

A Dilog Alternative For The RA80/81 Disk Support Dilemma

Background

In the late 80s and early 90s, the most common fixed disk systems sold by Digital Equipment Corporation were the RA80 and RA81 using the DEC proprietary SDI interface. The SDI drives required an expensive HSC50/70 controller that was designed for use in clustered systems, but were required even for single processor applications.

After market suppliers of disk subsystems recognized and responded to the need for economical equivalents and added significantly to this installed base using popular MSCP emulating Unibus and Qbus (and even some BI bus) controllers from Dilog, Emulex, CMD and others. Typically, these systems were based on disks using SMD or ESDI interfaces. A great many of these systems are still operating today.

The Problem

The world of disks has changed dramatically since the days of the "RA" systems. Most notably is the fact that virtually all production of SMD, ESDI and SDI disks have ceased. This presents an interesting predicament for users of RA and MSCP emulating systems with drives using these obsolete interfaces.

For those still running in a clustered environment, there is very little they can do except to depend on companies that may have a limited number of unused drives in their inventories. However, the prices being asked by any one that may possess these unused SMD or ESDI disk drives is as a rule astronomical (by today's disk price standards). The alternative is a fast dwindling supply of available drives in the refurbished market. And by today's standards, the reliability of either alternative leaves something to be desired.

The Dilemma

Every time one of the drives go down and must be replaced, the user is faced with the difficult decision between continuing to keep the present system alive, changing to a modern disk system with newer interface drives or replacing the whole computer system.

Does it make sense to just live with the problem until drives are no longer available, and then seek a solution?

Going to a newer disk system will probably involve changes to the software. The original system programmers may no longer be around, or worse yet, the company using the system isn't the same as the one that wrote the application software in the first place. And, when one considers all that time required to make the changes - is it worth it?

Replace the whole system? - A major undertaking, besides, isn't it a shame to have to replace a system that has been functional for perhaps 8 -10 years and except for the perplexing disk problem will probably continue being productive for some time to come?

An Alternative to the Rescue

Wouldn't it be nice if one could simply replace the existing disk subsystem with another using new state of the art SCSI drives without having to alter any software whatsoever? The disk drives being sold today are much more reliable by almost a factor of 10 (up to 1,000,000 hours MTBF). Performance is greatly improved. Plus they are smaller (generally 3 1/2" form factor) and consume less power (7-12 watts ea.).

In many cases, where the computer being used has a Unibus (PDP-11) or Q bus (MicroVax), this is not only possible, it is simple to implement.

How is it done? We take one of our latest standard MSCP emulating SCSI disk controllers, either Q-bus or Unibus, and connect up one or more of today's high performance SCSI disk drives. Then, in order to fool the operating system, we modify the controller firmware so that no matter what disk drive we actually connect, it is reported as having the exact same capacity as the drive we wish to replace. The operating

system remains perfectly happy because it sees the correct disk size. It has no idea that anything other than the original disk type is now on line. Up to seven drives can be connected to a single controller in this manner.

Now you may ask "isn't this a waste of disk capacity? " After all, the smallest capacity SCSI disk being sold today is several times that of the unit being replaced. This is true. The RA81 had 445 MB while the smallest SCSI drive now being manufactured is 4.5GB. However, remember that the price of the new SCSI drive is much less than the refurbished cost of the old drive. That's a bargain regardless of the unused capacity.

And That Isn't All

There is also a bonus to be had. The performance improvement will be noticeable.

There are two basic components that determine a disks performance; the access time which is a combination of the rotational speed and the head actuators ability to move from one track to another, and the data rate which is a combination of bit density and rotational speed,. The first has to do with how quickly the head is positioned over the desired track and the data to be read passes under it. The second determines how fast the data is written or read from the surface of the disk once the head is in position.

Even if your system is unable to take advantage of the data rate increase, it will see and benefit from the improvement in access time.

The Bottom Line

Are you using an HSC in a non-clustered environment just for the RA81 disk system? Well get rid of it too. The Dilog controllers plug directly into a Q-bus or Unibus backplane within the computer system.

The convenience, reliability and serviceability of the modern SCSI interface drives make a compelling argument for the replacement approach. The increase in performance is a bonus. Plus, a completely configured system with up to seven drives will take up less space than a single RA80.

Who's a Candidate For This Approach?

Any one using or maintaining a DEC HSC/SDI based or MSCP emulating ESDI or SMD interface drive system on a Unibus based Vax or PDP11, or Qbus based computer including 11/23, 11/73, MicroVAX II, MicroVAX III, MicrPDP11. These use the MU and DU drivers found in RT-11, RSX11M, RSX11M+, RSTS/E, DSM(Mumps) Ultrix, Unix, MicroVMS and VMS.

WHY?

A. Plug & Play replacement with modern equipment.

B. Available for Q-bus and Unibus.

C. True MSCP emulation for total software transparency.

D. DEC diagnostic compatible.

E. Available in a multitude of completely configured systems.

F. Noticeable performance improvement.

Dilog may be reached at www.dilog.com, or (949)-476-7171