

Storage Area Networks

Data High Availability

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I. INTRODUCTION

What to do if a storm flooded an operational data center? Or what to do if a power outage blacked out all servers? How to recover data and keep a network running after an unforeseen disaster? When a disaster occurs, the consequences range from system downtime to complete mission failure. One of the points to focus on in any disaster recovery plan is data storage and high availability of this data.

II. STORAGE AREA NETWORKS

A Storage Area Network (SAN) is a high-speed sub network of shared storage devices. It physically splits the DATA from its servers using block level storage and centralizing all data on a specific location in order to make it available for everybody (end users) and everything (servers and backup). With a SAN, the concept of a single host computer that owns data or storage isn't meaningful. All of the servers are physically connected to all of the storage devices. If a server needs data that was produced by another server, there's no need to copy it. The requesting server can access the devices on which the providing server stored the data.

III. DATA HIGH AVAILABILITY

High availability is essential in data storage. Because data is centralized, in case of failure, everything is lost. Therefore the complete data must be equally spread yet equally available. The system and services must be designed in a way that ensures the operational requirements.

IV. IMPLEMENTATION IN EUROCORPS

The EUROCORPS SECRET (ECS) network consists of approximately forty servers (physical and virtual) spread over two sites. The ECS SAN is also spread over these two sites. The ECS SAN equipment consists out of identical physical devices. The total storage capacity is 15T approximately. ECS is a simple and one SAN text book example of "high availability".

V. IMPLEMENTATION IN BELGIAN DEFENSE

The Belgian Corporate Data Center (CDC) and the Belgian Corporate Data Network (CDN) consist of approximately 400 servers (physical and virtual) spread over two sites. The CDC data is stored on one SAN. The CDN data is stored on two SANs. All three SANs are spread over the above mentioned two sites. The Belgian SAN equipment consists out of two different kinds of physical devices. The total storage capacity is 70T approximately. The Belgian SAN solution is complex because of historical reasons. In the future, this complex environment will be replaced by a one SAN solution that combines the CDC and the CDN storage on 200T storage boxes in each site.

VI. CONCLUSION

The availability of data is critical for a mission to succeed. A high-availability solution reduces the effects of a hardware or software failure on operations and maintains the availability of data so that the perceived downtime for users is minimized or even non-existent. There are many approaches to achieving data high availability. A Storage Area Network is one of these approaches. The EUROCORPS SAN solution is different from the Belgian Defense SAN solution. This paper has outlined some of these differences in order to inform the reader on basic SAN theory used in two different military environments.