0
DEMOTODAY	✓ Eligible	38	21	17	0

Total Rows: 4 << < 1 > >> 300

Last Built On 2024-01-20 09:43:02

Application Evaluation – Double click to drill down

IBM Db2 Mirror for i System Name: COMMON1

Application Evaluation - Replication Eligibility

*SYSBAS

- STARWARS
- GALAXY

Library Name	Replication Eligibility	Count
AAADTALIB	✓ Eligible	1
ACTESTLIB	✓ Eligible	8
AECIESLA	✓ Eligible	2
AECIESLA1	✓ Eligible	2
AFSSTARTER	✓ Eligible	2
AGHIRPT	✓ Eligible	4
ALUSHER	✓ Eligible	4
AMRA	✓ Eligible	3
APACHELAB	✓ Eligible	3
APLIB	✓ Eligible	1
ARCAD_DEMO	✓ Eligible	2
ARCAD_DTA	✓ Eligible	3
ARCAD_ENG	✓ Eligible	2
ARCAD_NET	✓ Eligible	0
ARCAD_OBJ	✓ Eligible	7
ARCAD_PRD	✓ Eligible	7
ARCAD_SRC	✓ Eligible	11
ARCAD_SYS	✓ Eligible	8
ARCINST_M1	✓ Eligible	6
AREDEMO	✓ Eligible	2
AREPORT	✓ Eligible	0
ARETEST	✓ Eligible	0

ARCAD_PRD All Objects | Grouped By Eligibility

Object Type	Replication Eligibility	Object Count
*DTAARA	✓ Eligible	151
*DTAQ	✓ Eligible	3
*FILE	⊗ Ineligible	482
*FILE	✓ Eligible	2712
*JOB	✓ Eligible	4
*JRN	⊗ Ineligible	1
*JRNRCV	⊗ Ineligible	1
*MSGQ	⊗ Ineligible	3
*OUTQ	✓ Eligible	1
*PGM	✓ Eligible	3505
*QRYDFN	⊗ Ineligible	1
*SRVPGM	✓ Eligible	274
*TBL	⊗ Ineligible	1
*USRSPC	✓ Eligible	10

Total Rows: 7 1 100

Application Evaluation – Drill down further

IBM Db2 Mirror for i System Name: COMMON1

Application Evaluation - Replication Eligibility

*SYSBAS

STARWARS

GALAXY

ARCAD_PRD

Object Type	Replication Eligibility	Object Count
*DTAARA	Eligible	151
*DTAQ	Eligible	3
*FILE	Ineligible	482
*FILE	Eligible	2712
*JOB	Eligible	4
*JRN	Ineligible	1
*JRNRCV	Ineligible	1
*MSGQ	Ineligible	3
*OUTQ	Eligible	1
*PGM	Eligible	3505
*QRYDFN	Ineligible	1
*SRVPGM	Eligible	274
*TBL	Ineligible	1
*USRSPC	Eligible	10

Total Rows: 14

*FILE - Eligible

Object Name	Object Long Name	Object Type	SQL Object Type	Replication Eligibility	Object Attributes	Object Create
AARCAPFF1	AARCAPFF1	*FILE	TABLE	Eligible	PF	2018-11-30 22:
AARCAPFL1	AARCAPFL1	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCAPPF1	AARCAPPF1	*FILE	TABLE	Eligible	PF	2018-11-30 22:
AARCAPPL1	AARCAPPL1	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCAPPL2	AARCAPPL2	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCAPPL5	AARCAPPL5	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCAPPL6	AARCAPPL6	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCAPVF1	AARCAPVF1	*FILE	TABLE	Eligible	PF	2012-12-09 08:
AARCAPVL1	AARCAPVL1	*FILE	INDEX	Eligible	LF	2012-12-09 08:
AARCAPVL2	AARCAPVL2	*FILE	INDEX	Eligible	LF	2012-12-09 08:
AARCATCF1	AARCATCF1	*FILE	TABLE	Eligible	PF	2018-11-30 22:
AARCATCL1	AARCATCL1	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCCDFF1	AARCCDFF1	*FILE	TABLE	Eligible	PF	2018-11-30 22:
AARCCPAF1	AARCCPAF1	*FILE	TABLE	Eligible	PF	2018-11-30 22:
AARCVNF1	AARCVNF1	*FILE	TABLE	Eligible	PF	2018-11-30 22:
AARCVNLA	AARCVNLA	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCVNLB	AARCVNLB	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCVNLC	AARCVNLC	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCVNL1	AARCVNL1	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCVNL2	AARCVNL2	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCVNL3	AARCVNL3	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCVNL4	AARCVNL4	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCVNL5	AARCVNL5	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCVNL6	AARCVNL6	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCVNL7	AARCVNL7	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCVNL8	AARCVNL8	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCVNL9	AARCVNL9	*FILE	INDEX	Eligible	LF	2018-11-30 22:
AARCIFDF1	AARCIFDF1	*FILE	TABLE	Eligible	PF	2011-10-01 00:
AARCIFDL1	AARCIFDL1	*FILE	INDEX	Eligible	LF	2011-10-01 00:

Total Rows: 2712

ARCAD_PRD: Total Rows: 3042

*FILE - Eligible: Total Rows: 2712

Scroll →

Application Evaluation – Customize table columns

IBM Db2 Mirror for i System Name: COMMON1

Application Evaluation - Replication Eligibility

Library Name	Replication Eligibility	Object Count
AAADTALIB	Eligible	1
ACTESTLIB	Eligible	8
AECIESLA	Eligible	2
AECIESLA1	Eligible	2
AFSSTARTER	Eligible	2
AGHIRPT	Eligible	4
ALUSHER	Eligible	4
AMRA	Eligible	3
APACHELAB	Eligible	3
APLIB	Eligible	1
ARCAD_DEMO	Eligible	27
ARCAD_DTA	Eligible	3
ARCAD_ENG	Eligible	20
ARCAD_NET	Eligible	0
ARCAD_OBJ	Eligible	7
ARCAD_PRD	Eligible	7
ARCAD_SRC	Eligible	11
ARCAD_SYS	Eligible	8
ARCINST_M1	Eligible	6
AREDEMO	Eligible	2
AREPORT	Eligible	0
ARETEST	Eligible	0
ARRPLOBJ	Eligible	4
AUDMON	Eligible	2
AUTCOLDATA	Eligible	1
BADSTUFF	Eligible	3

Object Type	Replication Eligibility	Object Count
*DTAARA	Eligible	151
*DTAQ	Eligible	3
*FILE	Ineligible	482

Object Name	Object Long Name
AARCAPFF1	AARCAPFF1
AARCAPFL1	AARCAPFL1
AARCAPPF1	AARCAPPF1

Customize table columns

Customize Table Columns

Available Columns

- Object Text
- Object Size
- Object Owner
- Object Definer
- Library Name
- Read Percentage
- Open Operations
- Close Operations
- Insert Operations
- Update Operations
- Logical Reads

>

>>

<

<<

Selected Columns

- Object Name
- Object Long Name
- Object Type
- SQL Object Type
- Replication Eligibility
- Object Attributes
- Object Created
- Object Changed
- Object Last Used
- Object Restored
- Number Of Members

Reset DefaultOK

Application Evaluation – Runtime statistics

Application Evaluation - Replication Eligibility

*SYSBAS

STARWARS

GALAXY

Library Name

Replication Eligibility

ARCAD_PRD

*FILE - Eligible

Object Type	Replication Eligibility	Object Count	Object Attributes	Object Name	Object Changed	Object Last Used	Reorganize Operations	Copy Operations	Clear Operations	Delete Operations	Random Reads	Sequential Reads	Physical Reads	Logical Reads	Update Operations	Insert Operations	Close Operations	Open Operations	Read Percentage	
*DTAARA	Eligible	151																		
*DTAQ	Eligible	3	PF	AARFRTNF1	2022-06-29 18:14:02	2026-03-05	0	0	0	0	2235	0	22	2235	0	0	43	43	100	
*FILE	Ineligible	482	PF	AARKSOURCE	2022-06-29 18:14:23	2026-03-05	0	0	0	0	0	0	0	0	0	0	1	1	100	
*FILE	Eligible	2712	PF	AART440F1	2022-06-29 18:14:46	2026-03-05	0	0	0	0	0	0	0	0	0	0	1	1	100	
*JOBDB	Eligible	4	PF	ARCLSRC	2022-06-29 18:15:09	2026-03-05	0	0	0	0	9286	0	40	9286	0	0	37	37	100	
*JRN	Ineligible	1	PF	ARCLSRC2	2022-06-29 18:15:09	2026-03-05	0	0	0	0	19332	0	61	19332	0	0	36	36	100	
*JRNRCV	Ineligible	1	PF	ARRPGLESRC	2022-06-29 18:15:09	2026-03-05	0	0	0	0	2227	0	13	2227	0	0	13	13	100	
*MSGQ	Ineligible	3	PF	ARRPGLESR2	2022-06-29 18:15:09	2026-03-05	0	0	0	0	1348	0	8	1348	0	0	8	8	100	
*OUTQ	Eligible	1	PF	ARSQLEXT	2022-06-29 18:15:09	2026-03-05	0	0	0	0	642	0	22	642	0	0	31	31	100	
*PGM	Eligible	3505	PF	ARSRMBR	2022-06-29 18:15:09	2026-03-05	0	0	0	0	3957	0	19	3957	0	0	37	37	100	
*QRYDFN	Ineligible	1	PF	ARSRMBR2	2022-06-29 18:15:09	2026-03-05	0	0	0	0	16	0	0	16	0	0	1	1	100	
*SRVPGM	Eligible	274	PF	AARCAPPF1	2022-06-29 18:14:01	2026-01-21	0	0	0	0	0	0	0	0	0	0	0	0	100	
*TBL	Ineligible	1	PF	AARKUSRF1	2026-01-21 08:51:44	2026-01-21	0	0	0	0	0	0	0	0	0	0	0	0	100	
*USRSPC	Eligible	10	LF	AARKUSRL1	2022-06-29 18:14:23	2026-01-21														
			LF	AARKUSRL2	2022-06-29 18:14:23	2026-01-21														
			LF	AARKUSRL3	2022-06-29 18:14:23	2026-01-21														
			LF	AARKUSRL4	2022-06-29 18:14:23	2026-01-21														
			LF	AARKUSRL5	2022-06-29 18:14:23	2026-01-21														
			PF	AARMUHIF1	2026-01-21 08:51:44	2026-01-21	0	0	0	0	0	0	0	0	0	0	0	0	100	
			PF	AARDRDOF1	2022-06-29 18:19:13	2024-11-21	0	0	0	0	0	0	0	0	0	0	0	0	100	
			PF	AARCCDF1	2022-06-29 18:14:01	2023-03-30	0	0	0	0	0	0	0	0	0	0	0	0	100	
			PF	AARCENVF1	2022-06-29 18:14:46	2023-03-30	0	0	0	0	0	0	0	0	0	0	0	0	100	
			PF	AARCINFF1	2022-06-29 18:14:01	2023-03-30	0	0	0	0	0	0	0	0	0	0	0	0	100	
			PF	AARCLBIF1	2022-06-29 18:14:01	2023-03-30	0	0	0	0	0	0	0	0	0	0	0	0	100	

Total Rows: 14

Filters

Grouped By Eligibility

#3 Plan your environment

- Requirements
- Plan for redundancy
- Plan for disaster recovery

Db2 Mirror Environment Requirements

Hardware Requirements

- POWER8, POWER9, Power10, or Power11 servers
- Remote Direct Memory Access (RDMA) over Converged Ethernet (RoCE) network adapters

LPAR Management Requirements

- Hardware Management Console (HMC)


Software Requirements

- IBM i operating system 7.4 or 7.5 or 7.6
- IBM i options and products
- Open-source packages (RPMs)

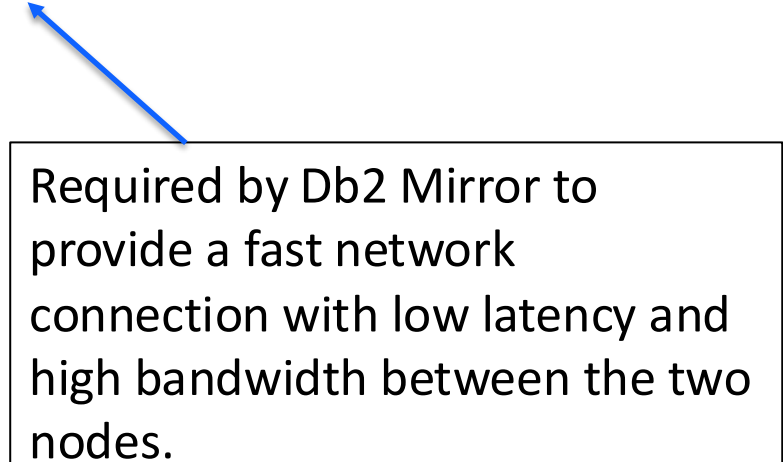
Storage

- IBM System Storage DS8000
- IBM Storage FlashSystem
- Internal disks

Automated
setup



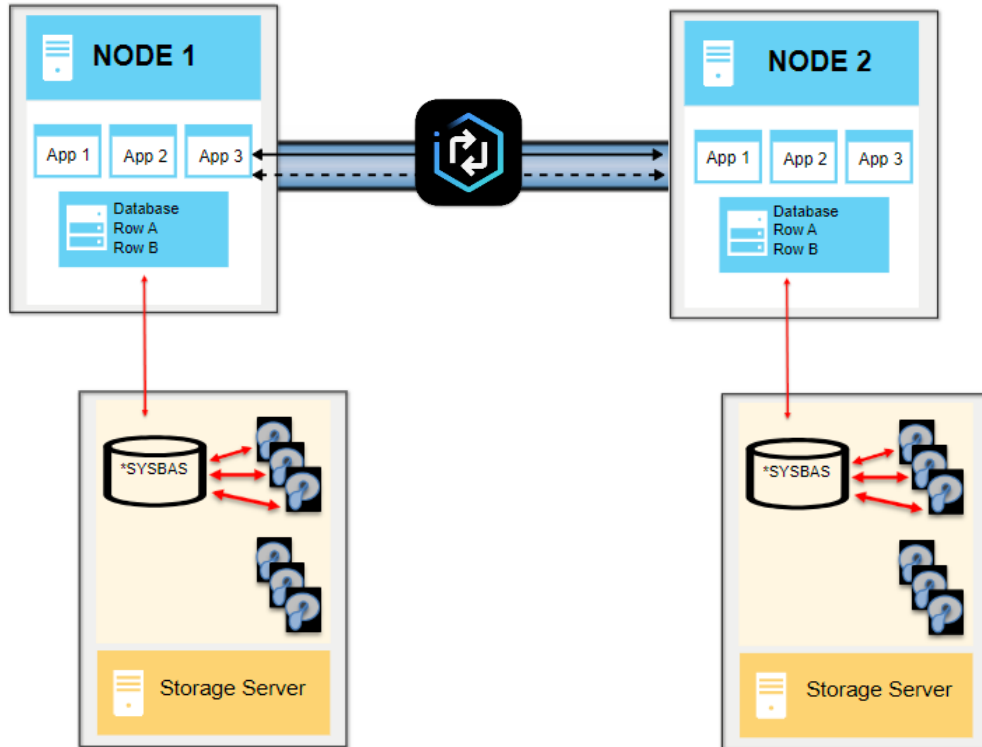
Required by Db2 Mirror to provide a fast network connection with low latency and high bandwidth between the two nodes.



IBM Storage Requirements for automated setup

Host and volume planning

- Must have same number of storage hosts
- Must have the same number and size of volumes



IBM System Storage DS8000

- Firmware V9.2.0 or higher is required
- No space efficient volumes
- REST service on DS8000 HMC is started
- User ID role of Administrator or Copy Services operator
- IBM Copy Services Manager (CSM) required for remote cloning

IBM Storage FlashSystem (powered by IBM Storage Virtualize)

- SSH used for communication
 - 5733SC1 *BASE & Option 1 required on managing node
- User ID role of Administrator
- User ID configured for sign on with SSH key

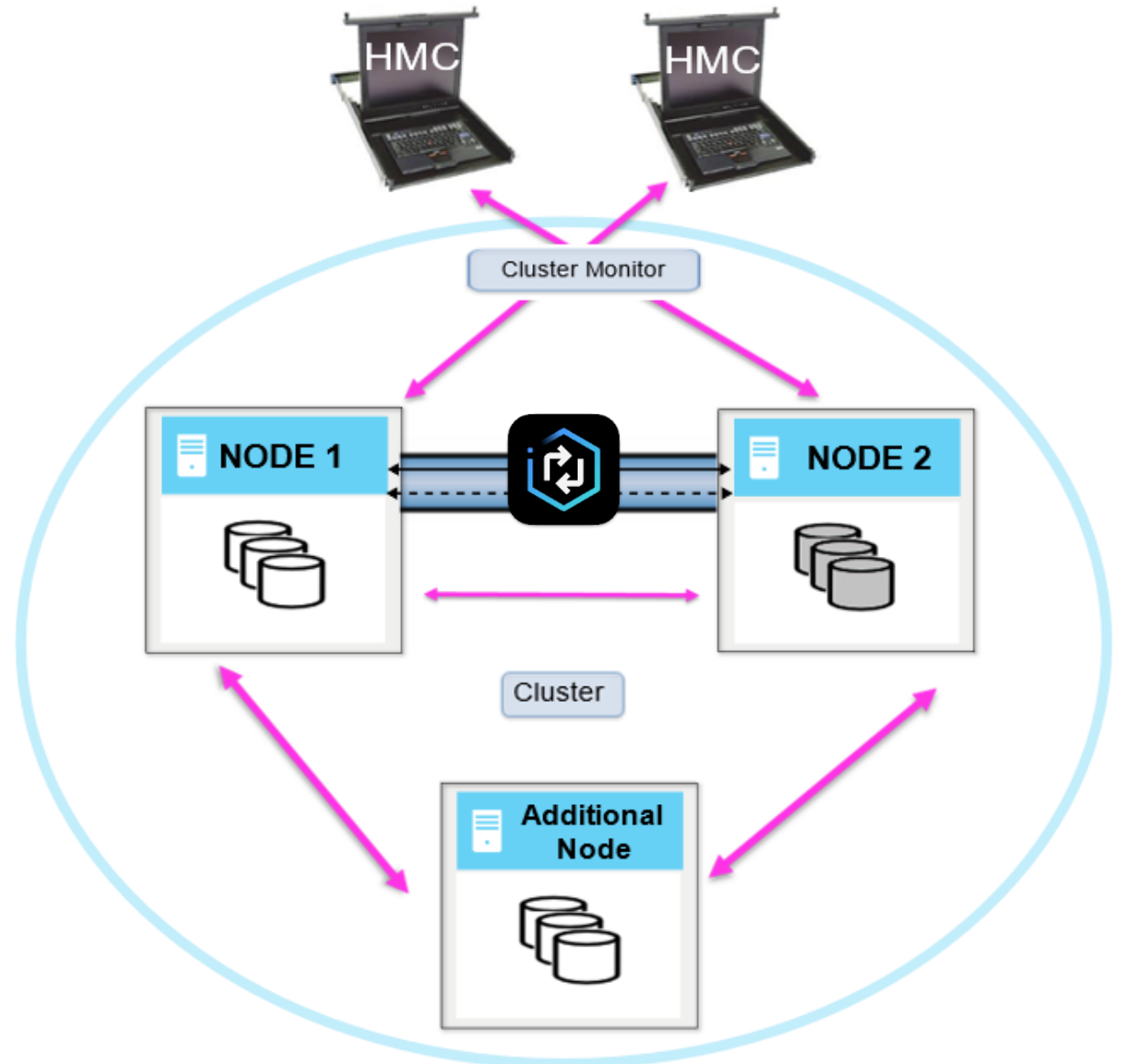
Db2 Mirror & Clustering

Clustering is used by Db2 Mirror for:

- IASP management
- maintaining quorum data
- advanced node failure detection

Details:

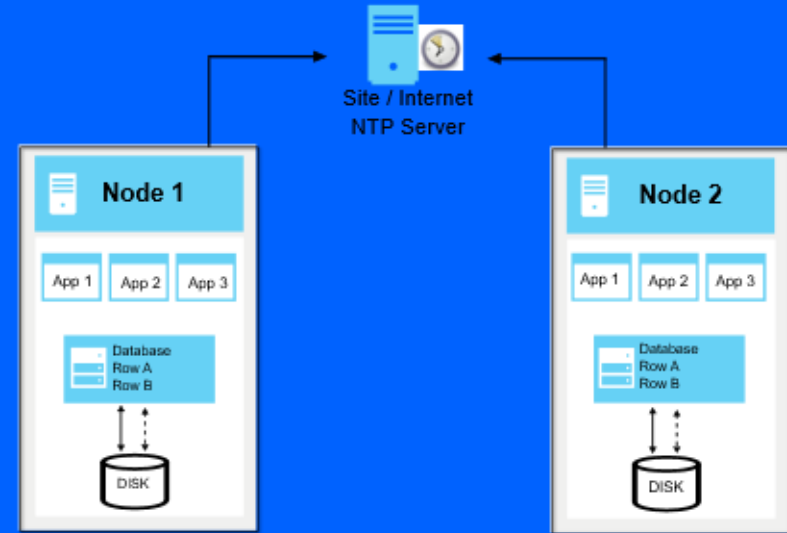
- New or existing cluster
- Cluster version 9 or higher required
- Cluster monitors are required
- Additional quorum node optional



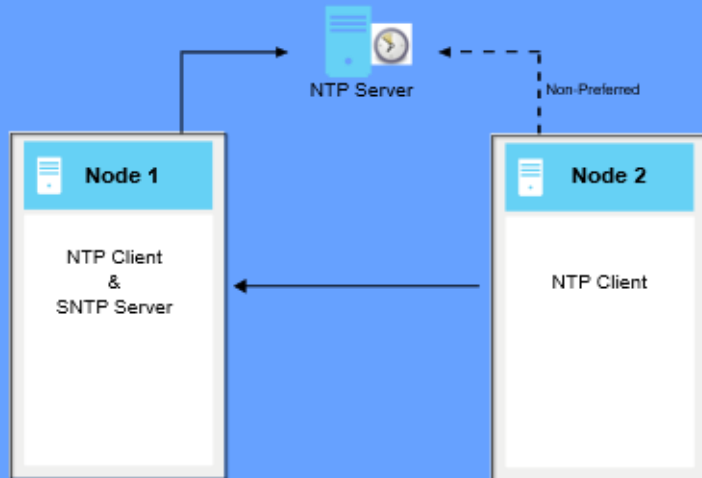
Time synchronization using NTP

The Network Time Protocol (NTP) client must be used to keep the system clocks synchronized.

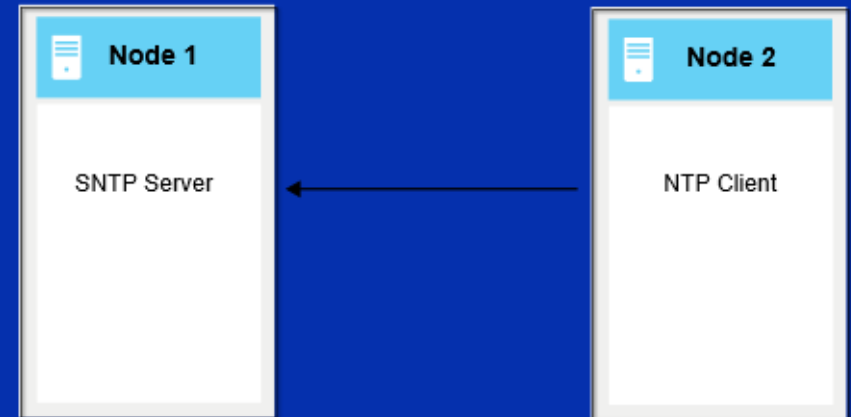
External Time Server



Chained Time Server



Peer Time Server



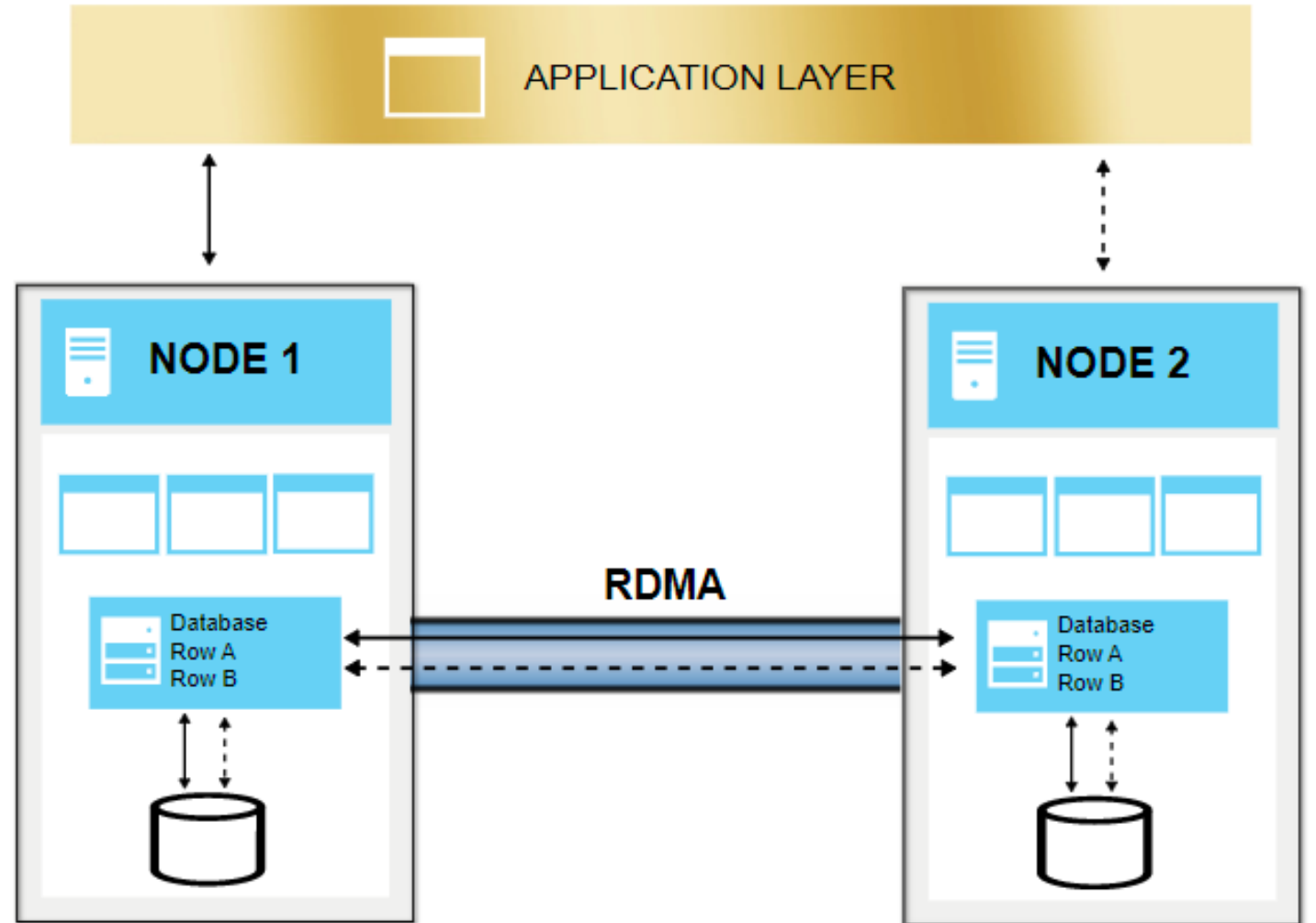
Plan for hardware redundancy

When planning to implement Db2 Mirror, it's important to understand your environment and your options for redundancy at the hardware level.

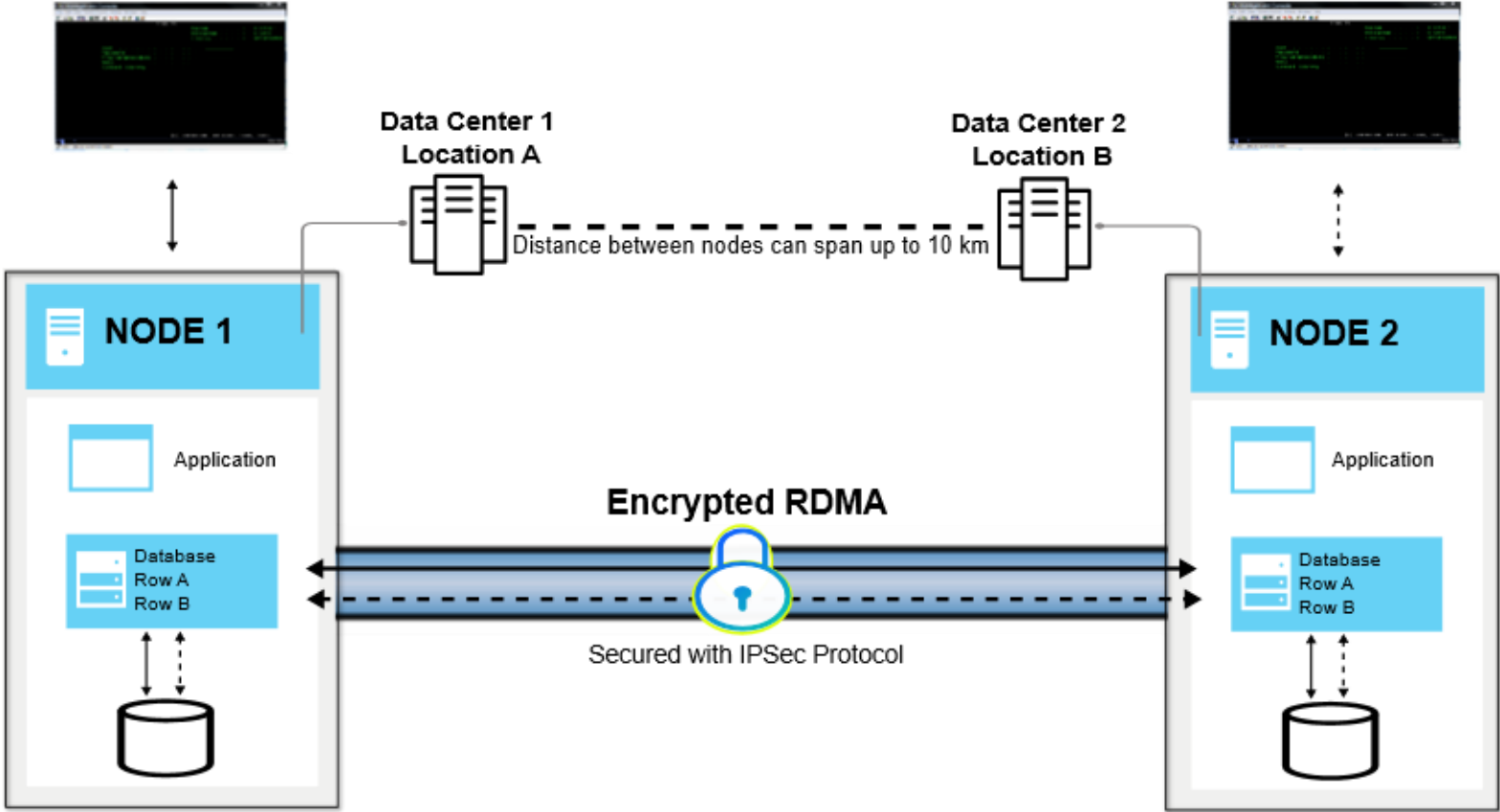
- Network
- Server
- Storage

Synchronous Replication Network Architecture

- Remote Direct Memory Access (RDMA)
- RDMA over Converged Ethernet (RoCE)
- Maximum distance of 200m for unencrypted RDMA



Synchronous Replication Network Architecture



4152.mf0604

Maximum distance of 10 km for encrypted RDMA

Synchronous Replication Network Architecture

Network Redundancy Groups (NRG)

- Built in protection for network failures
- Prioritization controls can be used to separate different types of traffic across specific links

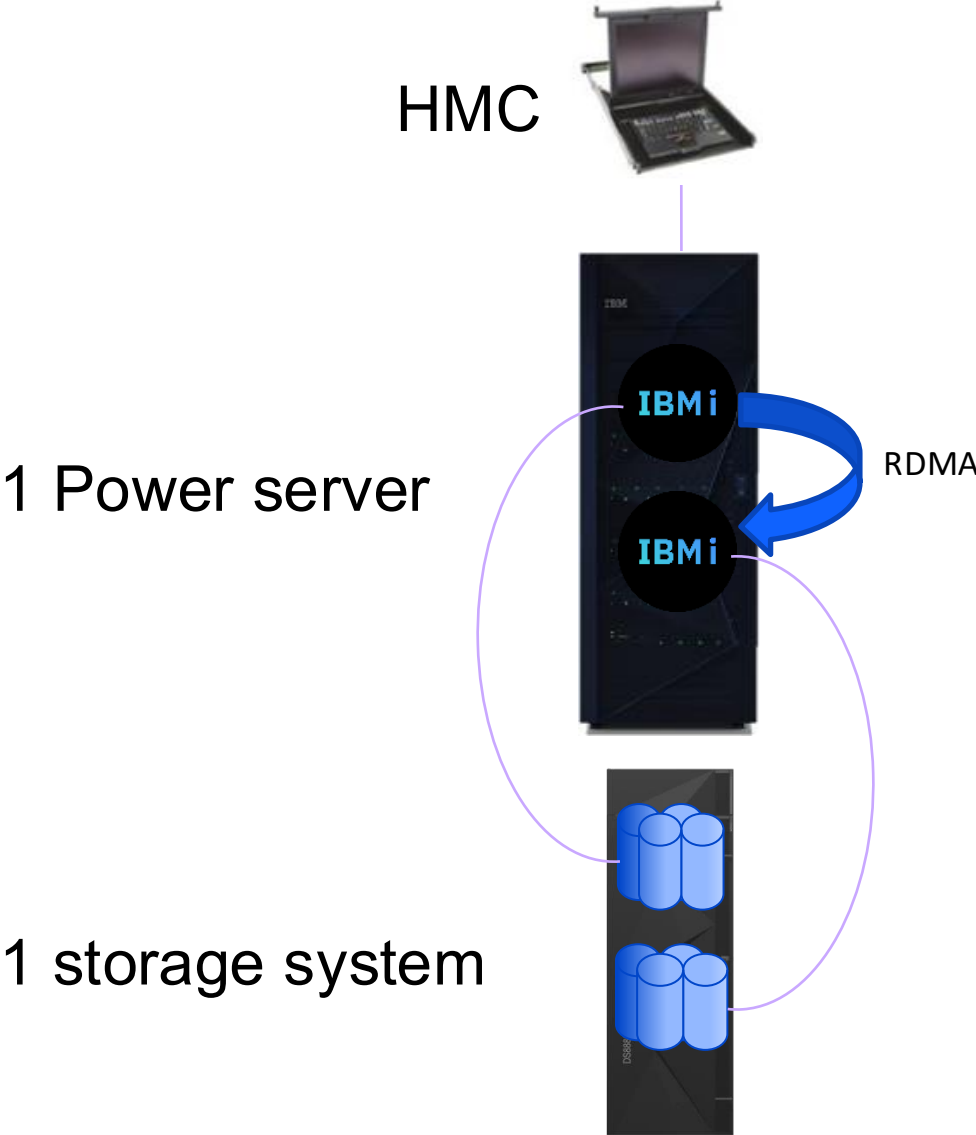
IBM Db2 Mirror for i Primary: RCHASTM5 Secondary: RCHASTM6

Network Redundancy Group

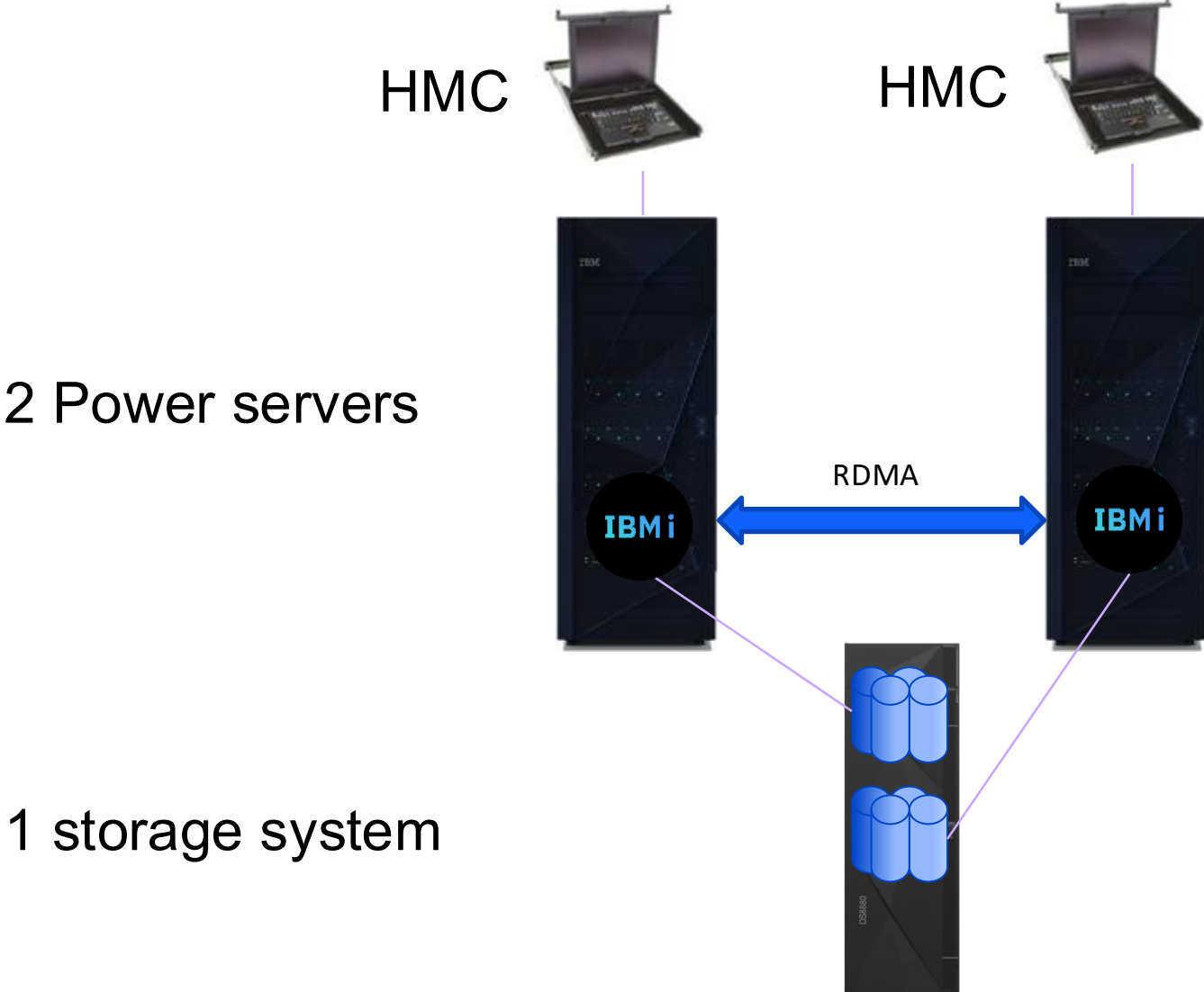
Primary - RCHASTM5 Secondary - RCHASTM6

Group	IP Address - RCHASTM5	Priority	Link State	IP Address - RCHASTM6
Database Replication	10.0.0.63	1	Up	10.0.0.73
	10.0.0.64	1	Up	10.0.0.74
	10.0.1.10	2	Standby	10.0.2.10
	10.0.2.20	2	Standby	10.0.1.20
Db2 Mirror Environment Manager	10.0.0.63	1	Up	10.0.0.73
	10.0.0.64	1	Up	10.0.0.74
	10.0.1.10	2	Standby	10.0.2.10
	10.0.2.20	2	Standby	10.0.1.20
IFS Replication	10.0.0.63	1	Up	10.0.0.73
	10.0.0.64	1	Up	10.0.0.74
	10.0.1.10	2	Standby	10.0.2.10
	10.0.2.20	2	Standby	10.0.1.20
System Object Replication	10.0.0.63	1	Up	10.0.0.73
	10.0.0.64	1	Up	10.0.0.74
	10.0.1.10	2	Standby	10.0.2.10
	10.0.2.20	2	Standby	10.0.1.20
Resynchronization	10.0.0.63	1	Up	10.0.0.73
	10.0.0.64	1	Up	10.0.0.74
	10.0.1.10	2	Standby	10.0.2.10
	10.0.2.20	2	Standby	10.0.1.20

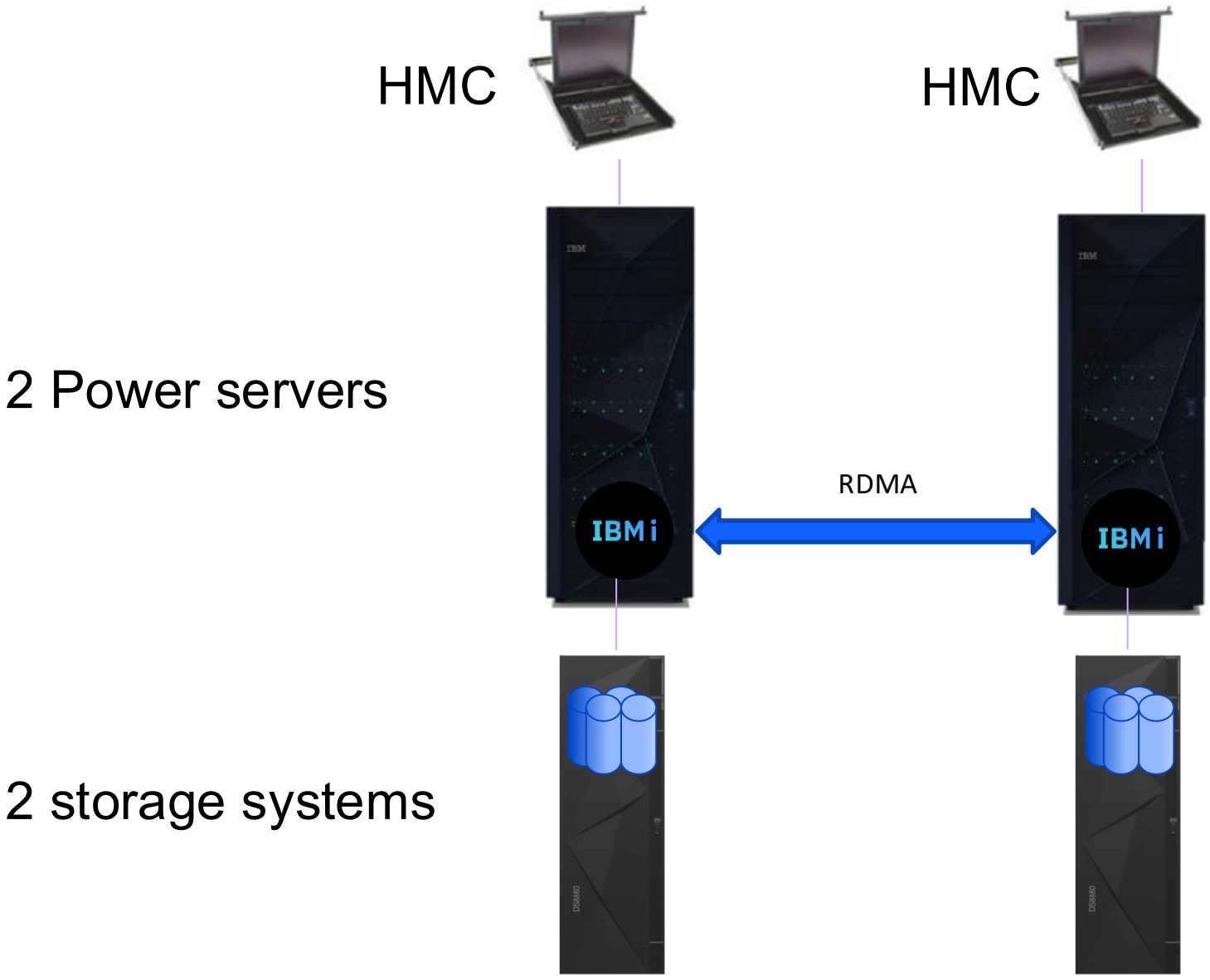
Small environment for functional test



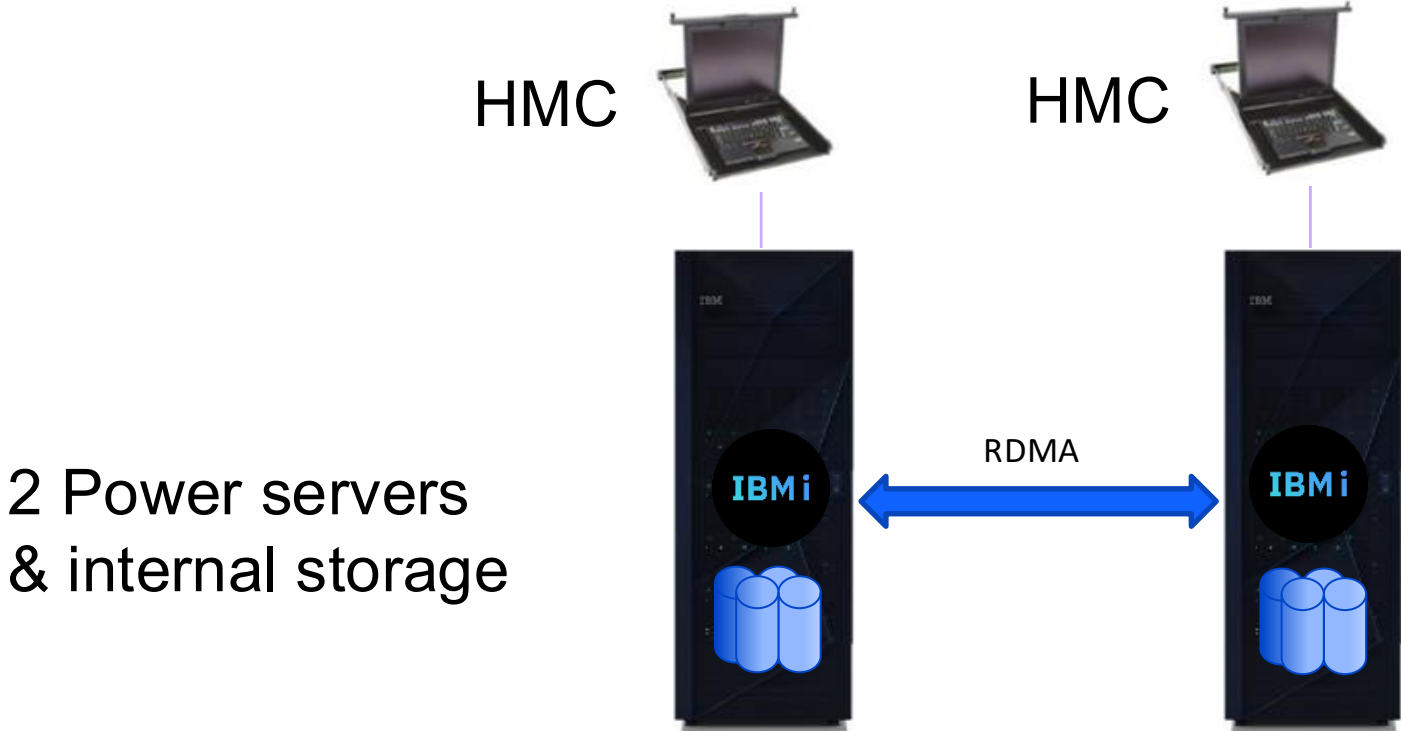
Server redundancy



Server and storage redundancy



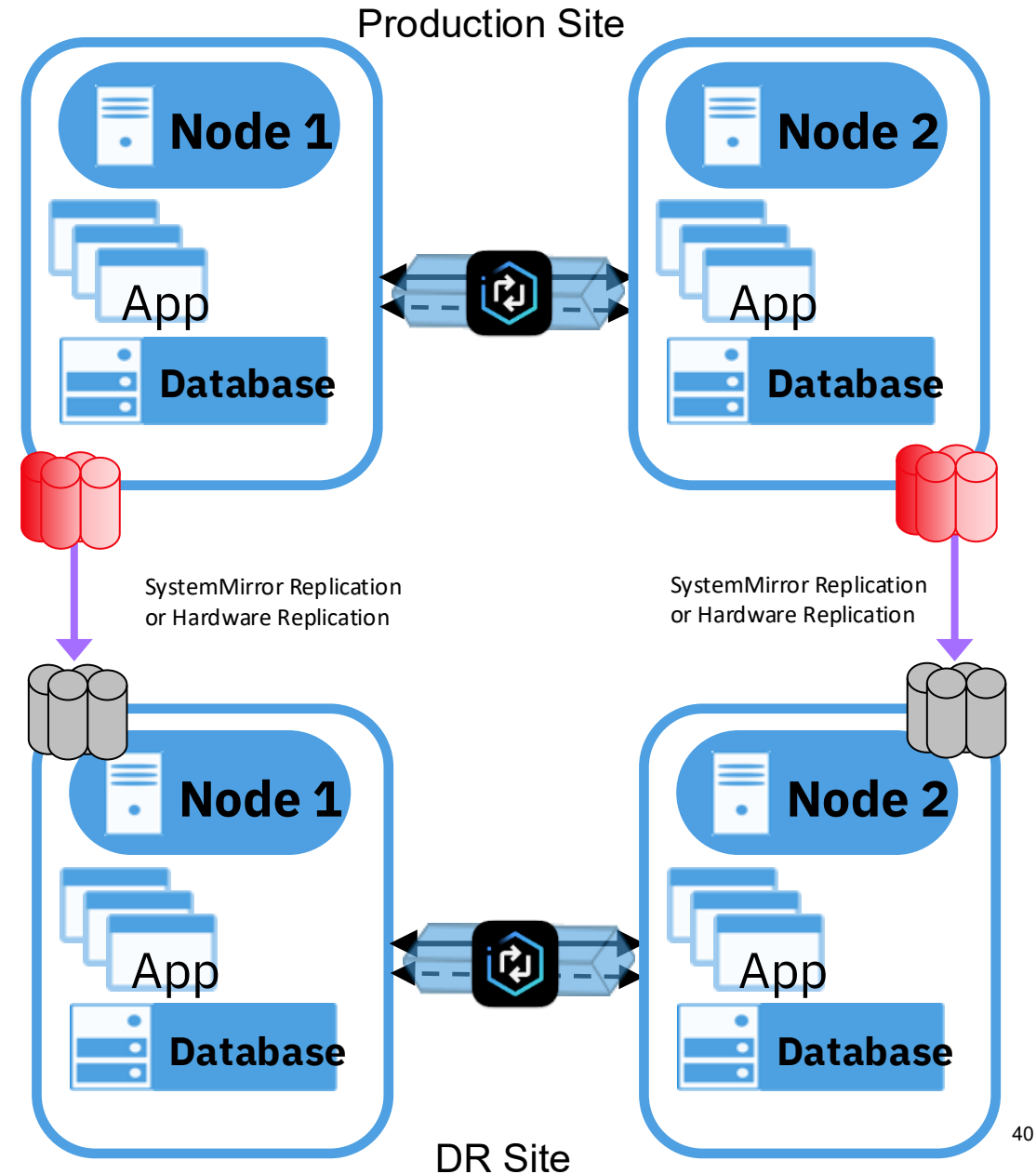
Server redundancy and internal storage



2 Power servers
& internal storage

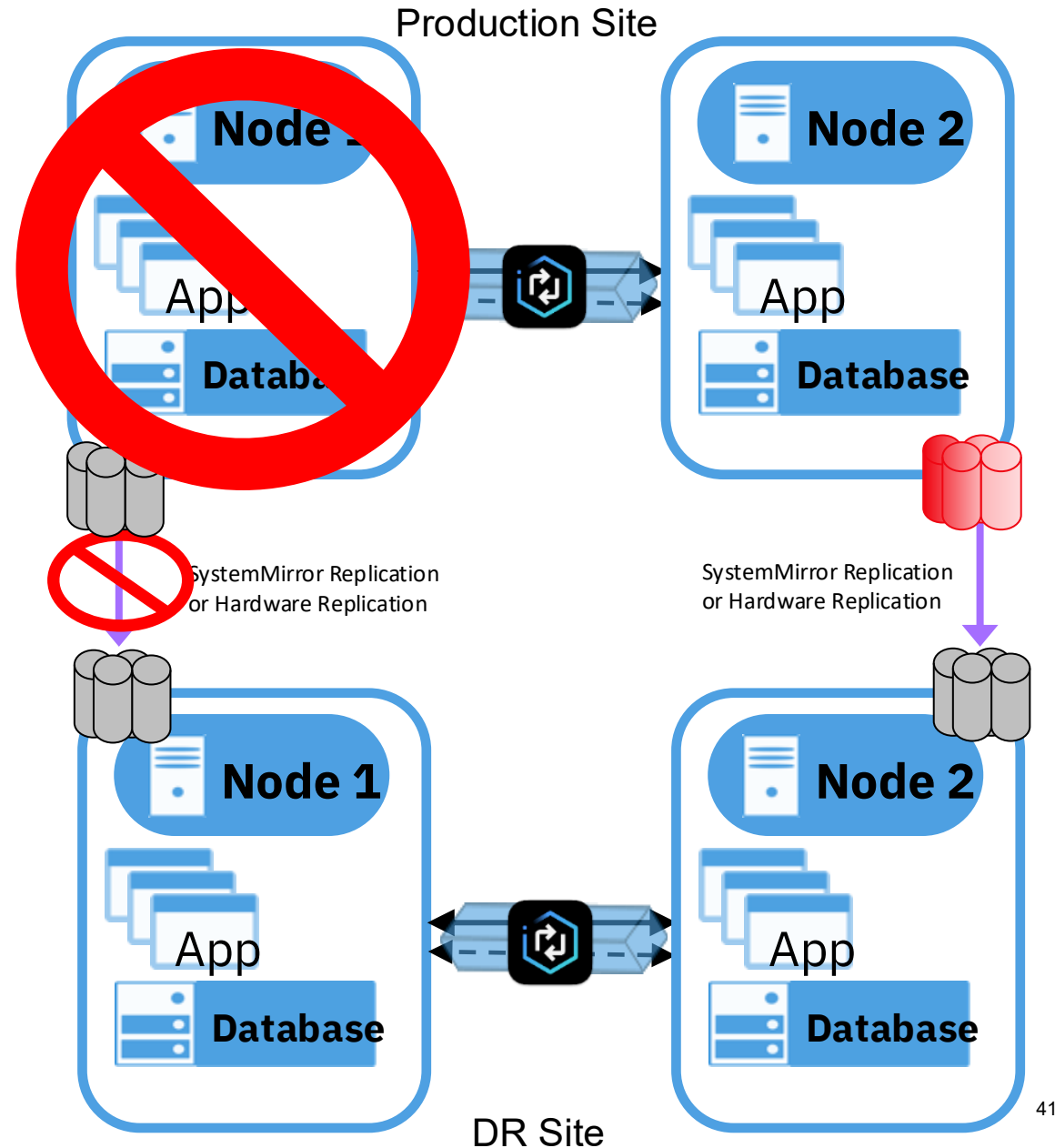
Planning for Disaster Recovery

- Production remains at production site as long as one Db2 Mirror node is up.
- If both production site nodes are unavailable, then a switch to the DR site can be initiated.
- Define a policy for manual or automatic switch to DR.
- Only one node at the DR site has the most recent copy of data when the switch occurs, so a Db2 Mirror resynchronization is needed to get both nodes at the DR site back in sync.



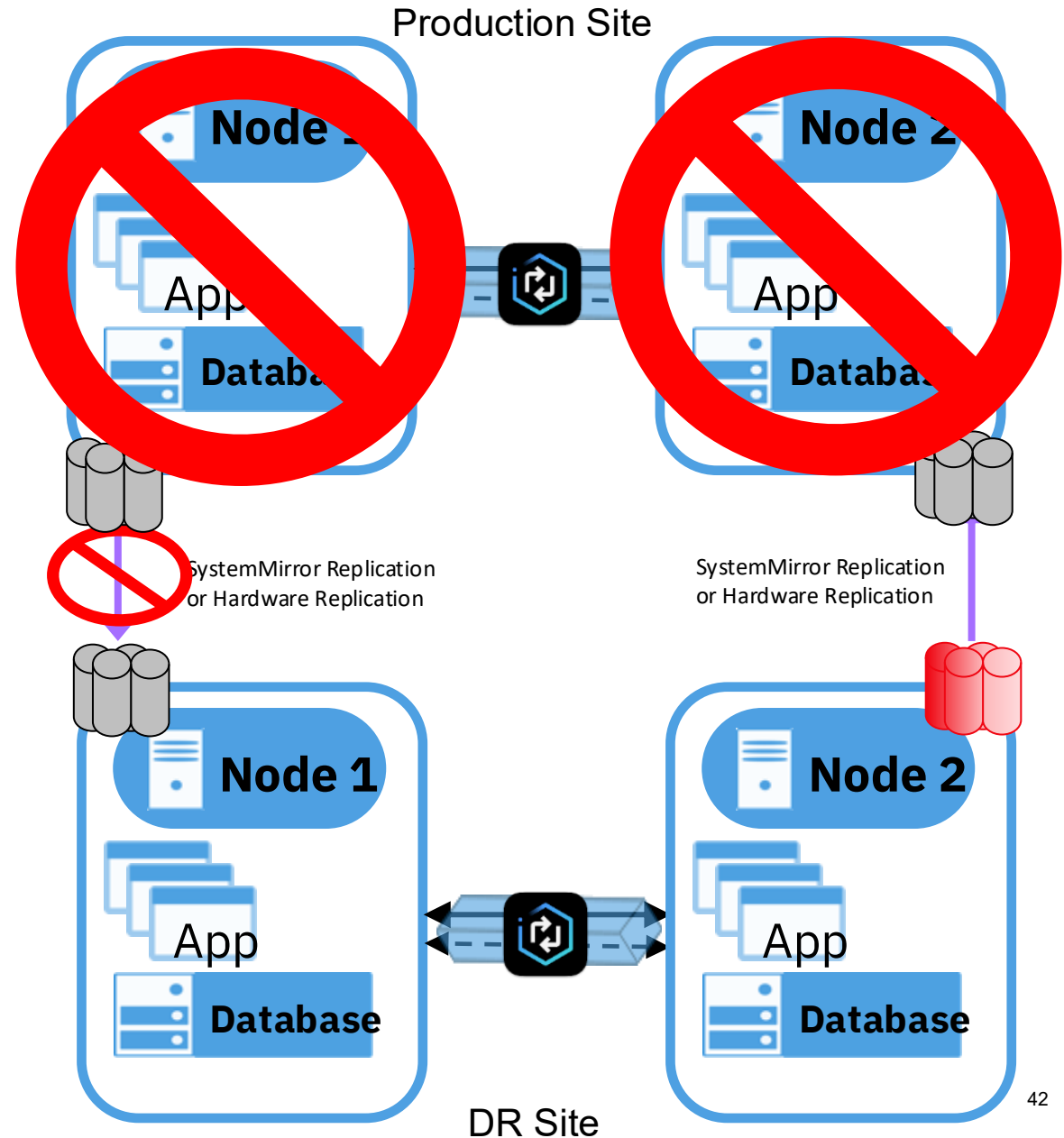
Planning for Disaster Recovery

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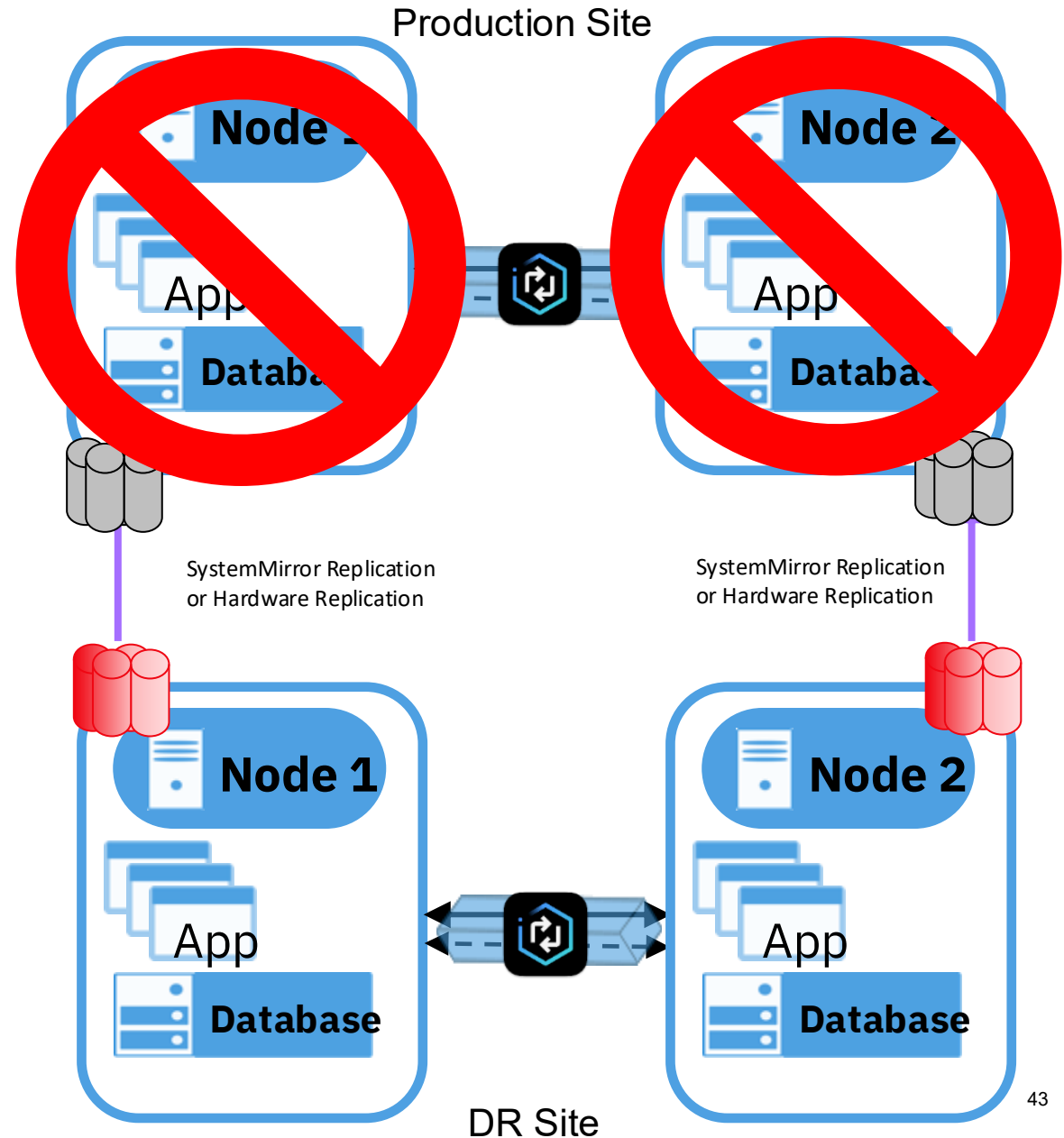
Planning for Disaster Recovery

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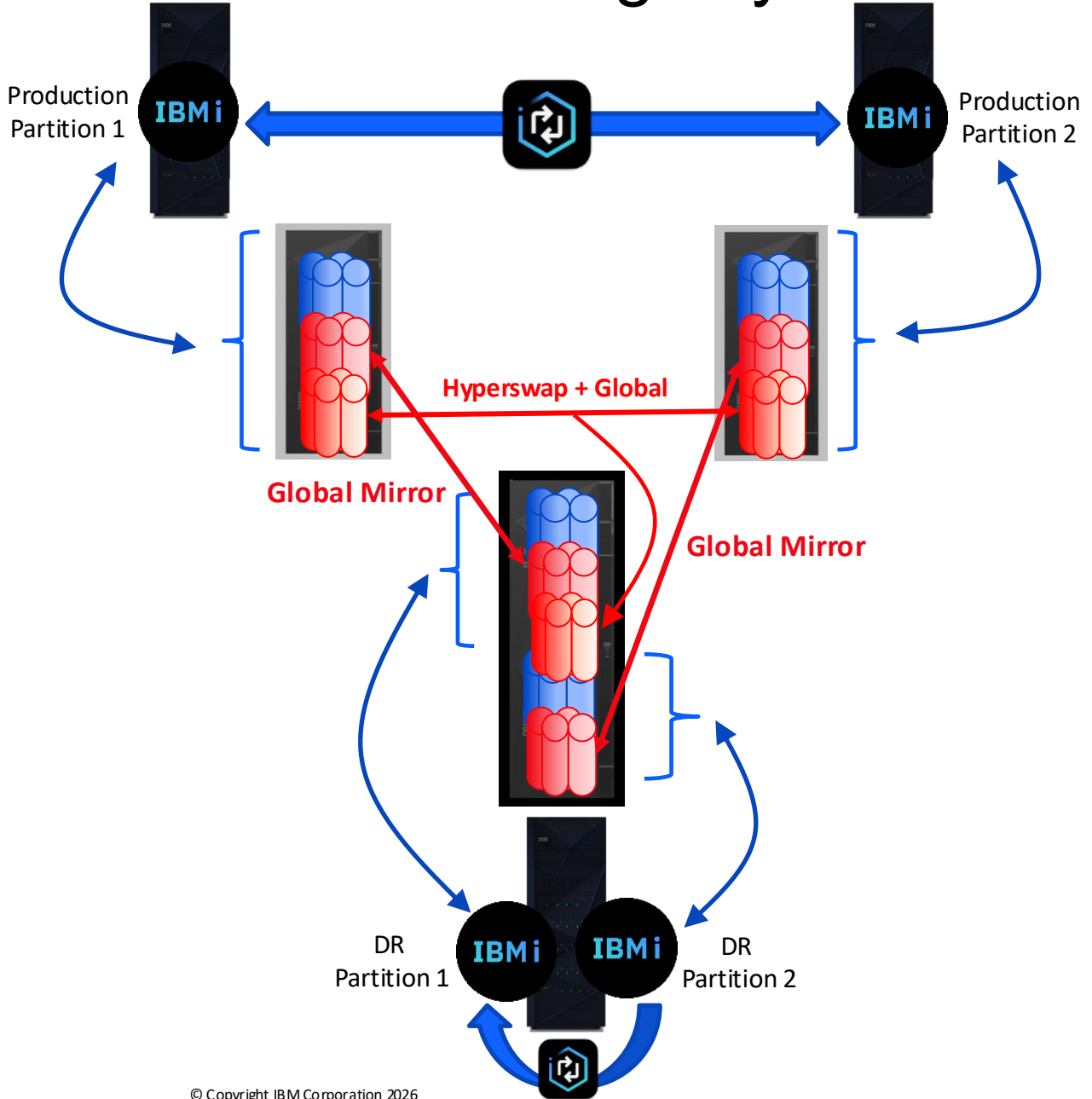


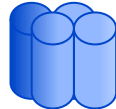


Planning for Disaster Recovery

- Production remains at production site as long as one Db2 Mirror node is up.
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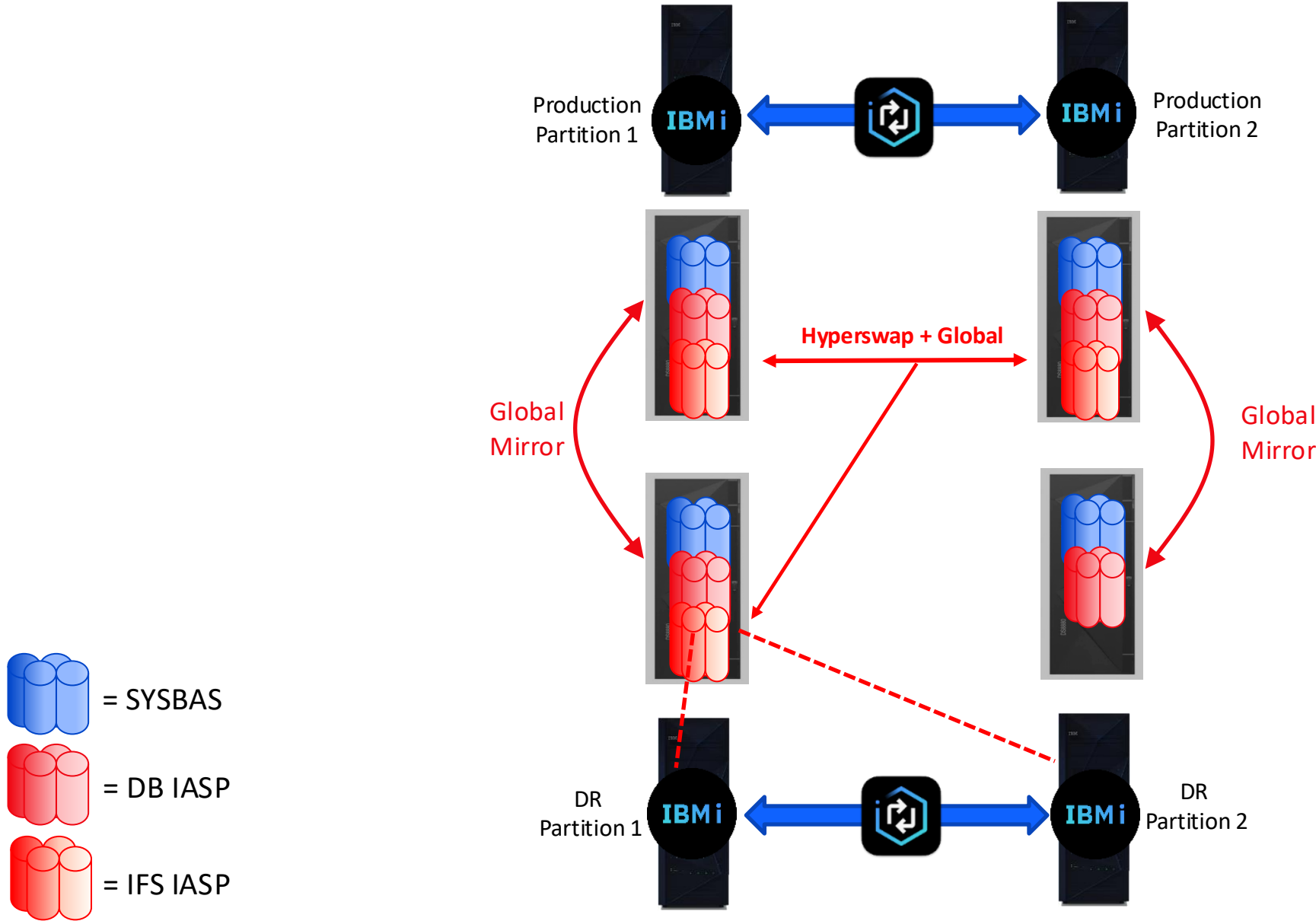


DR: 3 Power servers and 3 storage systems

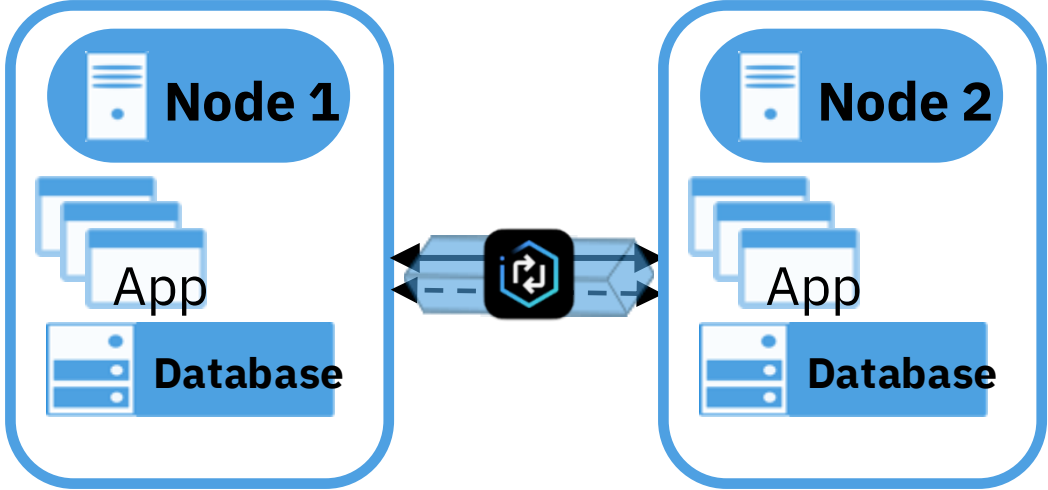


-  = SYSBAS
-  = DB IASP
-  = IFS IASP

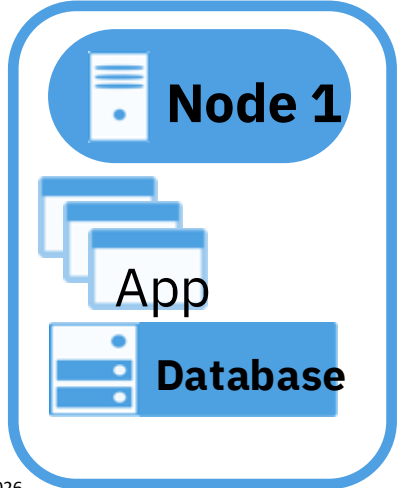
DR: 4 Power servers and 4 storage systems



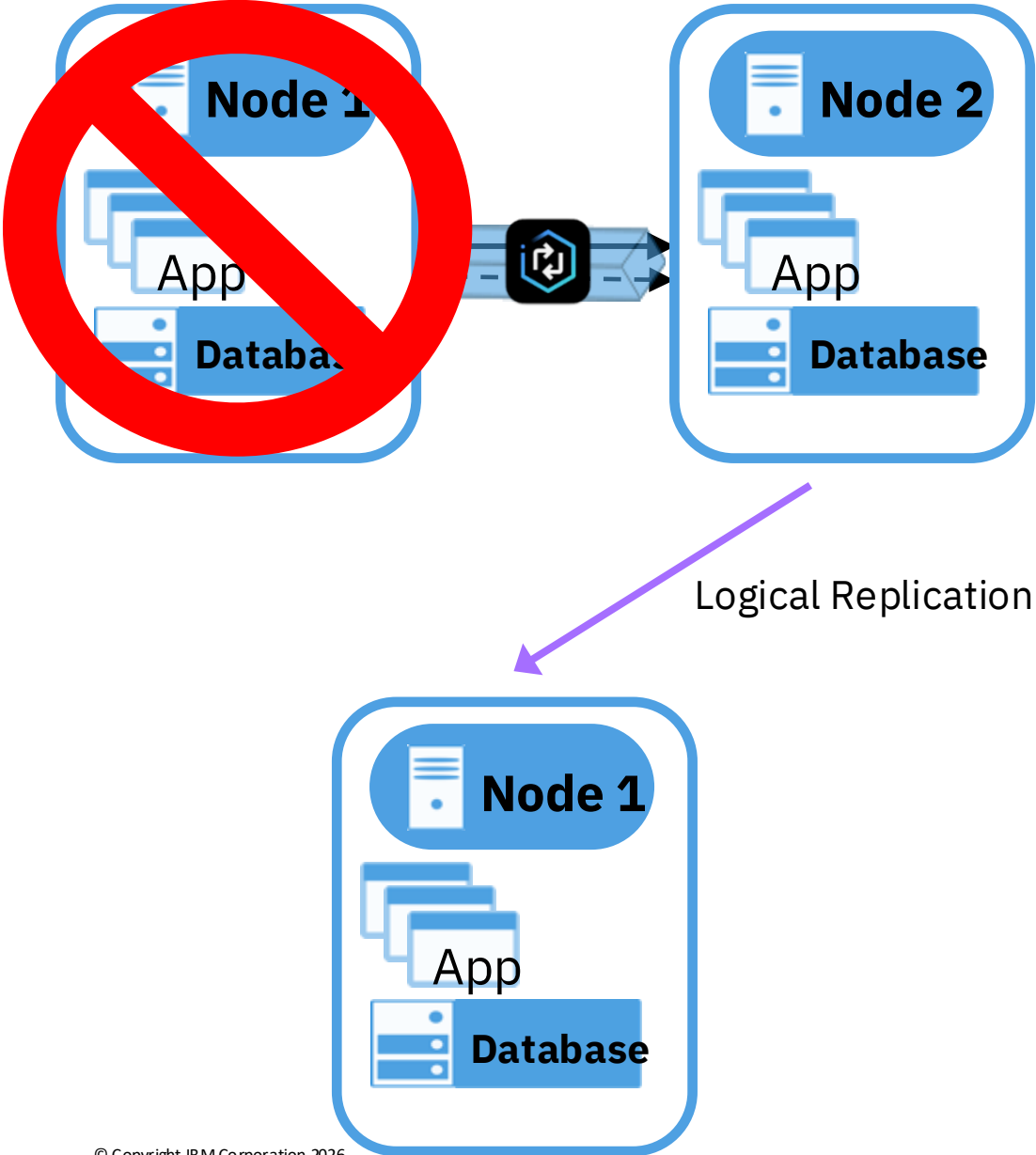
Logical Replication to Single DR Node



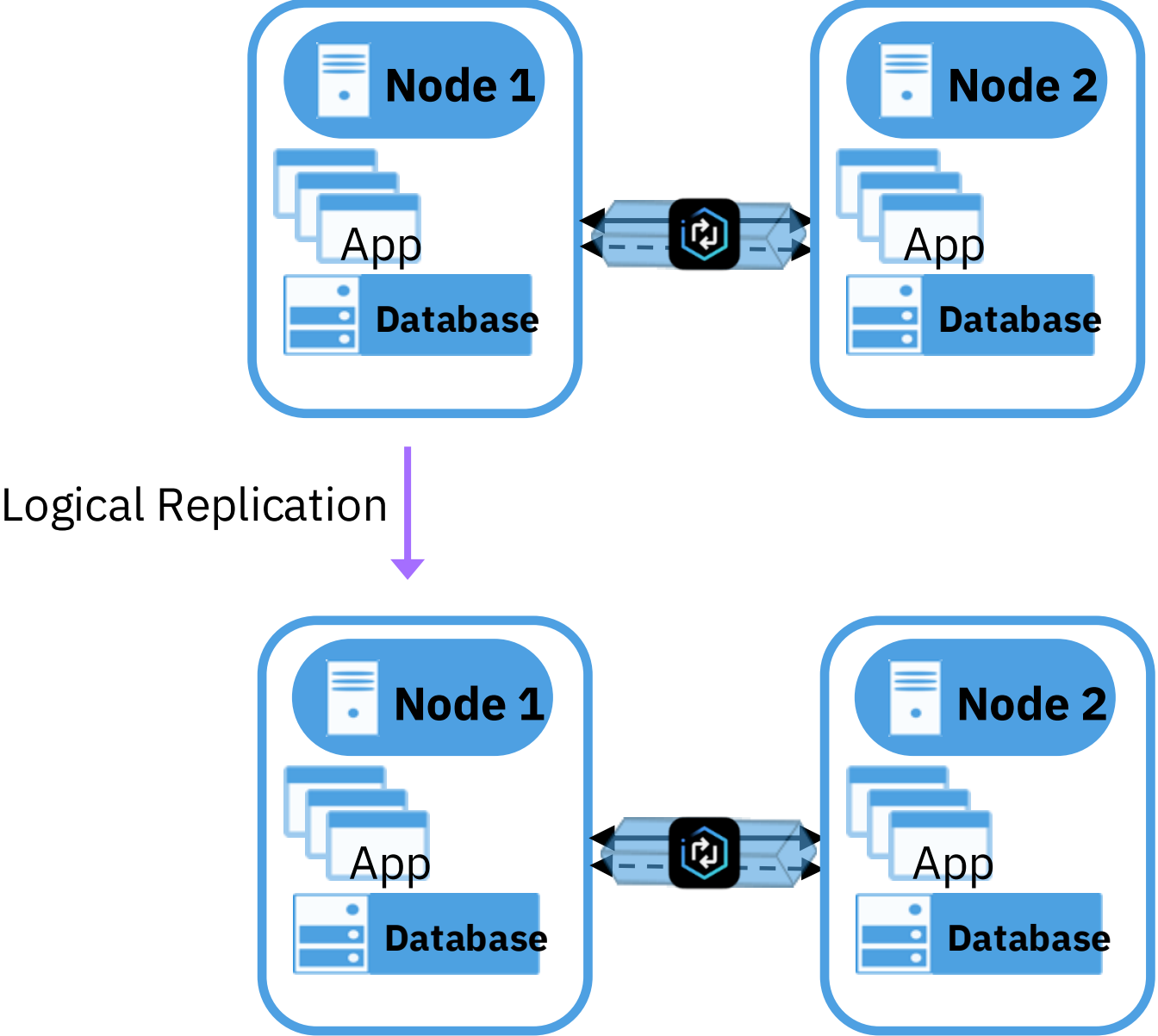
Logical Replication



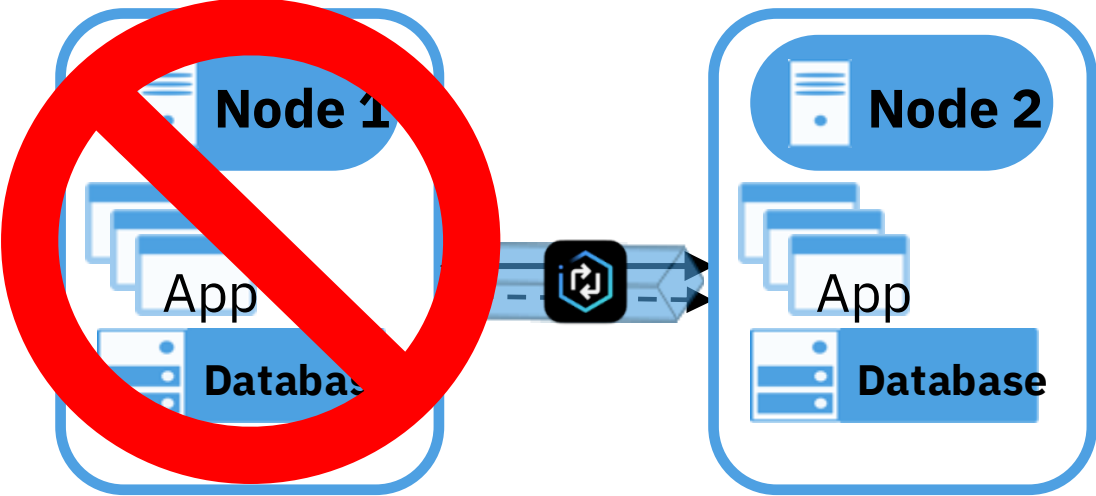
Logical Replication to Single DR Node



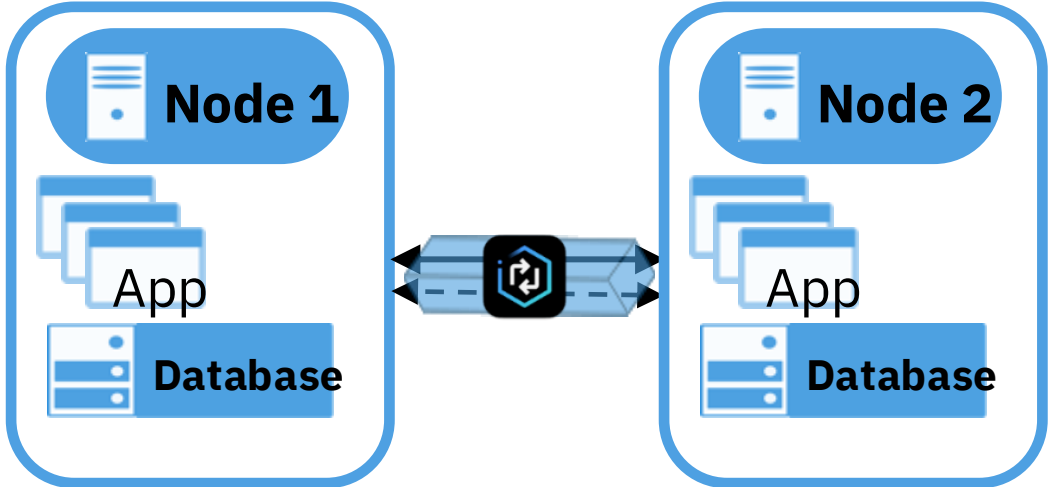
Logical Replication to Db2 Mirror DR



Logical Replication to Db2 Mirror DR



Logical Replication



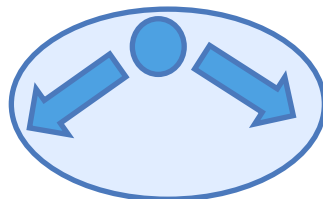
#4 Plan for application switching

- Load Balancer
- Takeover IP address groups
- JDBC Alternate Server
- Exit Programs
- Other approaches



Db2 Mirror – Active Active, Web Clients with Load Balancer

Web Clients

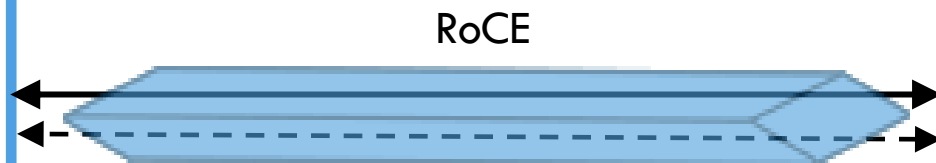


Load Balancer

Node 1

App

Database

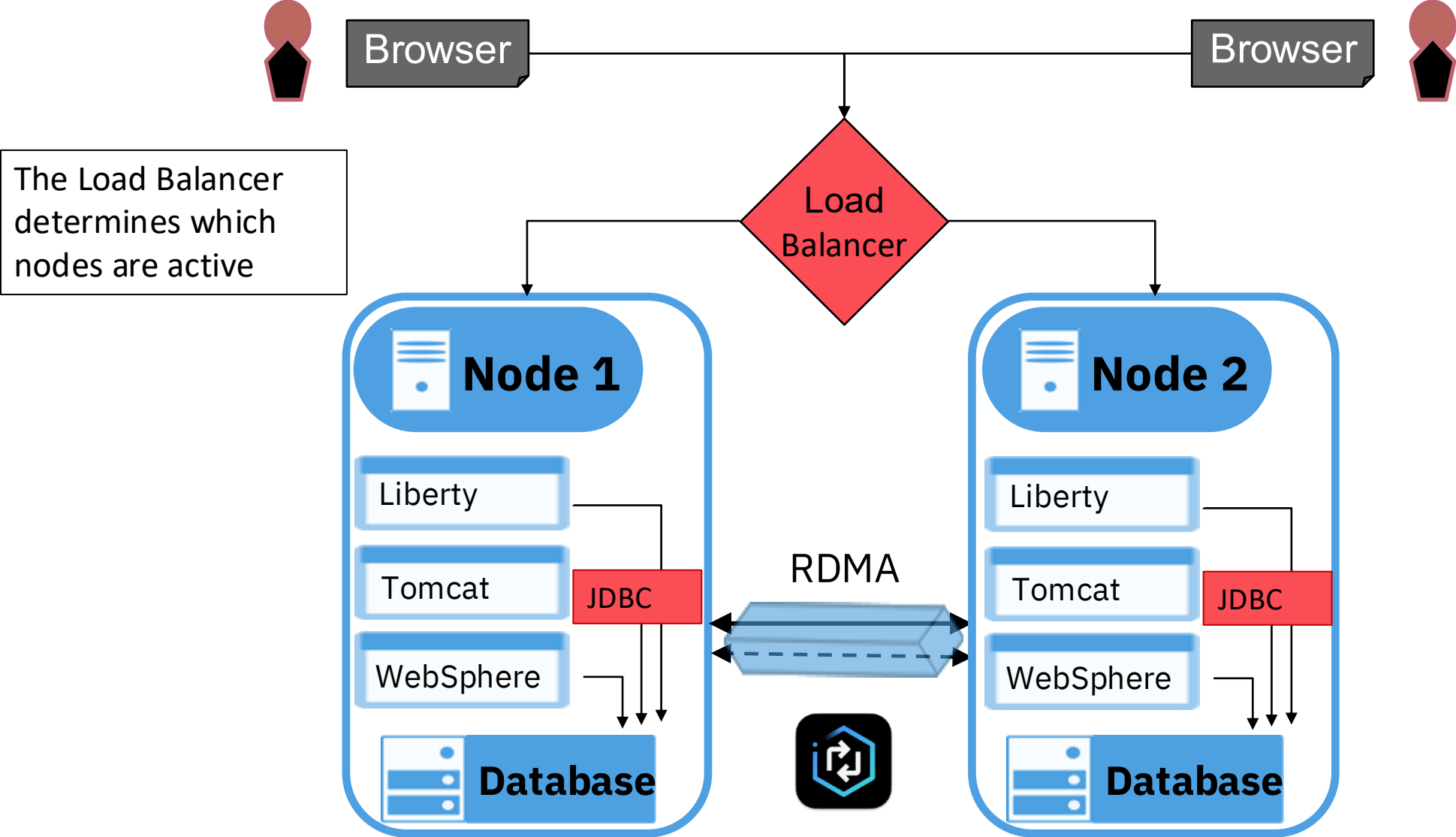


Node 2

App

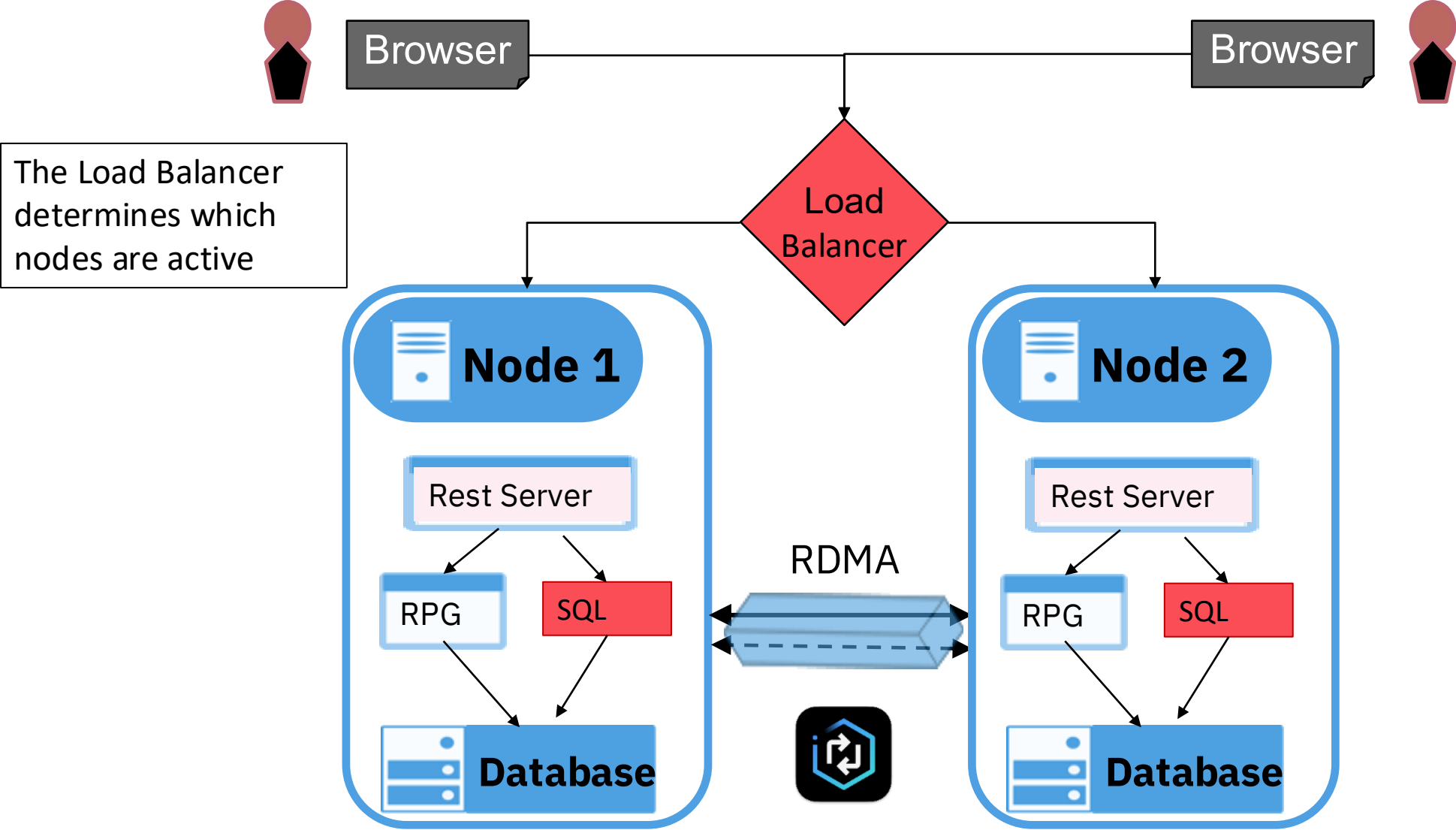
Database

Example Active/Active Web Application Implementation



Active/Active Web Application
Active/Active Database

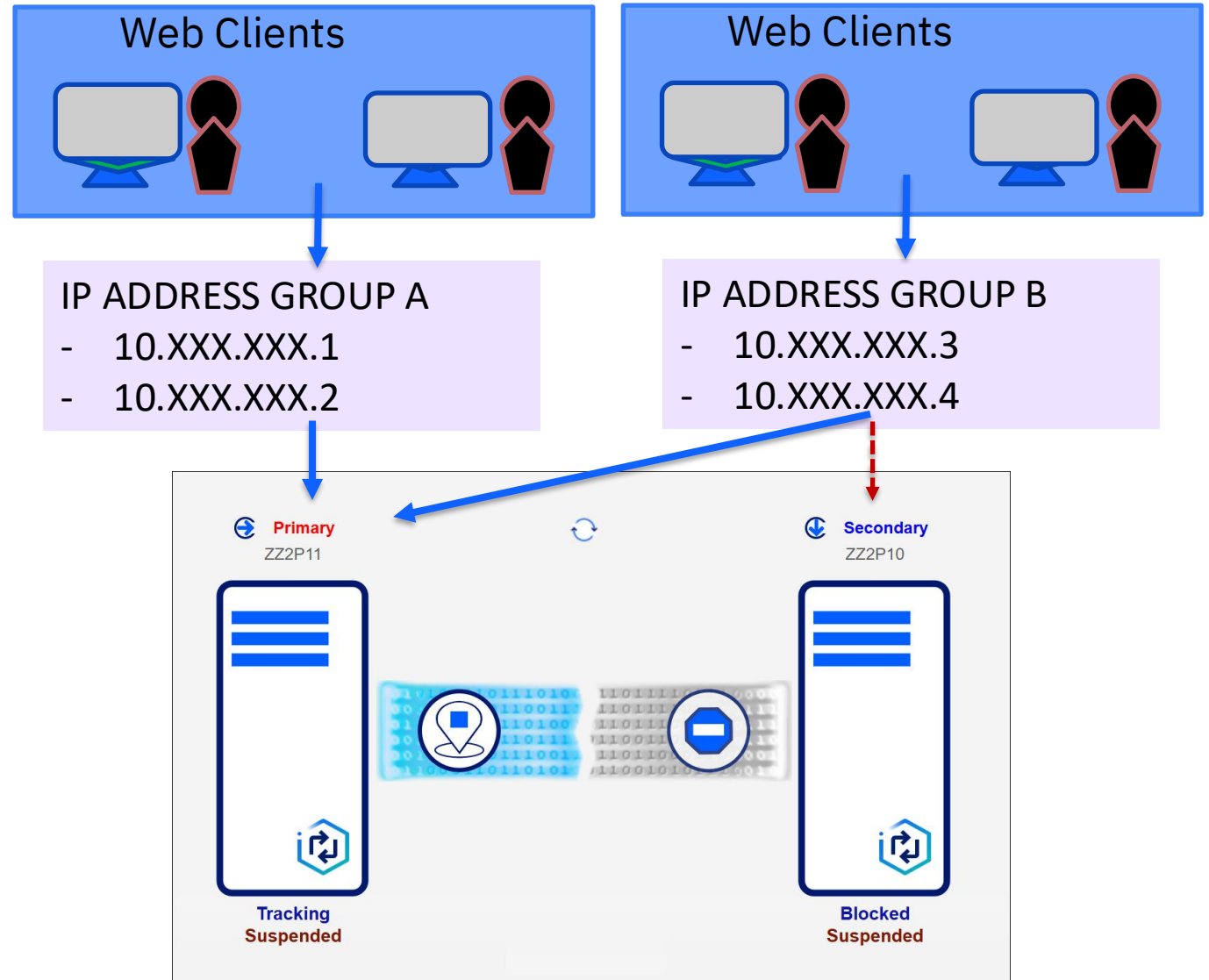
Example Active/Active REST Services Implementation



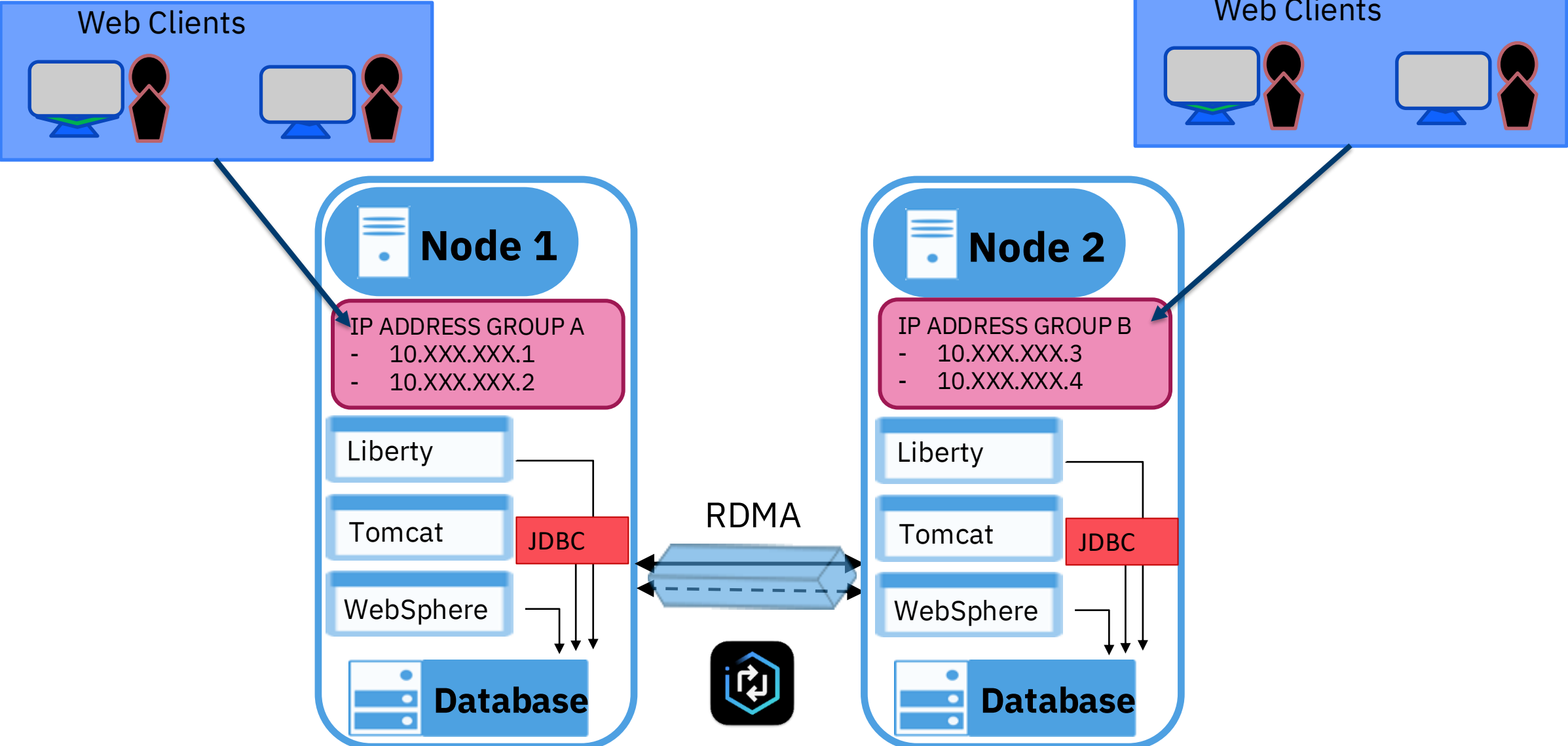
Active/Active REST Connection
Active/Active Database

Db2 Mirror Takeover IP Address Switching

- IP address groups switched between nodes by Db2 Mirror
- Automatic switch
 - When replication state is **BLOCKED**
 - When node becomes unavailable
- IP address group can be manually switched if necessary

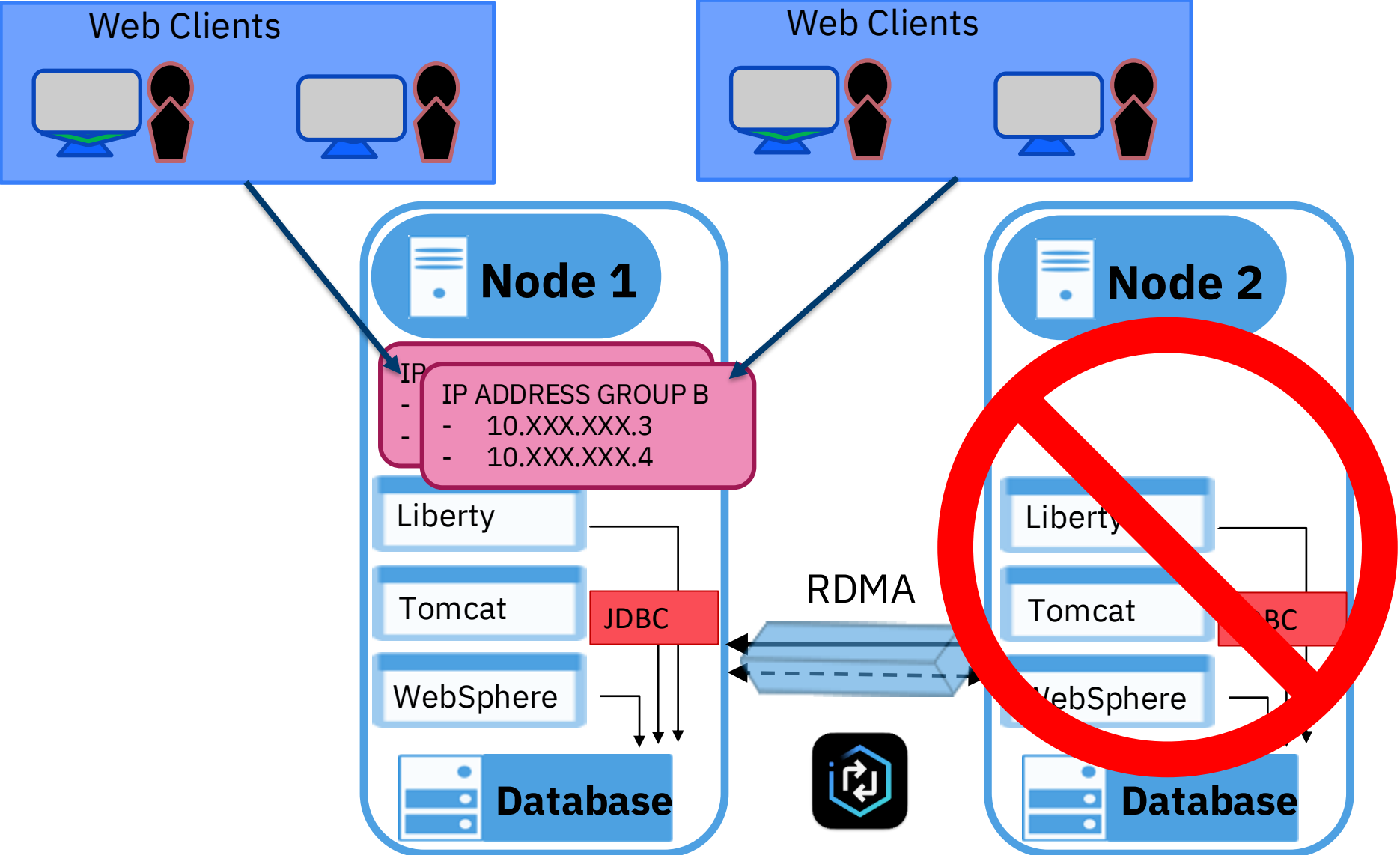


Takeover IP Address Switching Example



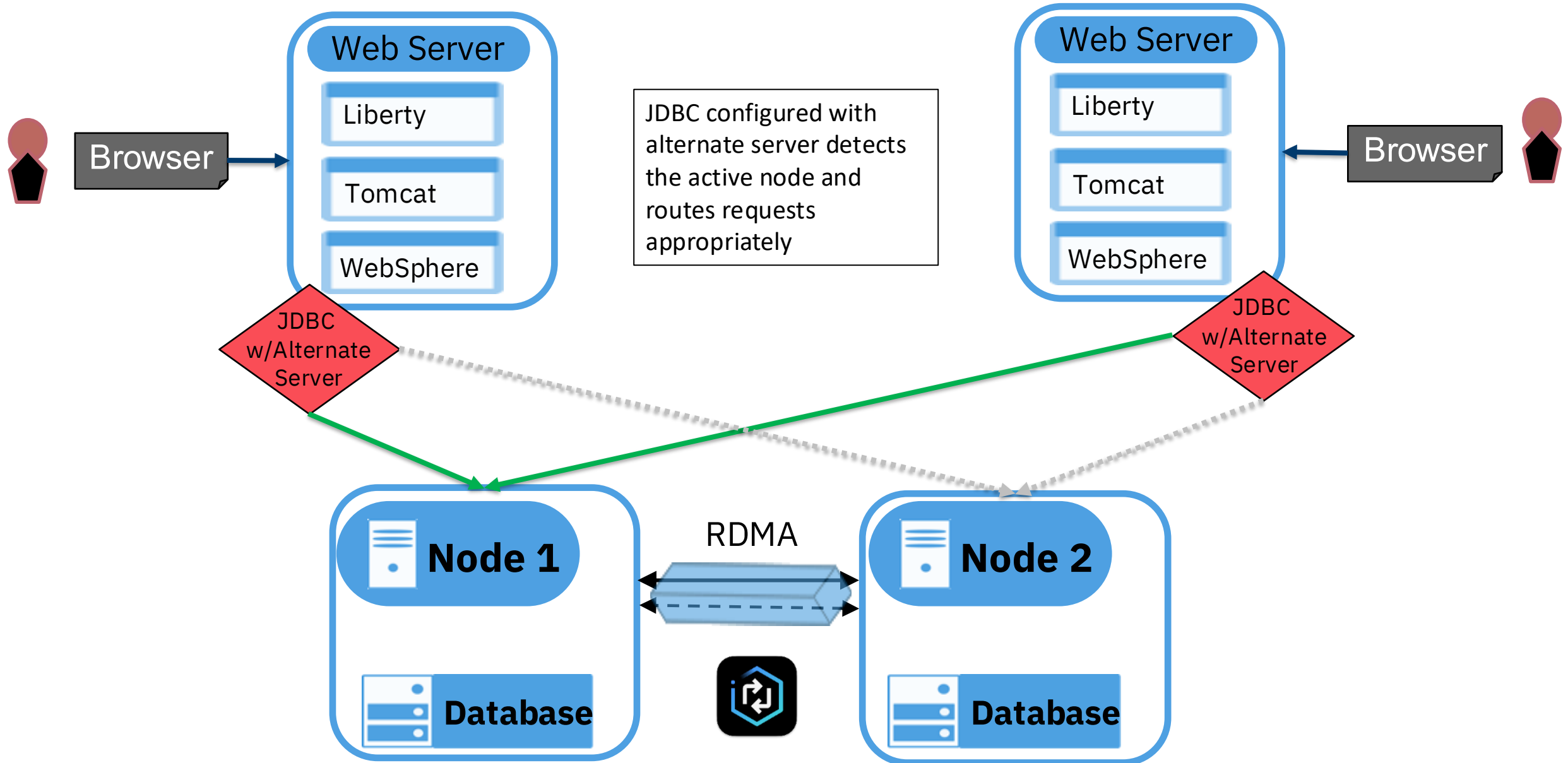
Active/Active Database

Takeover IP Address Switching Example



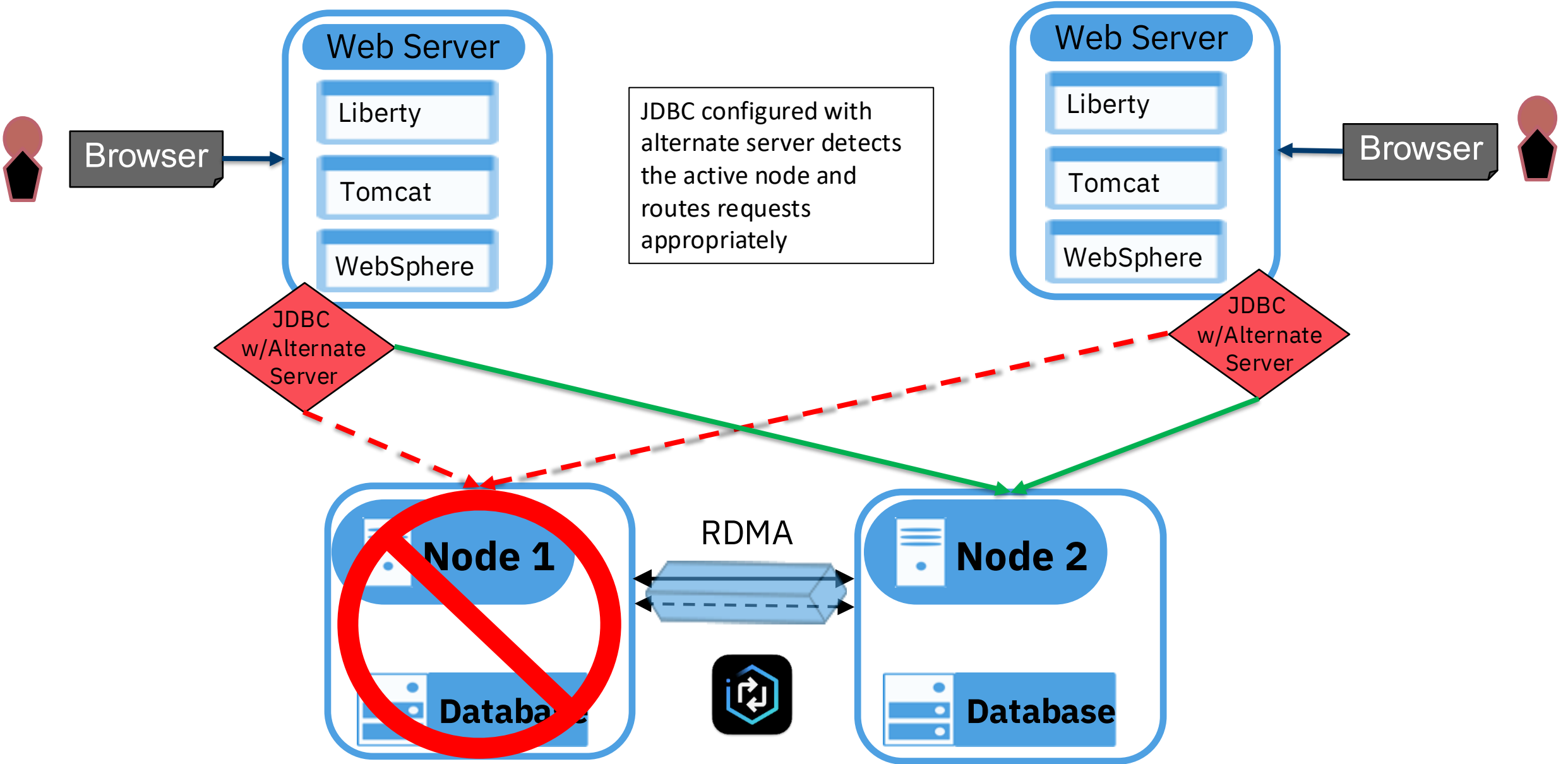
Active/Active Database

Another Web Application Implementation Example



Active/Active Database

Another Web Application Implementation Example



Active/Active Database

JTOpen JDBC alternate server properties

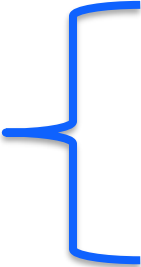


- **Before:**
 - JTOpen applications incur a failure when the connection drops
- **JTOpen 9.6:**
 - JTOpen applications can automatically reconnect
 - Controls:
 - List of alternate servers to use
 - Maximum # of retry attempts
 - Wait time between retry attempts
 - Whether to attempt to automatically switch back to preferred server

https://www.ibm.com/docs/en/ssw_ibm_i_76/db2mi/db2mappdevjtopen.htm

<https://jt400.sourceforge.net/doc/com/ibm/as400/access/doc-files/JDBCProperties.html#alternate>

QIBM_QMRDB_STATE_CHG exit point

Programmatically handle:

- **ACTIVE → BLOCKED** 
 - Non-replicated data can be read or changed
 - Replicated data can be read
 - Replicated data can not be changed
- **BLOCKED → ACTIVE**
(synchronizing) 
 - Non-replicated data can be read or changed
 - Replicated data can be read
 - Replicated data can be changed when resync for that object has completed
- **BLOCKED → ACTIVE**
(replicating) 
 - Resynchronization has completed

QIBM_QMRDB_STATE_CHG Format SCHG0200

Exit program called each time the replication state or replication detail changes for SYSBAS or any database independent auxiliary storage pool (IASP)

Parameter	Description	Valid Values
1	ASP group name DB IASP name or *SYSBAS	iasp-name *SYSBAS
2	Current replication state Identifies the current replication state for the IASP group or SYSBAS.	ACTIVE BLOCKED TRACKING NOT MIRRORED
3	Current replication detail Identifies the current replication detail for the IASP group or SYSBAS.	NONE REPLICATING SUSPENDED SYNCHRONIZING

https://www.ibm.com/docs/en/ssw_ibm_i_76/db2mi/db2mmonitorexits.htm

QIBM_QMRDB_ROLE_CHG Format RCHG0200

Parameter	Description	Valid Values
1	Current replication role Identifies the new (current) role for SYSBAS on this node.	PRIMARY SECONDARY
2	Previous replication role Identifies the previous role for SYSBAS on this node.	PRIMARY SECONDARY
3	Replication role change source Identifies the source of the replication role change for SYSBAS on this node	SYSTEM USER

- SYSTEM
 - automatic takeover for unplanned outages
 - automatic role swap for planned outages is enabled
- USER
 - role change initiated by Db2 Mirror GUI user
 - role change initiated by the QSYS2.SWAP_MIRROR_ROLES procedure

#5 Make application changes

- Changes you may need to make:
 - Use replication eligible object types
 - Use IASPs
 - Enable application switching

#6 Deploy a test environment

- Practice outages and role swaps
- Analyze performance

- Stay current with Db2 for i & Db2 Mirror for i PTF Groups

PTF Groups being released on July 24th, 2026

Db2 for i – SF99704 Level 33 (IBM i 7.4)

Db2 for i – SF99950 Level 12 (IBM i 7.5)

Db2 for i – SF99960 Level 3 (IBM i 7.6)

<https://www.ibm.com/support/pages/node/7251904>

Db2 Mirror – SF99668 Level 29 (IBM i 7.4)

Db2 Mirror – SF99951 Level 11 (IBM i 7.5)

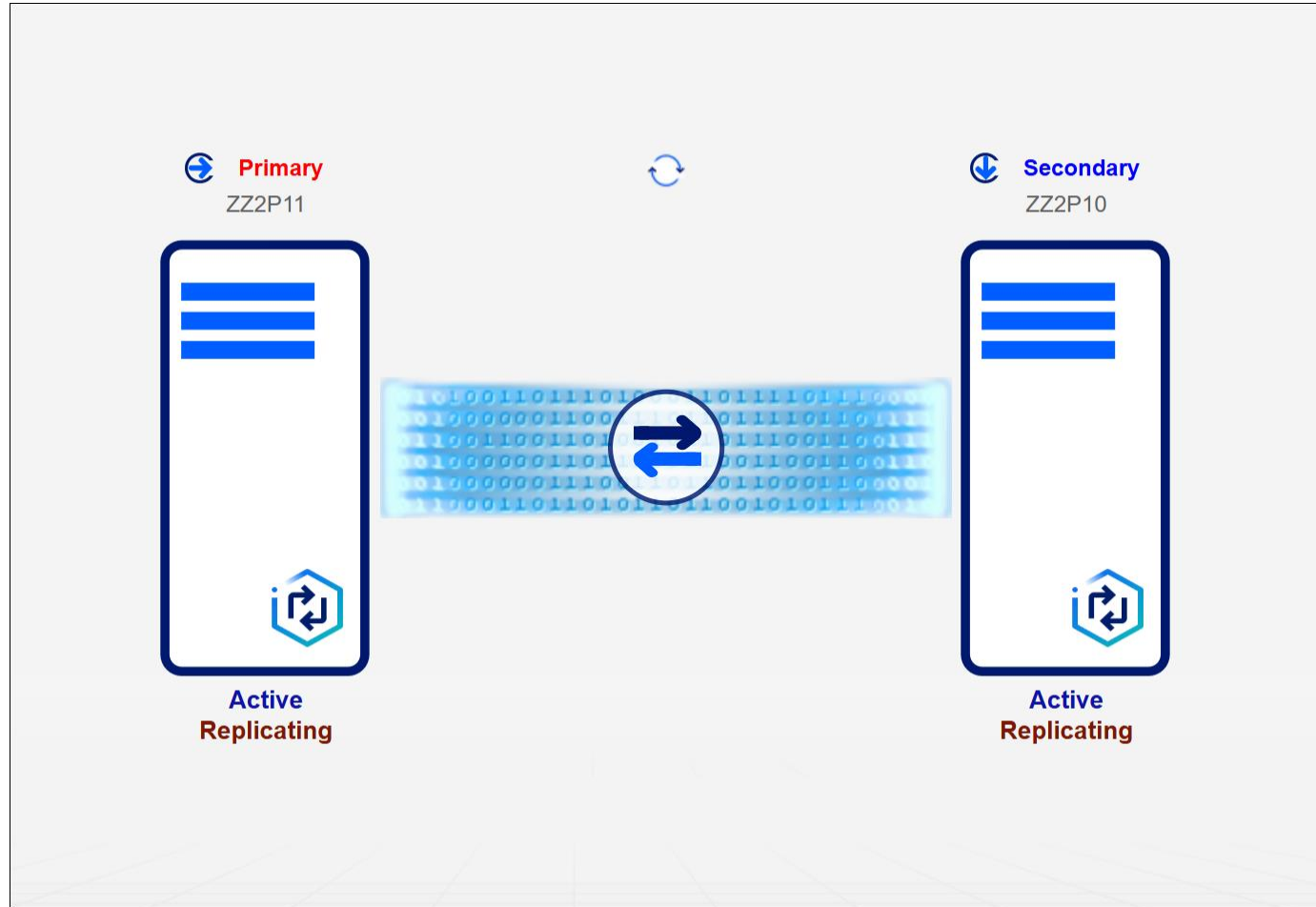
Db2 Mirror – SF99961 Level 3 (IBM i 7.6)

<https://www.ibm.com/support/pages/node/7252107>

Performance Expectations

- IBM Db2 Mirror for i: Performance Considerations
<https://www.ibm.com/downloads/cas/QYGKQJMK>
- Synchronous replication increases the complete path length of an operation since an action may drive I/O on both nodes in order to finish.
 - Could increase by up to $\sim(2-3)X$ for Db2 changes
- The ability to run transactions on both nodes should mitigate per transaction overhead and with a target of achieving equal to or greater transactional throughput
- Read workloads are not impacted since they are not replicated
- Single threaded or serial I/O workloads will be the most impacted

#7 Deploy in production



Db2 Mirror for i Readiness Assessment

Overview

This readiness assessment will help you develop the skills required to implement a Db2 Mirror solution and provide a test environment for evaluating key applications and databases. The assessment is customized to your requirements, but generally takes between two and three weeks.

Target Audience

- ISVs and clients that are planning to enable their applications and infrastructure for Db2 Mirror for IBM i

Why Use This Service?

- Are you looking for an alternative to your current IBM i software replication solutions for high availability?
- Do you need a zero-time failover environment to an active high availability system?
- Are your business users asking for an active/active solution for their critical applications?

Benefits

- This service will help you prepare for a continuous availability solution for your applications
- It will help you address the active/active application requirements of your business users

Service Provided

- Develop a customized plan for infrastructure and database to support Db2 Mirror including the following options:
 - Planning
 - Implementation
 - Application compatibility
 - Performance optimization
 - Fail over testing
- Create an IBM i test infrastructure environment based on Power servers with DS8000 and SVC/Flash storage options
- Create a test database environment with sample application and data, cloned to create a Db2 Mirror solution (Note that no HIPAA or PHI client data can be loaded on IBM systems)
- Analyze and optimize application performance
- Perform fail over testing

Deliverables

- Analysis of infrastructure, database and application considerations for a successful implementation of Db2 Mirror
- Design for infrastructure (compute and storage), including PowerHA, Metro and Global Mirror integration where applicable
- Design for database and applications to best exploit Db2 Mirror
- Recommendations for application and database modernization for optimal performance in a mirrored database environment
- Skills enablement and guidance on best practices for Db2 Mirror

Contacts

- Contact us at ibmsls@ibm.com or your local Technology Expert Labs team
- Principal Technology Experts Lab consultant:
Selwyn Dickey
sdickey@us.ibm.com

For more information

IBM Sites:

IBM i Home Page	https://www.ibm.com/it-infrastructure/power/os/ibm-i
IBM Strategy Whitepaper	https://www.ibm.com/it-infrastructure/us-en/resources/power/i-strategy-roadmap/
IBM Client Success	https://www.ibm.com/it-infrastructure/us-en/resources/power/ibm-i-customer-stories/
Support Life Cycle	https://www.ibm.com/support/lifecycle/
License Topics	https://www-01.ibm.com/support/docview.wss?uid=nas8N1022087
IBM i Release Life Cycle	https://www.ibm.com/support/pages/release-life-cycle
IBM i TR Wikis	IBM i Technology Updates

For more information:

Blogs to follow

- [TechChannel You and i \(Steve Will\)](#)
- [TechChannel: i Can \(Dawn May\)](#)
- [TechChannel: OpenYour i with Jesse Gorzinski](#)
- [IBM Db2 for i \(Kent Milligan\)](#)
- [IBM i Analytics Blog \(Jon Westcott Jr\)](#)
- [iSee with Scott and Tim](#)

More to follow

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[@LinuxIBMMag](#)
[@OpenPOWERorg](#)
[@ITJungleNews](#)
[@SAPonIBMi](#)
[@SiDforIBMi](#)
[@IBMAIXeSupp](#)
[@IBMAIXdoc](#)

Hashtags to Use

#IBMPower
#IBMi
#IBMAIX
#Power10
#LinuxonPower
#HANAonPower
#ITInfrastructure
#OpenSource
#HybridCloud

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