Nimbra Vision Server Failover Use Cases

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Abstract

This document presents some different strategies in setting up server failover in Nimbra Vision. It also presents different fault user cases

Table of Contents

1 General

1.1 Scope

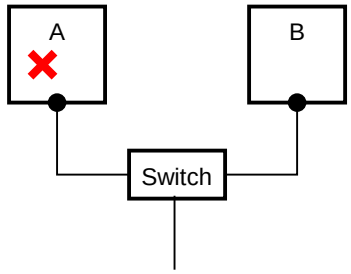
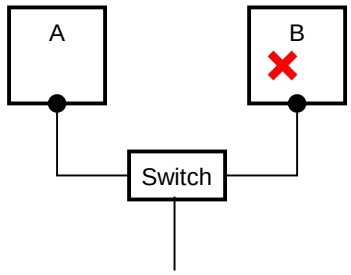
This document presents some different strategies in setting up server failover in Nimbra Vision. It also presents different fault user cases.

1.2 Revision history

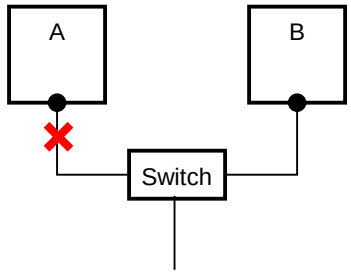
Date	Version	Responsible	Changes
2009-01-08	PA1	Jan Burgos	- Initial draft.

2 Hosts interconnected via switch, database via external IP

- Servers are connected to their databases via external IP address.
- Hosts are connected to each other and the rest of the network via an Ethernet switch.
- Switch is single point of failure.

Use Case 1. Primary host or service goes down 	At fault: - B goes from standby to primary. - Clients reconnect with B. At fault correction: - Database at A synchronizes with B (database replication). - A becomes standby when started. Conclusion: - Service is not interrupted. - Fault correction may include start of necessary service on A. This depends on the cause of the problem. However, if A just reboots, then manual intervention should not be required.
Use Case 2. Standby host or service goes down. 	At fault: - A remains primary. - Standby service is unavailable. At fault correction: - Standby service is restored. Conclusion: - Service is not interrupted.

Use Case 3. Network to primary server goes down.

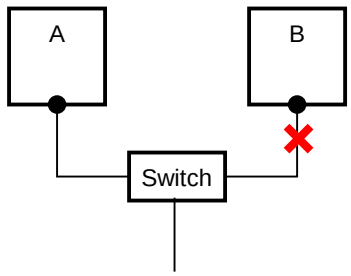


At fault:
- A goes down because it looses contact with its database.
- B goes from standby to primary.
- Client reconnects to B.

At fault correction
- B remains as primary
- Database at A resynchronizes with B (database replication).
- When replication is completed, A needs to be started and will take role as standby.

Conclusion:
- Service is not interrupted.
- Requires manual start of A to restore standby service.

Use Case 4. Network to standby server goes down.

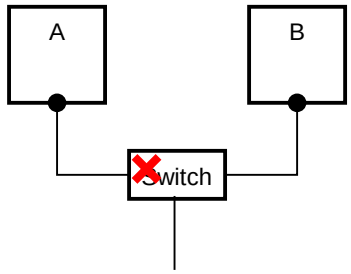


At fault:
- A remains primary.
- B goes down because it looses contact with the database.

At fault correction:
- Database B resynchronizes with A (database replication).
- When replication is completed, B needs to be started and will resume role as standby.

Conclusion:
- Service is not interrupted.
- Requires manual start of B to restore standby service.

Use Case 5. Network stops switching data.

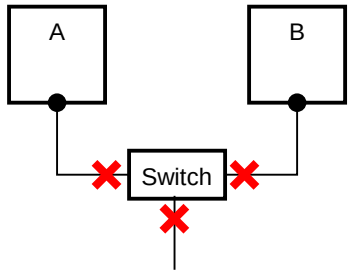


At fault (assume links are not detected as down):
- A remains primary.
- B goes to from standby to primary

At fault correction
- A synchronizes state with monitored nodes.
- B synchronizes state with monitored nodes.
- Replication is stopped (because A and B are simultaneously running as primary).
- Clients reconnect with B.
- The sysadmin needs to select one of the servers as primary (probably B), and reconfigured the other for replication and standby.

Conclusion:
- **Service is interrupted** while the fault exists.
- Requires reconfiguration to restore standby service.

Use Case 6. Switch and links goes down.



At fault (where switch dies, e.g. power loss):
- A goes down.
- B goes down.

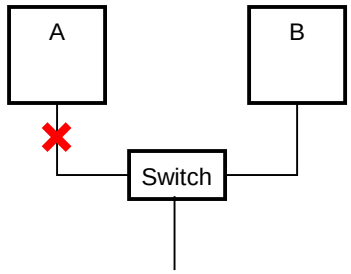
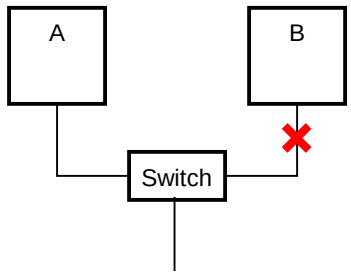
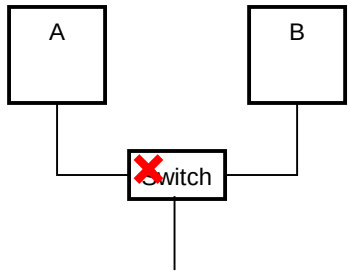
At fault correction:
- A and B remains down and requires manual restart.

Conclusion:
- **Service is interrupted** even after the fault is corrected.
- Requires start of primary and secondary server to restore service.

3 Hosts interconnected via switch, database via localhost

Note: Use Case 1 and Use Case 2 also applies to this setup.

- Servers are connected to their database via localhost.
- Switch is single point of failure.

Use Case 7. Network to primary server goes down. 	At fault: - A remains primary. - B goes from standby to primary. - Clients reconnect with B. At fault correction: - A synchronizes with monotored nodes. - Replication is stopped (because A and B are simultaneously running as primary). - The sysadmin needs to select one of the servers as primary (probably B), and reconfigured the other for replication. Conclusion: - Service is not interrupted. - Requires reconfiguration to restore standby service.
Use Case 8. Network to standby goes down. 	At fault: - A remains primary. - B goes from standby to primary. At fault correction: - B synchronizes with monitored nodes - Replication is stopped (because A and B are simultaneously running as primary). - The sysadmin needs to select one of the servers as primary (probably A), and reconfigured the other for replication. Conclusion: - Service is not interrupted. - Requires reconfiguration to restore standby service.
Use Case 9. Switch is down 	At fault: - A remains primary. - B goes from standby to primary. At fault correction: - Clients reconnect with B. - Replication is stopped (because A and B are simultaneously running as primary). - The sysadmin needs to select one of the servers as primary (probably B), and reconfigured the other for replication and standby. Conclusion: - **Service is interrupted** while the fault exists. - Requires reconfiguration to restore standby service.

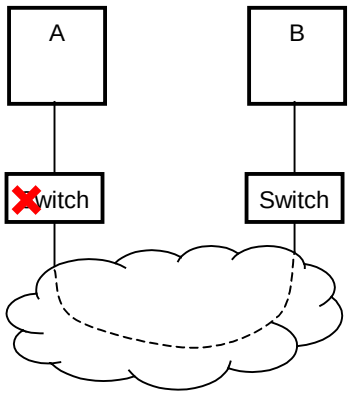
4 Hosts interconnected via network, database via localhost

Note: Use Case 1 and Use Case 2 also applies to this setup.

Note: If database is accessed via external IP address instead of localhost, then Use Case 3 and Use Case 4 also applies.

- This setup would be used if it is required that the primary and standby server are located at different sites (e.g. different cities).
- The hosts are interconnected via a network. The network must bandwidth to allow database replication!
- This configuration is sensitive of the quality of the interconnecting network. A tradeoff must be done between speed for the standby to detect a failing primary server, and robustness against temporary network problems that should not result in failover.

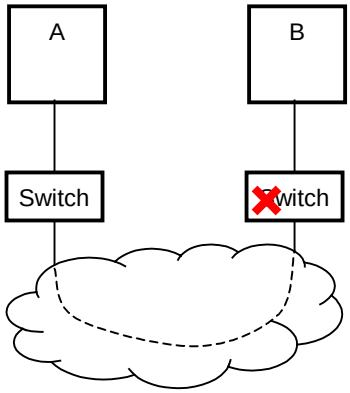
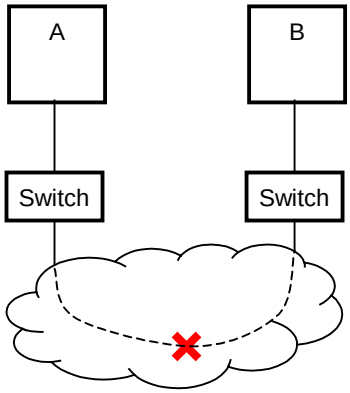
Use Case 10. Network goes down to primary server.



At fault:
- A remains primary.
- B goes from standby to primary.
- Clients reconnect with B.

At fault correction.
- Replication is stopped (because A and B are simultaneously running as primary).
- The sysadmin needs to select one of the servers as primary (probably B), and reconfigured the other for replication and standby..

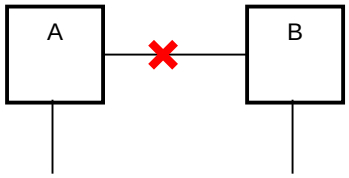
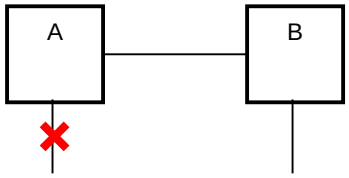
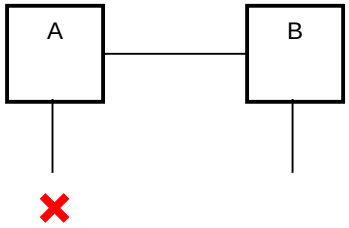
Conclusion:
- Service is not interrupted.
- Requires reconfiguration to restore standby service.

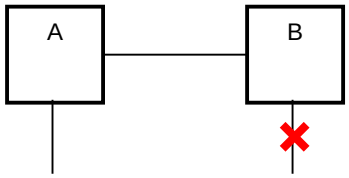
Use Case 11. Network goes down to standby server. 	At fault: - A remains primary. - B goes from standby to primary. - Clients remain connected to A. At fault correction. - Replication is stopped (because A and B are simultaneously running as primary). - The sysadmin needs to select one of the servers as primary (probably A), and reconfigured the other for replication and standby. Conclusion: - Service is not interrupted. - Requires reconfiguration to restore standby service.
Use Case 12. Network goes down between servers. 	At fault: - A remains primary. - B goes from standby to primary. - Clients that still have connectivity with A remain connected to A. - Clients that has lost connectivity with A tries to reconnect with B. At fault correction. - Client that lost connectivity with A reconnects with B. - Replication is stopped (because A and B are simultaneously running as primary). - The sysadmin needs to select one of the servers as primary, and reconfigured the other for replication. Conclusion: - Service is not interrupted. - Requires reconfiguration to restore standby service. - Because clients may have been connected to both servers simultaneously, then it may not be simple to select the "best" server as primary.

5 With direct connection between hosts, database via localhost

Note: Use Case 1 and Use Case 2 also applies to this setup.

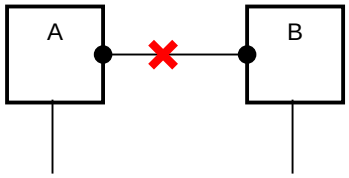
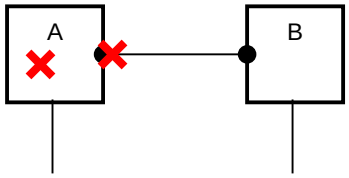
- Direct connection between hosts used for database replication.
- Servers are connected to their databases via localhost
- Hosts are connected to the rest of the network via other network.

Use Case 13. Connection goes down between hosts. 	At fault: - A remains primary. - B goes from standby to primary. At fault correction: - Replication is stopped (because A and B are simultaneously running as primary). - The sysadmin needs to reconfigure B for replication. Conclusion: - Service is not interrupted. - Requires reconfiguration to restore standby service. Note: - Similar to Use Case 12.
Use Case 14. Network goes down to primary host. 	At fault: - A remains primary. - Client tries and fails to connect to B. - Service is interrupted (unavailable). At fault correction: - A synchronizes state with monitored nodes. - User must manually reconnect client to A. Conclusion - **Service is interrupted** while the fault exists.
Use Case 15. Client loses network connection with primary server. 	At fault: - A remains primary. - Client tries to connect to other FE server, but there are none. - Service is interrupted for client. At fault correction: - Possible to manually reconnect client with primary server. Conclusion: - Does not affect servers. - Service is interrupted for the specific client.

Use Case 16. Network goes down to stanby host.  	At fault: - A remains primary. - Standby service is unavailable, but is still running. - B will go from standby to primary if B looses connectivity with A, in which case it is still unavailable. At fault correction: - Standby service is restored. - Conclusion: - Service is not interrupted.

6 With direct connection between hosts, database via external IP

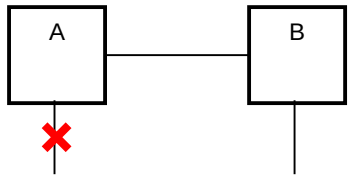
- Direct connection between hosts used for database replication.
- Servers are connected to their databases via the external IP address on the direct link.
- Hosts are connected to the rest of the network via a single Ethernet switch.
- **This is not a feasible solution!**

Use Case 17. Connection goes down between hosts. 	At fault: - A goes down. - B goes down. At fault correction: - A and B remains down and needs manual start. Conclusion: - **Service is interrupted.** - Requires manual start of A (or B) to restore primary service. - Requires manual start of B (or A) to restore standby service.
Use Case 18. Primary host goes down. 	At fault (host goes down): - B goes down because it looses connection with the database. (When A goes down, then the link also goes down to B.) At fault correction: - A and B remains down and needs manual start. Conclusion: - **Service is interrupted.** - Requires manual start of A (or B) to restore primary service. - Requires manual start of B (or A) to restore standby service.

7 With direct connection between hosts, database via localhosts, dual FE

- Direct connection between hosts used for database replication.
- Servers are connected to their databases via localhost.
- Primary and standby BE servers running in own JVM (not using default BE/FE-combo).
- FE servers on A and B running in own JVMs, both connected to primary BE. This means that clients can connect to any server.

Use Case 19. Network goes down to primary host.



At fault:
- A remains primary.
- Client reconnects to FE in B.

At fault correction:
- Client remains connected to FE in B.

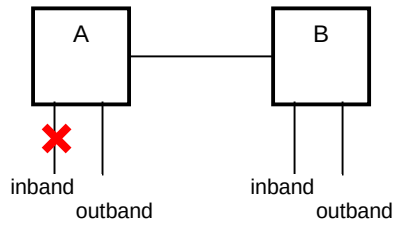
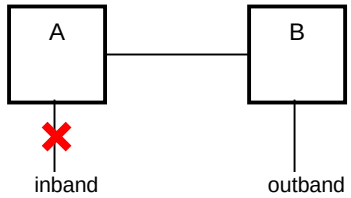
Conclusion:
- **Service is interrupted** while fault exists.
- Does not affect servers.

Note:
- Compare with Use Case 14 and Use Case 15.
- A does not have access to the nodes.

8 With direct connection between hosts, database via localhosts, dual FE, dual node networks

Note: Use Case 1 and Use Case 2 also applies to this setup.

- Direct connection between hosts used for database replication.
- Servers are connected to their databases via localhost.
- Primary and standby BE servers running in own JVM (not using default BE/FE-combo).
- FE servers on A and B running in own JVMs, both connected to primary BE. This means that clients can connect to any server.
- Using two redundant networks between the servers and the nodes (e.g. inband and outband networks).
- Alternative setup is to route to redundant network via peer host. This saves one interface, but requires the peer host to be up to access the redundant network. The alternative setup is often not feasible because some nodes are connected to only one network.

Use Case 20. Primary network goes down to primary (or both) host. 	At fault: - A remains primary. - A uses outband network to nodes. - Client reconnects to FE in B. At fault correction: - Client remains connected to FE in B. - A resumes to use preferred network to nodes (in- or outband network) Conclusion: - Service is not interrupted. - Does not affect servers. Note: - Compare with Use Case 14 and Use Case 15.
Use Case 21. Network goes down to primary host (alternative setup) 	At fault: - A remains primary. - A uses outband network routed via B to nodes. - Client reconnects to FE in B. At fault correction: - Client remains connected to FE in B. - A resumes to use preferred network to nodes (in- or outband) Conclusion: - Service is not interrupted. - Does not affect servers. Note: - Note difference with Use Case 14 and Use Case 15. - Note similarity with Use Case 20.