

~~C O N F I D E N T I A L~~

To: CAC Through PH, ~~ADP~~

Info: PH, PHP, PHR, SM, **SMC**

Subject: RISING SUN

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Introduction

1. The purpose of this paper to provide additional support to PH's requirement for more SUN High Performance Workstations (HPWs). PH is heavily reliant on SUN HPWs to perform operational cryptanalysis. Through the SUNs, PHP analysts and PHR programmers can access MARSIK (running FOLKLORE), BISSIN (running UNICOS) and also utilize the power of the SUNs as computers for some low level cryptanalytic processing jobs. The windowing system on the SUNs offers the analyst a powerful, flexible operating environment in which real efficiency gains have already been achieved.

2. The original RISING SUN proposal included the purchase of 10 SUN HPWs for the PH section. The proposal was rejected by DDO. The requirement for more SUNs has not diminished at all. This paper supports a reformulation of the RISING SUN proposal so that purchase can be staged. In particular is the need for immediate purchase of a number of new SUN HPWs for PH. This number is based on a minimum costing for the new SUNs to be installed on existing file servers.

PH operations

3. The number of people in PH totals about 40, with 25 in PHP and 15 in PHR. PHP operational work and PHR's cryptanalytic programming support is totally dependant on being able to gain access to the Directorate's Cray Supercomputers. With the move of PH operations to UNIX, the need to access SUN HPWs, which interface to BISSIN and MARSIK, is increasing to the point that Raytheons will soon no longer be useful. The current shortfall in SUNs is affecting PH operations. In fact, the progress of the UNIX conversion project, QUANTUM LEAP, is in danger of losing momentum because of the concession by PHR staff to priority PHP operational work performed on the SUNs. This will be explained in more detail in paragraph 8. below.

4. The number of SUN HPWs in PH totals 18 (2 are in disrepair) and the number of Raytheons totals 7. The SUN HPW to person ratio is roughly 1:2, with the Raytheons receiving very little analyst support. This 1:2 ratio is insufficient to maintain efficient PH operations.

Raytheons

5. Raytheons are old-style, monochrome, dumb, terminals used to interface to MARSIK, the Directorate's CRAY XMP 22, which runs the FOLKLORE operating system. To access MARSIK, users may either sign up on a Raytheon terminal, or sign into a SUN and access FOLKLORE through a PTS terminal emulation of the Raytheon. It should be noted that the Raytheons connect only to MARSIK, not to BISSIN. They are no longer a popular terminal with users. They are notorious for line faulting, something that doesn't occur on the SUN LAN with its fibre-optic network cabling. The Raytheons permit only single user working. They are now unsupported which means that, as they fall into disrepair, they will be taken permanently out of service. Prior to March 1992, the Raytheons will be withdrawn from service entirely. This is because the two adaptors needed to support them are to be used in configuring DIADEM, at a saving to the Directorate of more than \$ 200,000.

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SUN HPWs

6. Access to BISSIN, running UNICOS, is through the SUN network exclusively. PHP users are able to access BISSIN, MARSIK (running FOLKLORE) and take advantage of the SUNs, which are powerful computers in their own right. At this stage, the SUNs are used mainly by PHP analysts to access MARSIK. However, as PH moves to UNIX, this is changing. PHP staff now prefer to use SUNs, as advantage can be taken of the multi-user, multi-tasking environment offered by the UNIX operating system. Users can sign into MARSIK (from a SUN), run a program, bring up another FOLKLORE user and watch the output from the original executing program. They are also able to initiate other programs. In fact, up to four FOLKLORE windows can be opened and used simultaneously. In addition, any number of UNIX windows, either on the SUNs or on BISSIN, can also be opened and programs run in them. Analysts have altered their ways of working and are able to operate a lot more efficiently on the SUNs than they ever could on the Raytheons. Next year, when the second wave move draws closer, more pressure will be on experienced staff to cover expected staff shortfalls. The efficiencies obtained through using SUN HPWs will assist greatly in this respect.

7. With differing between the SUNs and the Raytheons, some operational FOLKLORE software has been modified to operate on the SUNs. In these cases, the SUN-adapted programs have become the operational, maintainable versions. Changes are made only to these versions, so that users are becoming locked into exclusively using the SUNs. In addition, some PH operational work is entirely based on SUN software.

QUANTUM LEAP

8. The general movement of PH operations is towards the UNIX operating environment. UNIX is the accepted next-generation operating system. QUANTUM LEAP is the project name for the conversion of PH operations to the UNIX environment. Currently, PHR has approximately 15 people, all of whom are exclusively bound to use the SUNs to do their job. The reason is, as stated above, that access to UNIX can only be acquired via the SUNs. The progress of QUANTUM LEAP is dependant on the availability of SUN HPWs. As PH has only 18 SUNs available operationally, PHR people often concede to PHP operational needs. This means that progress of the conversion to UNIX is being affected and that established project targets are in jeopardy of not being achieved. The squeeze on SUN HPWs will be more pronounced as PH operations switch more to UNIX operations. ie. the dependance on SUN-based working will increase.

Conclusion

9. The prospect of continuing with the current level of SUN HPWs will mean that some hard decisions will need to be made. In order to achieve the transition to UNIX, PHR, in particular, needs access to SUN HPWs. There is no other choice. Raytheons are a dying breed and not only are SUNs preferred by the PHP analysts, but they are also progressively becoming a necessity to perform day to day cryptanalytic operations. As operations shift to UNIX, the dependance on getting access to SUNs will grow across the board in PH. If extra SUNs are not bought, acknowledgement needs to be made that QUANTUM LEAP targets are threatened and recognition needs to be given that PH operational efficiencies, and hence its ability to produce a service of decrypts to PN and PB, will be affected adversely.

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Costings

Fixed Cost:-

1. Isolan 1131 fanout unit	\$ 1,125-
2. Isolan 1180 tranceiver	\$ 705-
3. 20 M Aui cable 5 x 130	\$ 650-
4. 911 M-byte IPI disk with mounting tray	\$ 20,000-
5. Power boxes	\$ 600-
6. Power cables	\$ 200-

Total Fixed Cost	\$ 23,280-

Cost of options:-

The pricings below are for 5 SUNs with 20% discounting. Options are in order of decreasing priority.

	Costing/Unit	Costing/5 Units	+	Fixed Cost
OPTION 1				
SUN IPC, 16" colour, 24 M-byte, 207 MB SCSI internal disk, 1.44 M-byte 3-1/2" floppy	\$ 14,392-	\$ 71,960-		\$ 95,240-
OPTION 2				
SUN ELC, 17" mono- chrome, 24-Mbyte, diskless	\$ 10,392-	\$ 51,960-		\$ 75,240-
OPTION 3				
SUN IPC, 16" colour, 8 M-byte, 207 MB SCSI internal disk, 1.44 M-byte 3-1/2" floppy	\$ 11,196-	\$ 55,980-		\$ 79,260-
OPTION 4				
SUN ELC, 17" mono- chrome, 8-Mbyte, diskless	\$ 7,196-	\$ 35,980-		\$ 59,260-

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Options 1 through 4 above have been ordered on the basis of the requirement for more memory to cope with the diversity of memory hungry programs that can be run on the SUNs, and the occupational health advantage afforded by colour terminals for PH people who can sit at a terminal for all of their working day.

15 August 1991

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