Using iSCSI Boot for Server Flexibility

Building a Flexible ATCA Architecture with iSCSI Boot

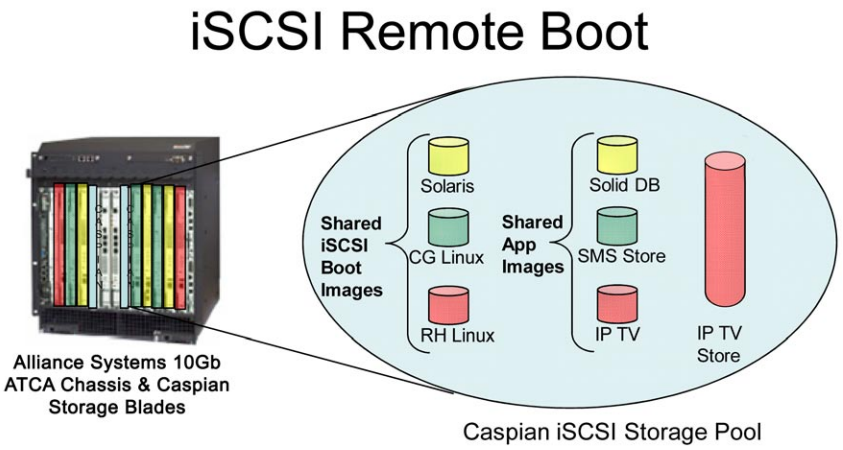
Astute Networks' Caspian R1100 Edge Storage Blade, is enabling NEPs and Telcos to build truly stateless ATCA servers with our iSCSI boot support for Carrier Grade implementations. The roles required of ATCA systems are more demanding with an increased variety of applications, operating systems and server processors running in a single chassis. The ability to rapidly deploy, manage, repurpose and upgrade systems for new or changing applications is a constant challenge for NEPs and Telcos. In this paper we review the advantages of creating a "stateless" server model using Astute Networks' iSCSI boot to meet these challenges.

The Stateless Server

The stateless server is a simple concept. On a stateless server there is no disk or flash drive to hold the "state" (OS, Applications, Data) of the server. Upon boot up the state of the server is loaded on the server from a centralized and/or remote source. This enables the server to be dynamically allocated without the need to re-build applications, Operating Systems or migrate data. Telcos and NEPs can benefit from building stateless servers to improve flexibility and reduce operating costs and management overhead.

Caspian R1100 Edge Storage Blade

Astute Networks' Caspian R1100 Edge Storage Blade is the first 10Gb iSCSI storage solution for ATCA. It is designed to provide iSCSI boot services for diskless and stateless server environments. The R1100's iSCSI boot support allows NEPs and Telcos to centralize their storage across all servers. They can now store a single set of OS boot images and applications files that can be shared over all servers in a chassis or across chassis. Centralizing the storage reduces management overhead, capital cost, power consumption and improves recovery time, server deployment time and systems availability compared to DAS.



5 Steps to iSCSI Boot

1. Create Boot & Application Images on the Caspian
2. Change boot source in BIOS from local to remote
3. Assign ATCA Blades to their boot images
4. iSCSI Boot Loads the OS image to the stateless server memory
5. Launch Application and run as normal

Key Benefits of iSCSI Boot and Stateless Servers

- **Diskless Servers** – Diskless servers supported by Caspian storage blades lower the cost and power consumption of ATCA blades. The Caspian R1100 use of 10Gb iSCSI enables high performance, highly available shared storage.
- **Centralize OS and Application Images** – iSCSI boot enables the use of centralized OS and application images. This makes management upgrades and control of servers faster and easier. Even in environments with multiple OS images, the centralized approach is less complex. The same is true for ATCA applications running on server blades.
- **Rapid Deployment and Re-Purposing of Servers** – One of the key benefits of stateless servers and iSCSI boot is rapid deployment and repurposing of servers. iSCSI boot provides a central boot image that allows servers to be added with no build up time. Simply point the new server toward the right boot and application LUNs and they are up and running. For existing servers changing OS or applications is also just as easy.
- **No Data Migration Required** – The centralized and shared storage of Caspian eliminates the need to migrate data after adding or re-purposing a new server. Simply re-map the LUN from the centralized SNMP console and the new server is ready to use existing data.
- **Less Cost/Subscriber** – It costs less to support subscribers with stateless servers and iSCSI boot. Combined with the increased 10Gb bandwidth of the Alliance ATCA chassis and Caspian storage blades, moving from DAS to external centralized storage blades increases the number of servers per rack and lowers the cost of storage. These savings and the ability to support more subscribers in the same footprint can reduce the cost per subscriber up to 50%.
- **Lower Carrier Acquisition Costs** – Moving from servers with DAS to diskless, stateless servers reduces acquisition costs up to 10%.
- **Reduces Management Overhead** – Stateless servers implementing iSCSI boot with the R1100 reduce management overhead. Centralizing storage reduces the number of OS instances and applications that need to be managed. Additionally, the R1100's storage model is centrally managed via SNMP unlike external FC storage.
- **Improved Availability and Field Service** – Centralizing storage on the Caspian R1100 shared storage blades allows NEPs and Telcos to reduce the number of disk drives in the chassis. This improves availability by reducing electromechanical devices in the field. Second, the use of centralized storage allows for rapid remote re-deployment to hot spares in the chassis without data migration. Finally, iSCSI boot can lower FRU and service costs. Since fewer HDDs can fail there will be fewer service calls to replace failed drives.

Capital Costs	Servers with DAS	State-Less Server with iSCSI Boot
Centralized OS and Application Images	No	**Yes**
Server Replacement without Data Migration	No	**Yes**
Quick Server Repurposing	No	**Yes**
Server Blade Reliability	Low	**High**
Total Storage Cost	Similiar	

The Caspian R1100 Edge Storage Blade is the first 10Gb iSCSI storage solution for ATCA. It is designed to provide high performance, high availability storage that lowers storage cost per server. Since the R1100 is an ATCA storage solution, it is designed to be easy to install, manage, support, configure and deploy.

Astute Networks is the leading provider of bladed storage solutions designed to handle the most demanding applications served to the edge of the network. Whether you are delivering Telco, military C4I applications or video surveillance, the Astute Networks' Edge Storage Architecture (ESA) provides a storage platform that builds-in high performance, high reliability, rack densities and deployment simplicities required to execute on the edge.

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