VMware Architecture Proposal

Introduction

A strategic decision has been made to implement a VMware ESX infrastructure within the organisation. Initially two separate ESX infrastructures will be required as currently the organisation's networks are physically isolated. Once logistical issues have been resolved it is planned to co-locate the two networks within one data centre allowing the consolidation of the management and storage infrastructure. It has yet to be decided if it will be possible to integrate the two production networks as they currently serve two independent administrative units.

This document presents the initial deployment proposal which features two entirely separate ESX Infrastructures followed by the combined deployment with a single management network and storage infrastructure. For the purposes of this document the two networks shall be referred to as Net_A and Net_B.

The ESX deployment on Net_A will initially cater for a community of 70 – 100 users; however, once future applications are migrated onto the ESX infrastructure, the user community is expected to grow to over 500 users. Accommodations have been made to ensure that additional ESX hosts can be added to the infrastructure when required.

The ESX deployment on Net_B caters for a smaller community of 20-25 users which is unlikely to grow significantly and therefore the deployment has lower scalability and performance requirements; however it is intended to standardise the ESX hosts and interconnections in both deployments to facilitate simpler integration at a later date, the only significant architectural difference between the Net_A and Net_B deployments is the "class" of SAN that been selected in each instance.

Due to the cost implications and lack of knowledge of Fibre channel infrastructure, a decision has been made to standardise on iSCSI based storage. Selecting a single storage infrastructure technology will also ensure we are able to integrate the multiple SANs once the networks have been co-located. The expectation is that both SAN devices will feature in the combined deployment with the lower specification SAN being used for second tier storage or lower priority/performance applications.

Technical Specification

ESX Hosts

One standard Specification has been identified for the ESX hosts which will be provisioned into both networks, where possible future machines provisioned into the networks will also follow the configuration.

Dell Power Edge R805

2x Quad Core Opteron 2352 (2.1GHz, 2MB)
8GB (4x2GB Dual Rank DIMMs) 667MHz
2x 73GB SAS 10k 2.5" HD (configured with RAID 1)
DRAC5 Remote Management Card
Redundant 700 watt hot-plug power supplies
Four embedded Broadcom NetXtreme II 5708 GigE NICs
Intel® PRO 1000VT Quad Port GigE NIC

NICs from multiple vendors have been selected (as per VMware best practice), where NIC teaming is used ports from both cards will be used within the team.

VMware ESXi 3.5 Enterprise has been selected and will be installed onto a SD card or USB stick inside the servers.
Initially Software initiated iSCSI will be used however, security or performance reasons may dictate the use of iSCSI HBAs

Virtual Center server

Virtual Center will be deployed onto a physical server; initially each Deployment will have one Virtual Center server. Once the two management networks are merged the redundant Virtual Center will be installed as a hot standby.

Dell Power Edge SC1435

1x Quad Core Opteron 2352 (2.1GHz, 2MB)
2GB (2x1GB Dual Rank DIMMs) 667MHz
2x 73GB SAS 15k 3.5" HD (with Raid 1)
DRAC5 Remote Management Card
Dual Embedded GigE NICs

As two Virtual Center servers will be required to complete the initial deployment it is envisaged that once the second stage has been conducted and the two management networks have been integrated the redundant Virtual Center server and associated licence will be re-purposed onto the Business continuity network.

SANs

Both SANs have been selected from the DELL Equallogic PS5000 series. The SANs will be configured with redundant dual iSCSI storage controllers, offering 3 GigE Network connectivity. The SAN on NET_B will be the entry level PS5000E, provisioned with 16 250GB/7,200 RPM SATA drives giving a raw storage capacity of 4TB. The SAN on NET_A will be the higher speed and Capacity PS5000X, which contains 16 400GB/10,000 RPM SAS drives providing a raw storage capacity of 6.4TB. Once the second stage has been conducted and the storage networks have been integrated both SANs will be grouped into a load balanced storage pool.

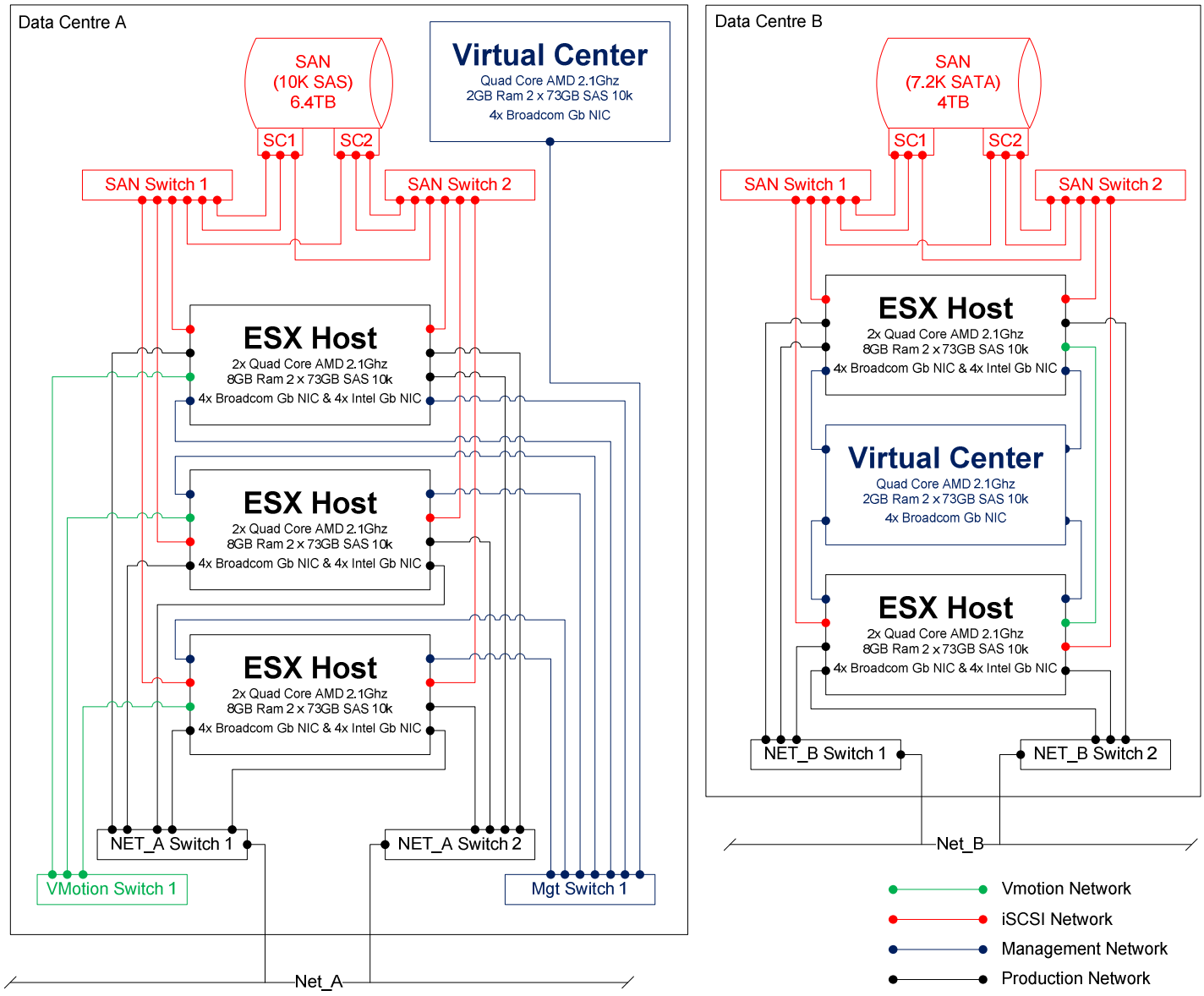
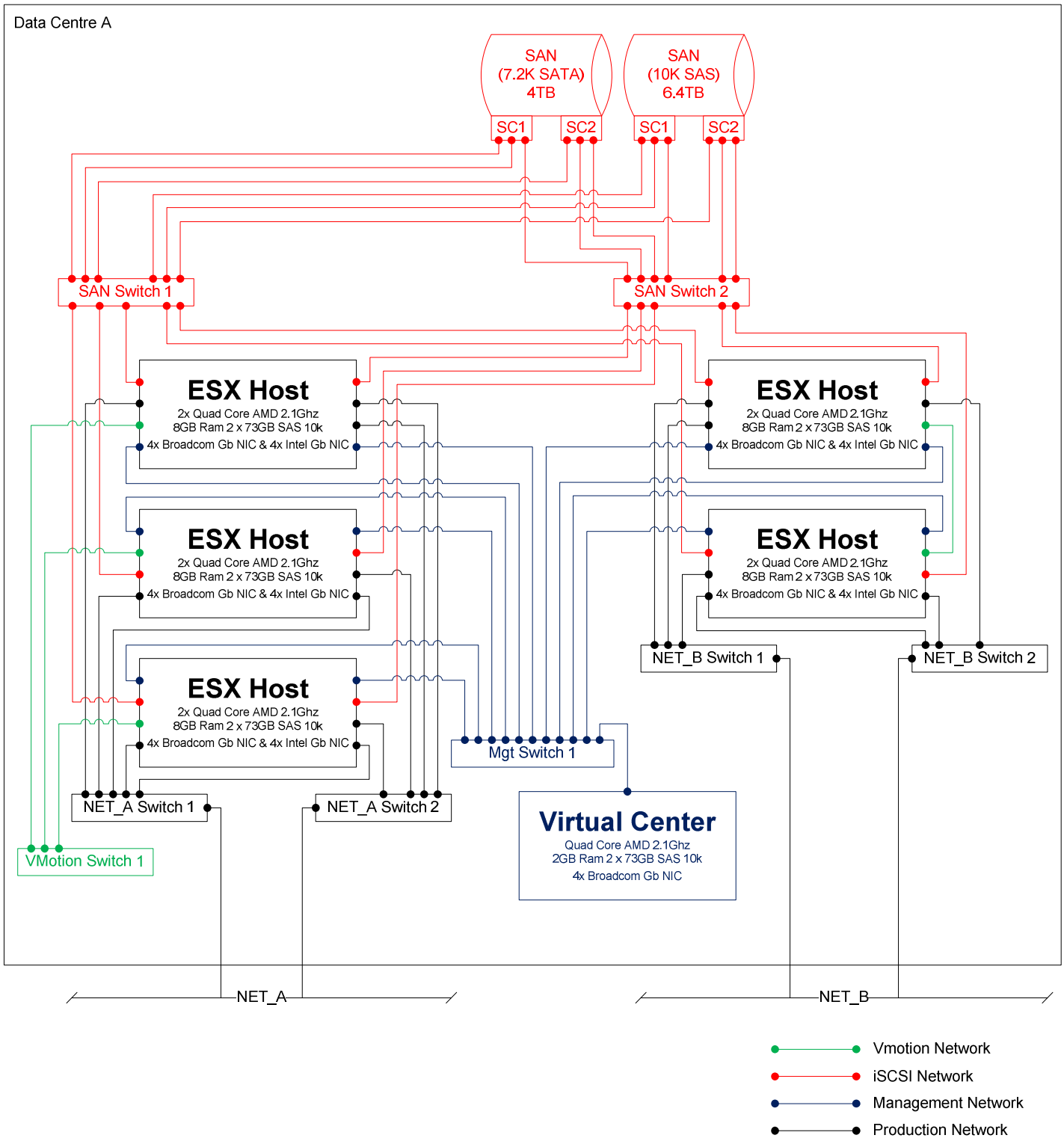
Backup and DR

Initially agent based backup solutions will be used to backup the Virtual machines state, however it is planned to investigate the use of VMware Consolidate Backup (VCB) to remove the need to have agents installed into the Virtual Machines.

Business Continuity

During the first two stages of the deployment no attempt has been made to provide a Business continuity solution however it is envisaged that once the networks are integrated with a single storage fabric a SAN replication could be used along with some additional hardware and the spare Virtual Center server to provide a business continuity service.

Initial "Split" Deployment



Combined Deployment