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# 1. LAN-SAN ArchitectureSET OF SERVICE PROCESSORS INTERNAL Bladesystem TRUNK CONNECTIONS FROM HOSTS TO GigE SWITCHES BLADE SERVERS STORAGE AREA NETWORK LOGICAL UNITS created through abstraction of mass storage via IT services AS TRUNK to TOR SWITCH, carries public VLANs IP NETWORKING BETWEEN HOSTS AND TO LAN CLIENTS OGICAL NETWORKS IMPLEMENTED IN GigE SWITCHES APE BladeSystern c7000 STORAGE CLIENTS — blade servers interface to storage are network LOGICAL NETWORK IMPLEMENTED IN FC SWITCHES STORAGE SYSTEM: HPE EVA4400

# 2. Skill set prerequisite

The architecture diagram shows the major systems in a LAN + SAN architecture that \*\*\*may\*\*\* serve as the infrastructural foundation for the Cloudlet.

## System #1: HPE BladeSystem c7000

The c7000 incorporates device bays, interconnect bays, power supply, cooling, a midplane for managing connectivity between device bays and interconnect bays and a service processor which is referred to as the "Onboard Administrator" (OA).

Most of the learning involved here is with connectivity management. The c7000 uses a midplane that provides copper trace connections between:

* adapters that are housed inside the blade servers and
* the switches that are housed at the rear of the system in the interconnect bays

There is lots of good documentation about the internal organisation of the c7000. I have a number of resources which I can point to in order to beat a path through the documentation jungle surrounding the c7000 !

The process exposes the installer to extensive interaction with service processors. These management modules are included with server-grade hardware as a means of providing remote, headless operation of the server. Familiarity with the operation of service processors is useful. This includes knowledge of the tasks that can be carried out using such a device, such as power control, remote installation and diagnostics.

In order to start interacting with the c7000, a "management" laptop and a connection to the OA is required. To carry out this task, basic knowledge of IPv4 network addresses is required.

Once connected to the OA, a journey of navigation through the web interface begins. The blades in the device bays, the switches in the interconnect bays are all open to navigation from this first point of arrival.

## System #2: HPE EVA4400 storage system

This system is a computer dedicated to the purpose of abstracting the mass storage devices into fault-tolerant, high-performance logical units. There are three broad technology classes that are involved in the operation of the EVA 4400: the SCSI Architectural Model, Fibre Channel and RAID.

The SCSI architectural model includes storage servers (targets), storage clients (initiators), logical units, interconnects and access control. These concepts are useful for handling a storage area network. Practical interconnects are supported by system software to provide redundancy through support for logical multipathing: a technique whereby multiple physical paths are aggregated into a single logical path.

Fibre Channel (FC) technology includes concepts of FC switches, client identification through world-wide node names (WWNN), division of a network into zones and optic fibre and copper cable types.

RAID technology includes RAID categories, with each category having fault-tolerance, redundancy and performance characteristics. At a minimum, knowledge of the fault tolerance and redundancy is required before choosing a category for implementation. It is also useful to have knowledge of the performance of a RAID category and the applications to which it is best matched.

## System #3: Local area network

The LAN switches in the BladeSystem connect to the blade servers through internal ports on the midplane. Each such port will most likely need to be configured as an 802.1Q trunk as it would most likely carry frames from several VLANs.

The switches also connect the BladeSystem to the server room's network. The latter is represented in the hardware set by a top-of-rack (ToR) switch. The ToR switch provides connectivity to external systems, including to users coming in from the Internet. Familiarity with the concepts of VLANs is important to successfully separate VM traffic.