

Nokia VitalQIP High Availability Solution

Enterprise Appliance High Availability and Disaster Recovery

Nokia VitalQIP® DNS/DHCP and IP Address Management (IPAM) software provides High Availability or Disaster Recovery for Enterprise and Service Provider environments ensuring that your mission-critical IPAM infrastructure remains operational despite network, hardware or service outages. During normal operations, the VitalQIP Enterprise services and database are synchronized across a pair of VitalQIP Enterprise Appliances. These Appliances can be located in the same data center or across the globe. If an outage occurs, the Enterprise services are started on the warm standby Appliance with absolutely zero data loss. The DNS/DHCP servers remain operational throughout the failover process and retain connectivity with the Enterprise Appliance that is currently in the active state.

The VitalQIP Enterprise Appliance High Availability and Disaster Recovery solution requires a pair of VitalQIP Enterprise Server Module (ESM) appliances. This feature is available in two options:

- High Availability (ESM-HA) – The Appliances are located on the same subnet in the same data center or in data centers located in close proximity to one another.
- Disaster Recovery (ESM-DR) – The Appliances do not need to be on the same subnet and can be located in separate cities, across the country or on the other side of the earth.

High Availability (HA) Option

The VitalQIP Enterprise Appliance High Availability solution offers resiliency for VitalQIP IPAM installations – resiliency that has only been available by using expensive and error-prone third-party solutions. Complete High Availability support is now available from a single vendor: Nokia.



As shown in Figure 1 below, a pair of Nokia VitalQIP Appliances is configured as a Primary (Active) and a Secondary (Standby) server. The VitalQIP administrators will use the VitalQIP GUI to access the VitalQIP Enterprise application and maintain IPAM data. The Virtual IP (VIP) address allows the users to access the active machine (indicated by solid arrows). The Remote servers running DNS, DHCP and other mission critical services are connected to the Primary Appliance.

Automatic Data Synchronization between Enterprise Appliances

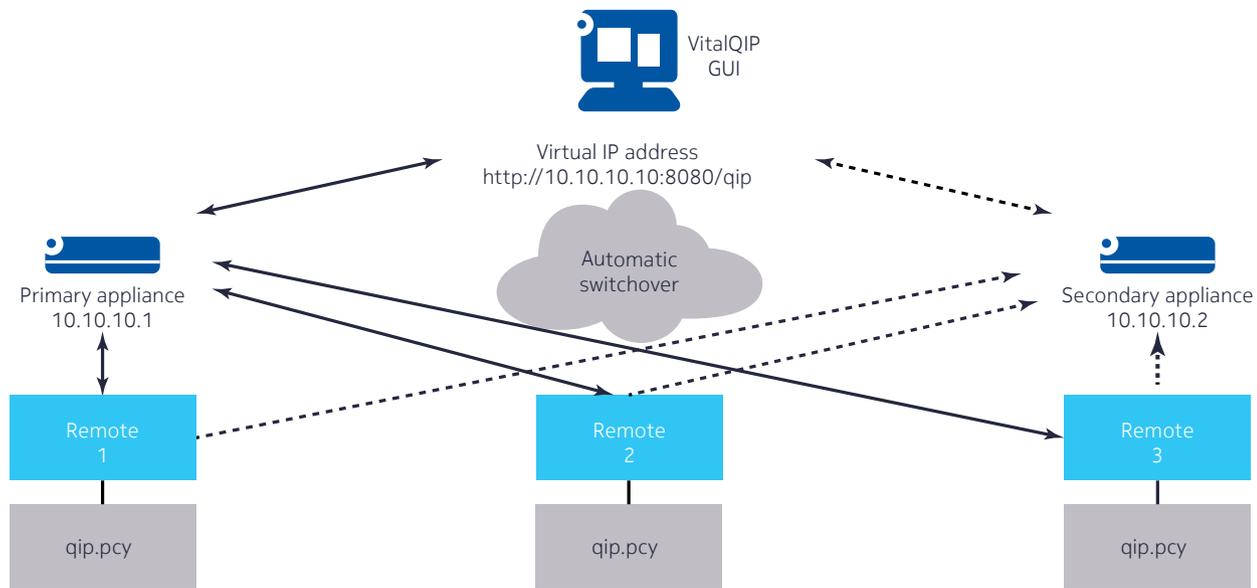
The High Availability solution includes Sybase Replication Server which ensures that the databases on the Primary and Secondary servers are consistent and in “lock step.” Changes to

the database on the Active server get replicated automatically and in near-real time to the Standby server. If one server is down, the changes are queued in a transaction log until the server comes back on-line.

Automatic Failover

In the event of a failure to the Active Appliance, to the network or to the services running on the Active Appliance, an automatic failover (or switchover) will occur. In this situation, assurances are made so that the VitalQIP Enterprise services on the Active Appliance are stopped. Then, the VitalQIP Enterprise services on the Standby Appliance are quickly started. The DNS/DHCP services and the VitalQIP database continue to run during this operation.

Figure 1. VitalQIP Enterprise Server - HA



During the automatic failover, the users continue to use the VIP address to access the VitalQIP GUI. Despite a momentary delay when the failover is occurring, minimal disruption will be experienced, and no data will be lost during the failover.

DNS/DHCP remotes automatically reconnect after failover

Once failover has completed, the remote servers running DNS, DHCP and other applications (such as NTP, TFTP, SNMP, Anycast, DNS High Availability, DNS/DHCP probes, etc.) will automatically reconnect to the new Active Appliance. Any updates to the Enterprise database will be queued on the remote server until the connection can be reestablished.

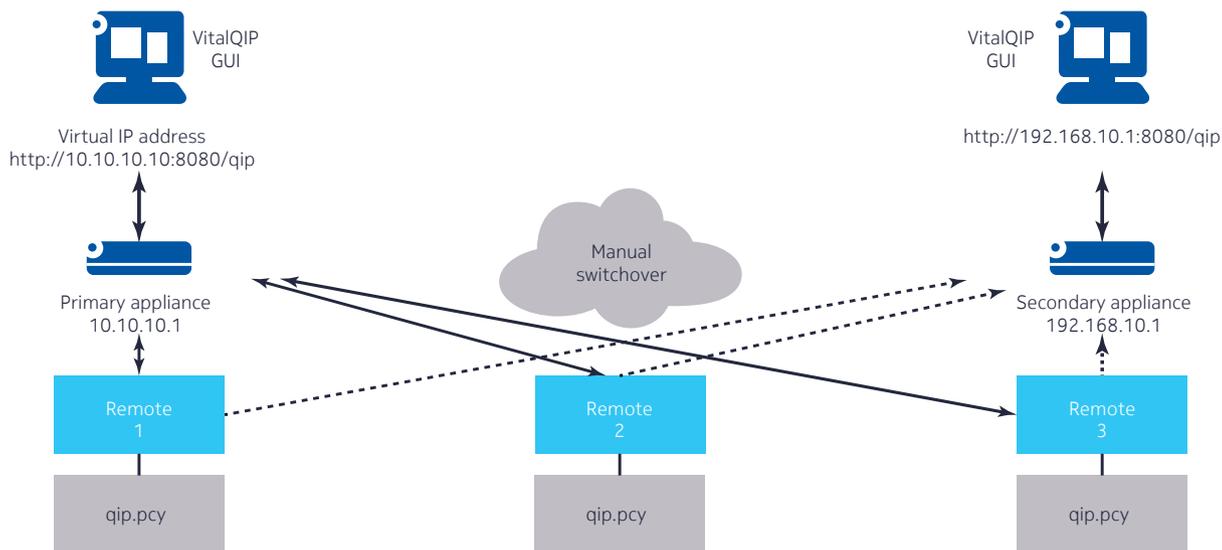
Manual Failover

Users can also initiate manual failover to shift services from the Active to the Standby Appliance. The same synchronization occurs as in the automatic failover. The manual failover can be performed for routine maintenance or to test disaster recovery readiness.

Table 1: Features and benefits

Features	Benefits
Automated data synchronization between pair of Enterprise Appliances	In the event of outage, data integrity is maintained and no operational data is lost.
DNS/DHCP servers remain connected to active Enterprise Appliance	Continuous availability of essential DNS and DHCP services for client devices.
Management of High Availability and Disaster Recovery options are facilitated by Appliance Management Software (AMS)	Intuitive setup using the same interface administrators use to setup VitalQIP Appliances, which reduces the learning curve.
Comprehensive GUI for administration and troubleshooting	Simplifies administration and reduces costs related to expensive outages.

Figure 2. VitalQIP Enterprise Server - DR



Disaster Recovery (DR) Option

The Disaster Recovery (DR) option is similar to the High Availability (HA) option except that failover is manually initiated. An added benefit of the DR option is that the Enterprise Appliances do not need to be on the same subnet and can be in data centers located anywhere in the world. Users will have multiple links to the VitalQIP GUIs. Network solutions can be utilized to create a single link if desired.

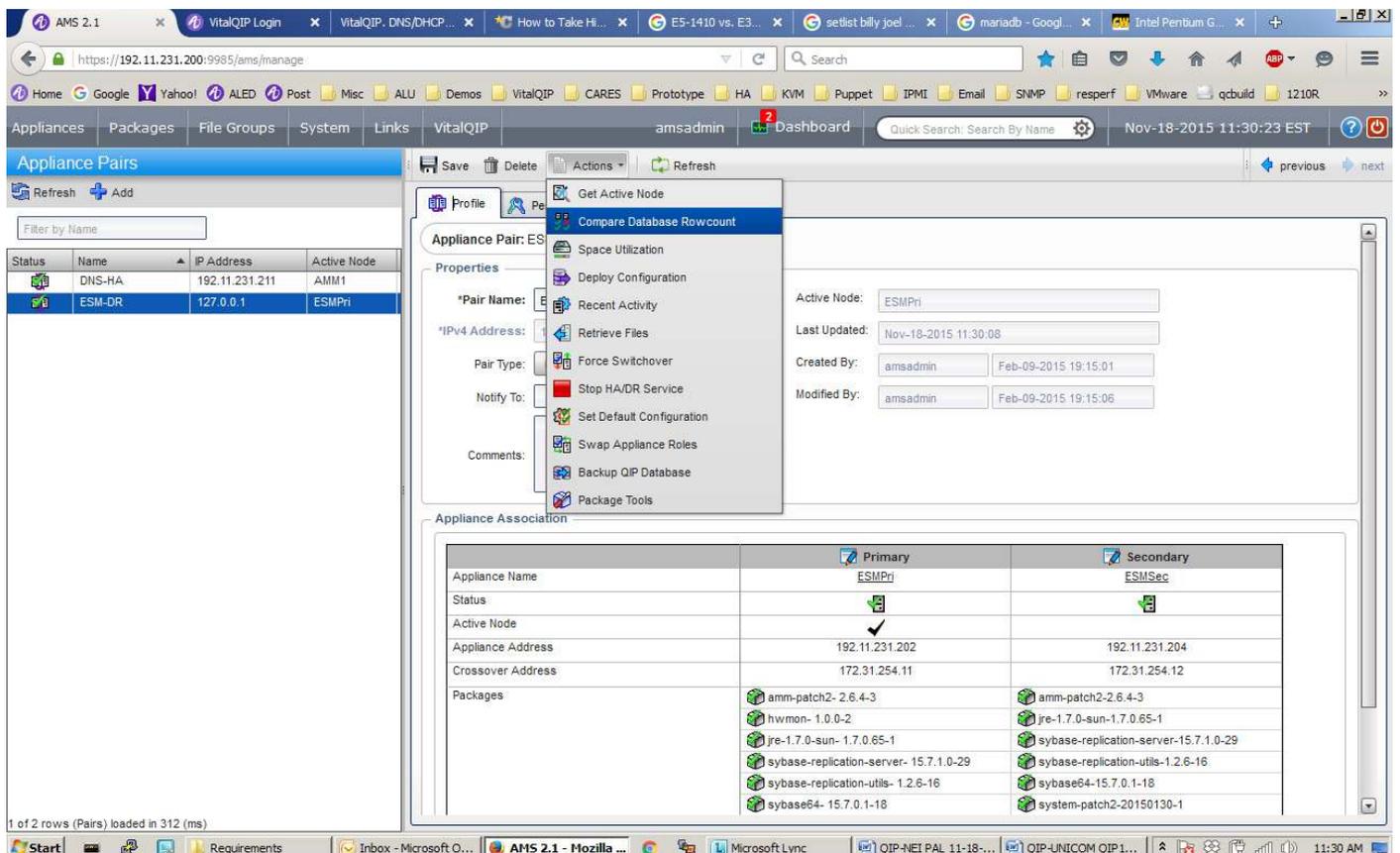
Configuration, Monitoring and Troubleshooting

The High Availability and Disaster Recovery solutions are configured using the Appliance Management Software (AMS). The AMS screen (figure 3) below is used to define the pair, select whether High

Availability or Disaster Recovery is preferred, and choose the two appliances that comprise the pair. Once the appropriate services are configured and deployed, the same screen is used to monitor the status of the services and troubleshoot any problems that may occur.

The screen indicates which Appliance is the “Active” appliance. Useful color-coded icons allow quick identification of any problems with the associated services. There are a number of Actions that are available to assist the administrator to manage the services and perform any necessary troubleshooting. For example, if the administrator would like to perform maintenance on the Primary appliance, he or she can initiate a “fail over” to the Secondary appliance by clicking on the “Force

Figure 3. Configuration, troubleshooting and monitoring



Switchover” action. Another useful action is “Compare Database Rowcount” which provides the current count of the respective IPv4 and IPv6 objects in the database for quick comparison. If an unexplained problem occurs and help is needed, log files can be pulled from either machine and sent to Nokia Support for analysis. The Services can be stopped and started, and space utilization can be viewed. These tools will help keep your VitalQIP environment running non-stop and minimize administrative costs.

Features

- VitalQIP data synchronization and recovery
- High Availability and Disaster Recovery Options
- No loss of data/transactions
- Single point of contact (Nokia) in case of problems

- Monitoring and Troubleshooting with AMS GUI
- Sybase Replication Server for high performance, scalability, security and guaranteed data delivery in near-real time

Platform support

- Recommended VitalQIP Hardware Appliances: QIP-1210RAID, QIP-6010
- Software/Virtual Appliances also available (Contact Nokia)

Software requirements

- VitalQIP 8.0 or higher
- VitalQIP Appliance Manager (included with VitalQIP Appliances)
- Sybase Replication Server (provided with ESM-HA/DR feature)

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