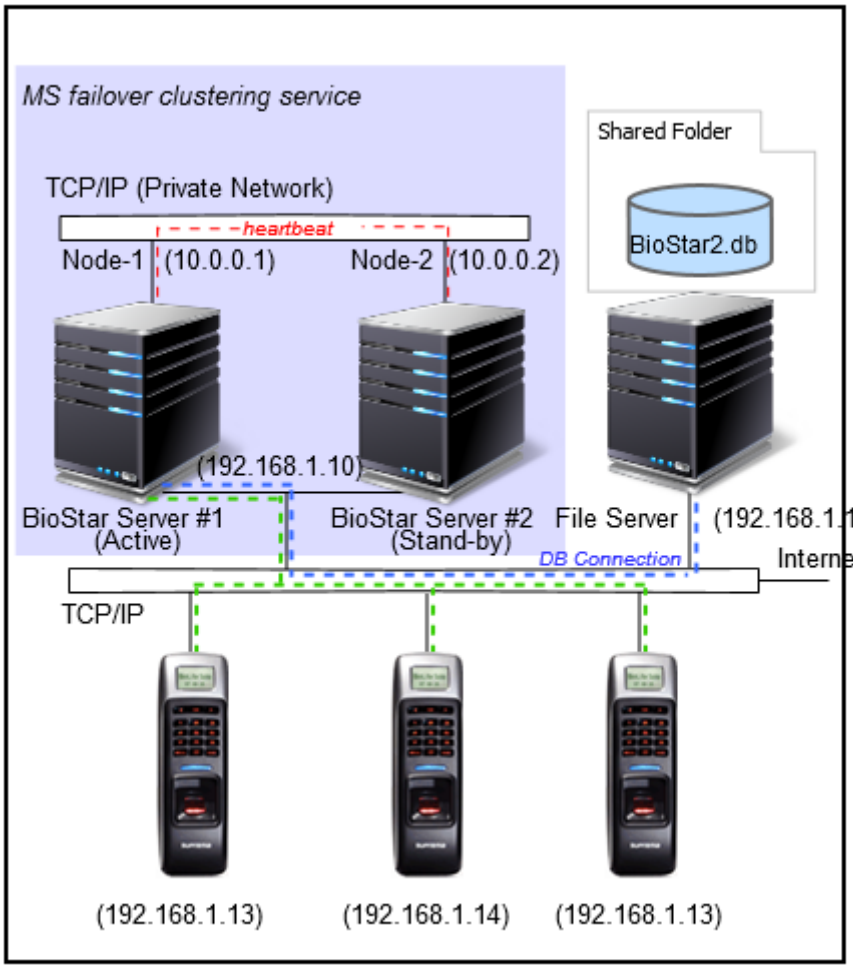
Failover System

for BioStar 2

1. Case 0 - Failover system configuration within Intranet



A. Characteristics
   i. Can be configured within LAN
   ii. Can share Data file (biostar2.db) between BioStar Server #1 and #2
   iii. If necessary, RAID 1,5,6 can be configured on File Server (*Optional*)

B. Failover Scenario
   i. biostar2.db is copied regularly (once a day) between On-site and DR-site
   ii. Set both of BioStar Server IP and Domain Address in BLN device.
   iii. Let the Server IP will have a higher priority than a domain BLN and have BLN connected.
   iv. When BioStar Server#1 becomes 'fail status', BioStar Server #2 will now become active and the its IP address will be set to be 192.168.1.10
   v. BLN checks 'Keep-alive status' between the BioStar Servers and when a timeout occurs, it will try to reconnect then it will be connected to BioStar Server#2.

C. Requirements
   i. Microsoft failover clustering service Settings
   ii. Scheduled Task Settings

iii. Device Connection mode must be 'Device To Server Mode' (equivalent to Server Mode in BioStar 1.x)

D. Advantages

i. When configuring RAID using File Server, you can prevent the Server stop for maintenance. (getting rid of planned downtime)

ii. No Customization is needed.

E. Disadvantages

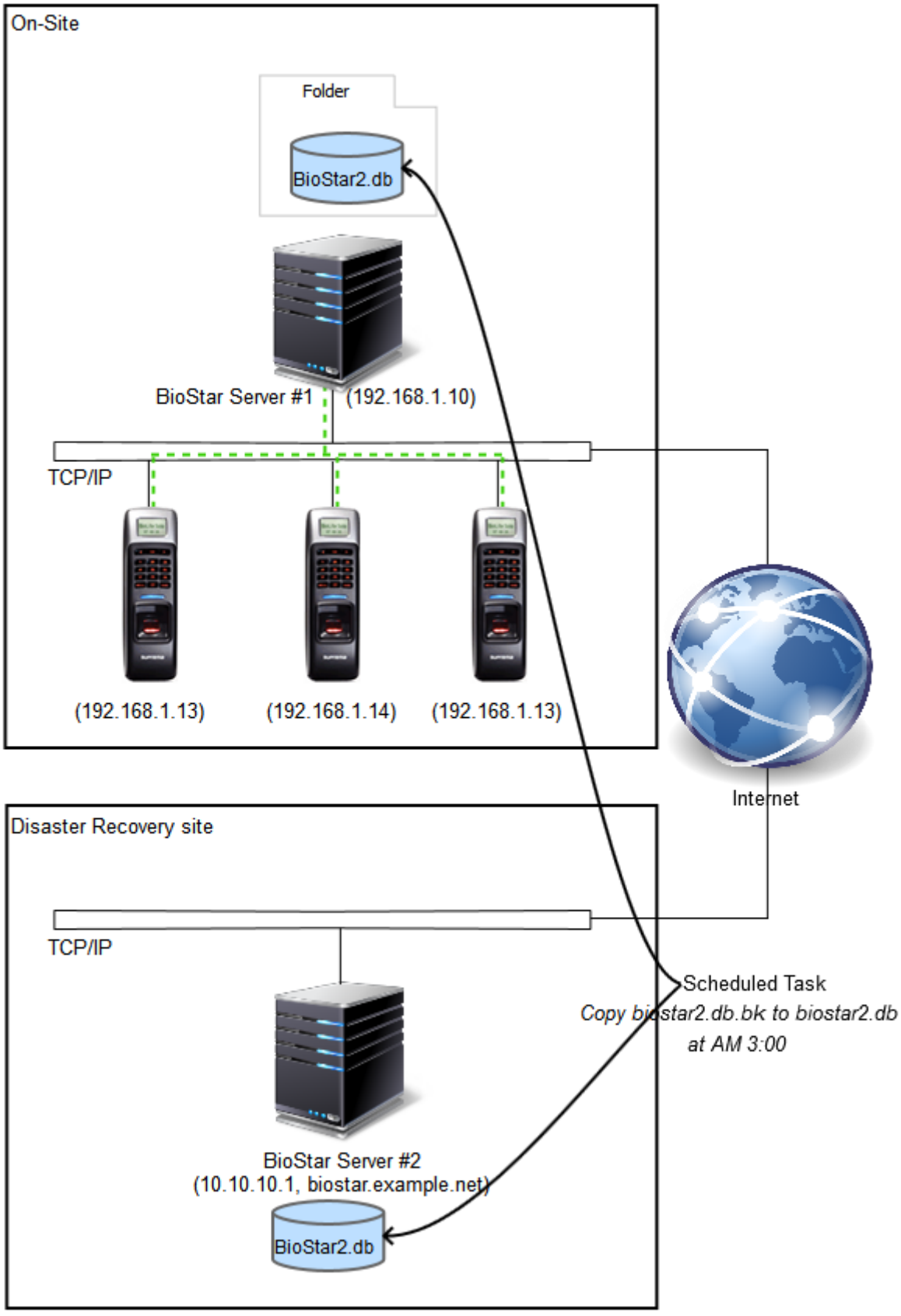
i. WAN environment is not considered.

ii. Cannot use Global Zone & Server Matching services until reconnected to the Server.

F. Reference

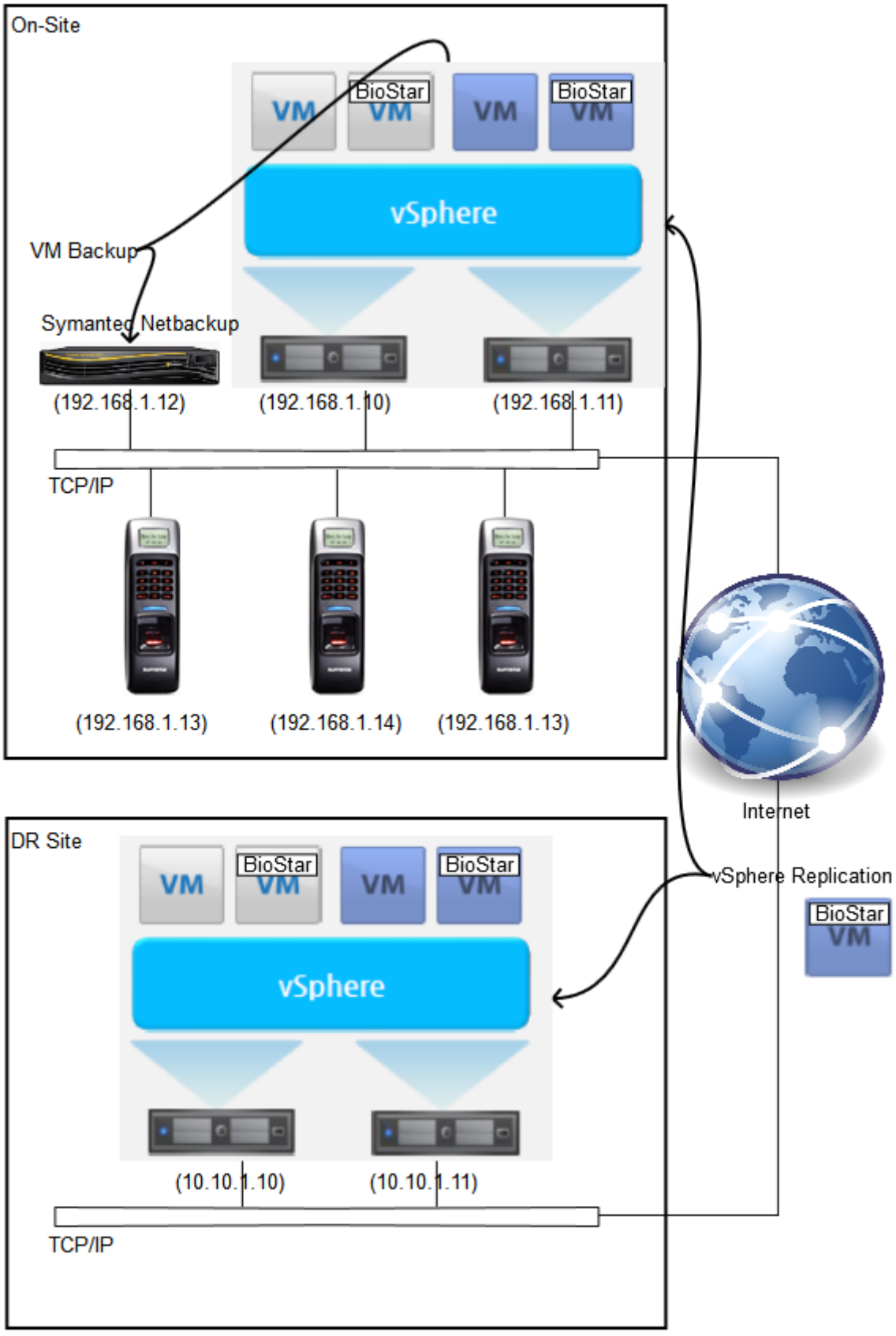
i. MS Windows Clustering Service - link#1, link#2

2. Case 1 – Failover system configuration between two remote Sites. (WAN environment)



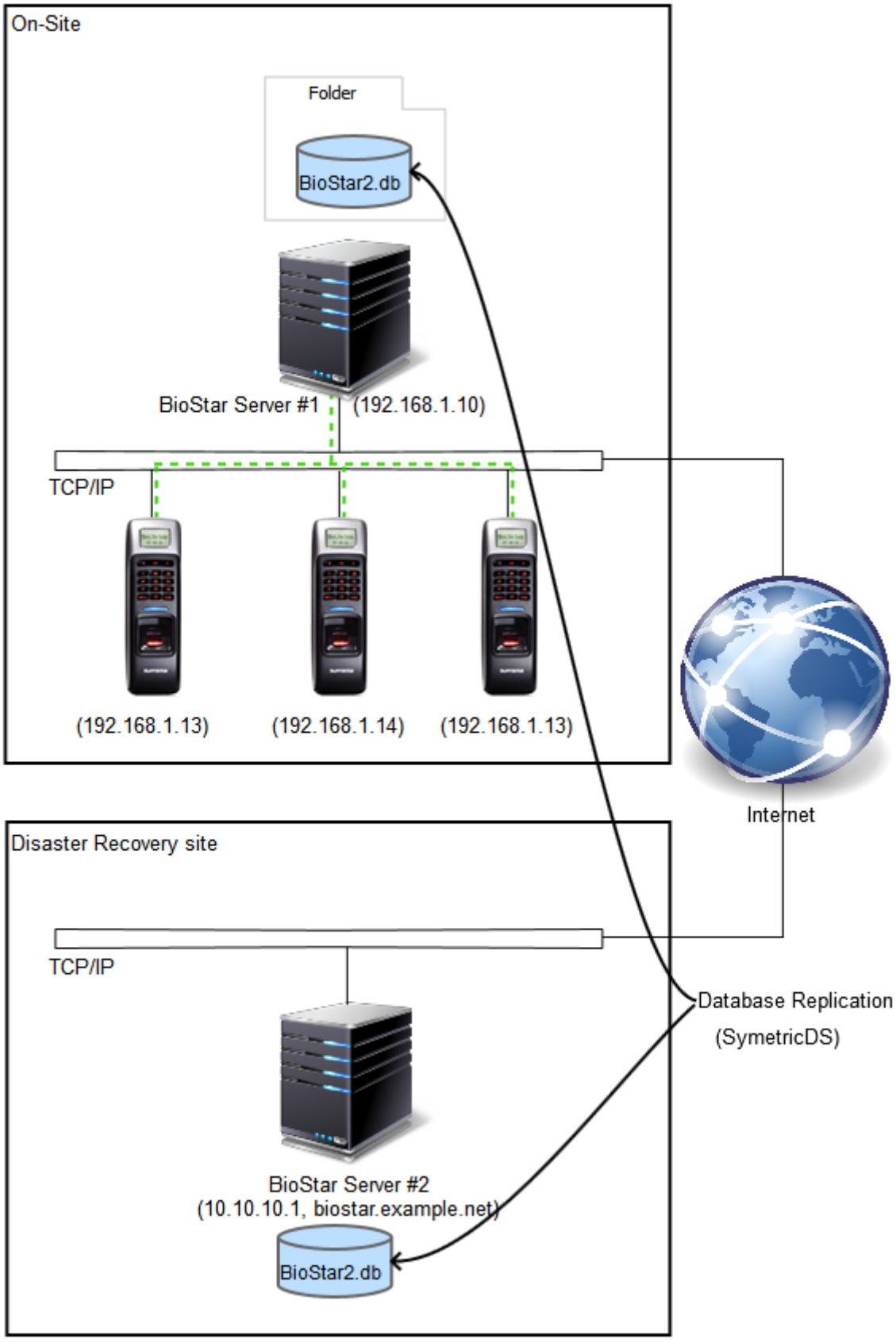
A. Characteristics
   i. Connects On-Site and Disaster Recovery Site(DR site) using Domain Address under WAN environment
   ii. Can copy Data file between On-Site and DR site
B. Failover Scenario
   i. biostar2.db is copied regularly (once a day) between On-site and DR-site
   ii. Set both of BioStar Server IP and Domain Address in BLN device.
   iii. Let the Server IP will have a higher priority than a domain BLN and have BLN connected.
   iv. BLN checks 'Keep-alive status' between the BioStar Servers and when a timeout occurs, it will try to reconnect then it will be connected to BioStar Server#2 using the Domain address.
C. Requirements
   i. Device Connection mode must be 'Device To Server Mode' (equivalent to Server Mode in BioStar 1.x)
   ii. BioStar Server #2 in DR Site either should be connected via Domain address or have a public IP
D. Customization required
   i. BLN
      1. Add a feature to have multiple BioStar Server IPs.
      2. Add a feature to set a priority between different BioStar Server IPs
      3. Add a feature to check and modify the connected BioStar Server IP.
   ii. BioStar
      1. Modify UI to set a Server IP in the Device Setting
E. Expected Resource/Period needed
   i. Resource – 1 BioStar S/W engineer, 1 F/W engineer
   ii. Period – 3 weeks(2 weeks for development, 1 week for testing)
F. Advantages
   i. Can be configured quickly
G. Disadvantages
   i. Customization is required
   ii. Real-time replication of db file is not supported. (thru regular copying process)
   iii. Cannot use Global Zone & Server Matching services until reconnected to the Server.

3. Case 2 - High Availability (ex. VMware HA, Symantec NetBackup)



A. Characteristics
   i. Uses Server Virtualization and Dualization.
   ii. Virtual Machine itself is replicated between On site and DR site
B. Failover Scenario
   i. VM is synchronized(real-time) between On-site and DR-site
   ii. Set both of BioStar Server IP and Domain Address in BLN device.
   iii. Let the Server IP will have a higher priority than a domain BLN and have BLN connected.
   iv. BLN checks 'Keep-alive status' between the BioStar Servers and when a timeout occurs, it will try to reconnect then it will be connected to BioStar Server#2 using the Domain address.
C. Requirements
   i. Device Connection mode must be 'Device To Server Mode' (equivalent to Server Mode in BioStar 1.x)
   ii. BioStar Server #2 in DR Site either should be connected via Domain address or have a public IP
D. Customization required
   i. BLN
      1. Add a feature to have multiple BioStar Server IPs.
      2. Add a feature to set a priority between different BioStar Server IPs
      3. Add a feature to check and modify the connected BioStar Server IP.
   ii. BioStar
      1. Modify UI to set a Server IP in the Device Setting
E. Advantages
   i. Can be configured quickly
   ii. VM is replicated (real-time) between On site and DR site
F. Disadvantages
   i. Additional expense is expected to introduce the Solution
   ii. Cannot use Global Zone & Server Matching services until reconnected to the Server.
G. Expected Resource/Period needed
   i. Resource – 1 BioStar S/W engineer, 1 F/W engineer
   ii. Period – 3 weeks(2 weeks for development, 1 week for testing)
H. Reference
   i. VMware : vSphere , vSphere Replication FAQ
   ii. Symantec : NetBackup

4. Case 3 - Database Replication (ex. SymetricDS)



A. Characteristics
   i. Can connect On-Site and DR-Site using Domain Address under WAN environment
   ii. Real-time synchronization of On-site and DR-site
B. Failover Scenario
   i. biostar2.db is synchronizaed(real-time) between On-Site and DR-site
   ii. Set both of BioStar Server IP and Domain Address in BLN device.
   iii. Let the Server IP will have a higher priority than a domain BLN and have BLN connected.
   iv. BLN checks 'Keep-alive status' between the BioStar Servers and when a timeout occurs, it will try to reconnect then it will be connected to BioStar Server#2 using the Domain address.
C. Requirements
   i. Device Connection mode must be 'Device To Server Mode' (equivalent to Server Mode in BioStar 1.x)
   ii. BioStar Server #2 in DR Site either should be connected via Domain address or have a public IP
D. Customization required
   i. BLN
      1. Add a feature to have multiple BioStar Server IPs.
      2. Add a feature to set a priority between different BioStar Server IPs
      3. Add a feature to check and modify the connected BioStar Server IP.
   ii. BioStar
      1. Modify UI to set a Server IP in the Device Setting
      2. SymetricDS is applied to DB
E. Expected Resource/Period needed
   i. Resource – 1 BioStar S/W engineer, 1 F/W engineer
   ii. Period – 3 weeks(2 weeks for development, 1 week for testing)
F. Advantages
   i. Can be configured quickly
   ii. Real-time DB info replication
G. Disadvantages
   i. Customization is required
   ii. Cannot use Global Zone & Server Matching services until reconnected to the Server.