

Planning and Implementation for the Multiprise 3000

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Agenda



- ▶ **Planning and Implementation**
- ▶ **PCR Tool and 3000 Product Advisor**
- ▶ **IOCDS and DEVMAP**
- ▶ **Advantages and Disadvantages of EMIO**
- ▶ **Implementation of Primary and Emulated disk**
- ▶ **Early-stage difficulties**
- ▶ **FBA migration considerations**
- ▶ **Using VM pre-configured system CD-ROM**
- ▶ **Others**

***Planning
and
Implementation***

Planning and Implementation



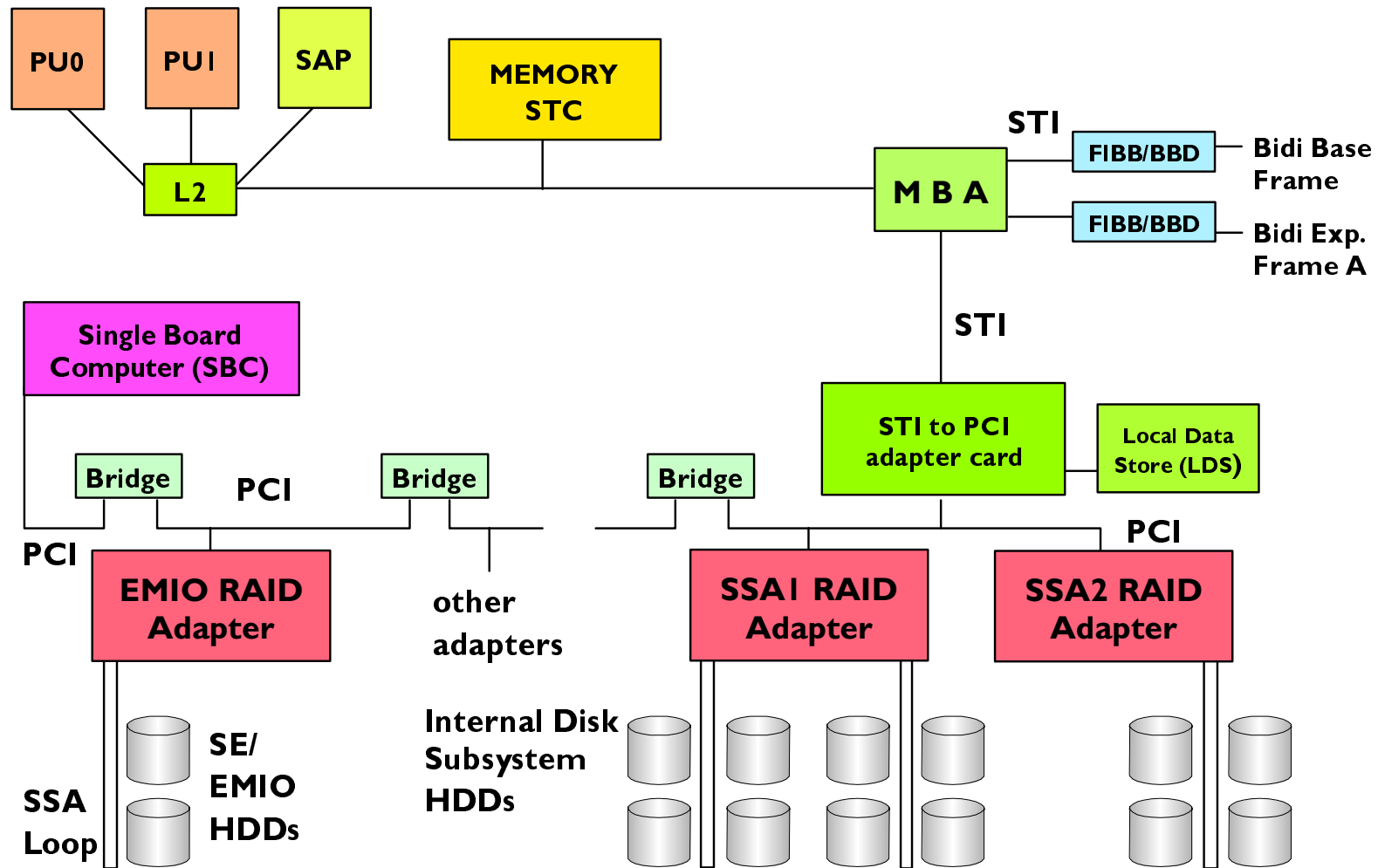
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- **Basic 7060 Structure**
- **7060 Limitations**
- **Comparisons**
- **Physical Planning using Resource Link**

7060 System Design



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Basic 7060 Structure



<i>Subject/Function</i>	<i>Multiprise 3000</i>
Machine type	H30, H50 and H70
CP/SAP	1+1, 1+1 and 2+1
Main Storage (includes disk cache, HSA)	1GB, 2GB and 4 GB
LPAR partitions	Up to 15
Cryptographic coprocessor	(0) standard, 1 (feature)
Maximum number of channels	24 in base frame, 32 in expansion frame 2 (max. of 56 ESCON and/or parallel chan. with 2 channels per card)
Maximum primary disks, base frame	16 X 18 GB drives, RAID 5, Effective 216 GB
Maximum primary disks, expansion frames	20 X 18 GB drives, max. 2, Effective 288 GB
P/390 emulated 3380/3390/FBA	3 X 9 GB drives, usable space 14 GB
LAN connections (emulated)	4, Ethernet or Token-ring or mixture
Number of expansion frames allowed	Two, "frame 2" and "frame 3"
Size (base and each expansion frame)	20" (W) X 43" (D) X 31.5" (H)
Weight	520 pounds (max. includes battery)
Integrated Battery Feature	0 (standard), 1 (feature) and 2 (feature)
Power (base, each expansion frame)	1320 watts, 120-240 volts, 50/60 Hertz, single phase

7060 Limitations



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- No external (ISC or ICB) Coupling Facility
- Internal disks (primary and emulated) cannot be shared with "external" S/390 systems
- No OSA adapter support
- No CPU sparing (there is SAP reassignment with H70)
- No FICON channel support
- Single Board Computer (SBC) does not have redundant hardware for recovery purposes
- SBC does not have concurrent maintenance
- No Concurrent Channel Maintenance

Processor Comparisons



	Integrated Server	9672 G5, G6	Multiprise 2000	Multiprise 3000
PU	P390E	G5/G6 design	G3 design	G5 design
CP/SAP	1+0	1+1 to 12+2	1+1 to 5+1	1+1, 2+1
LPAR	N/A	15 partitions	10 Partitions	15 Partitions
Crypto Chips	N/A	2	1, 2 Optional	1 Optional
RAM Memory	256 MB	1-32 GB	128 MB-4 GB	1 GB, 2 GB, 4 GB

Functional differences via <http://w3.viewblue.ibm.com> (QASearch)
 RTA000159565 - G3, G4, G5, G6, 7060, 2003, StarterPak 3000
 RTA000102197 - G1, G2, G3, G4, G5, 2003, StarterPak 3000
 RTA000021439 - ES/9021, ES/3090
 RTA000029878 - ES/9021, ES/3090, ES/9121

DASD Comparisons



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	Integrated Server	9672 G5 & G6	Multiprise 2000	Multiprise 3000
Internal Disk	Emulated I/O	N/A	DASD Processor & Cache	DASD Processor & Cache
Speed	7.2K RPM	N/A	7.2K RPM	10K RPM
Architecture	SSA RAID-5	N/A	SCSI RAID-1	SSA RAID-5
Drive size	18 GB	N/A	9 GB/18 GB	18 GB
Total Maximum	255 GB	N/A	576 GB	792 GB

Connectivity Comparisons



	Integrated Server	9672 G5/6	Multiprise 2000	Multiprise 3000
ESCON	2	256	128	56
MIF	N/A	YES	YES	YES
Parallel	4	96	96	56
FICON	N/A	24	N/A	N/A
Max Channels	4	256	128	56
OSA	N/A	12+12*	4-6	N/A
PCI	8	N/A	N/A	8
Sysplex	N/A	Full Function	ICMF only	IC, ICMF only

Physical Planning



■ Power

– Minimum of 4 power feeds (single-phase power)

- two outlets for the Base Frame and two each for the I/O and DASD Frames, if installed
- one outlet for the display attached to the Support Element
- one outlet for testing equipment

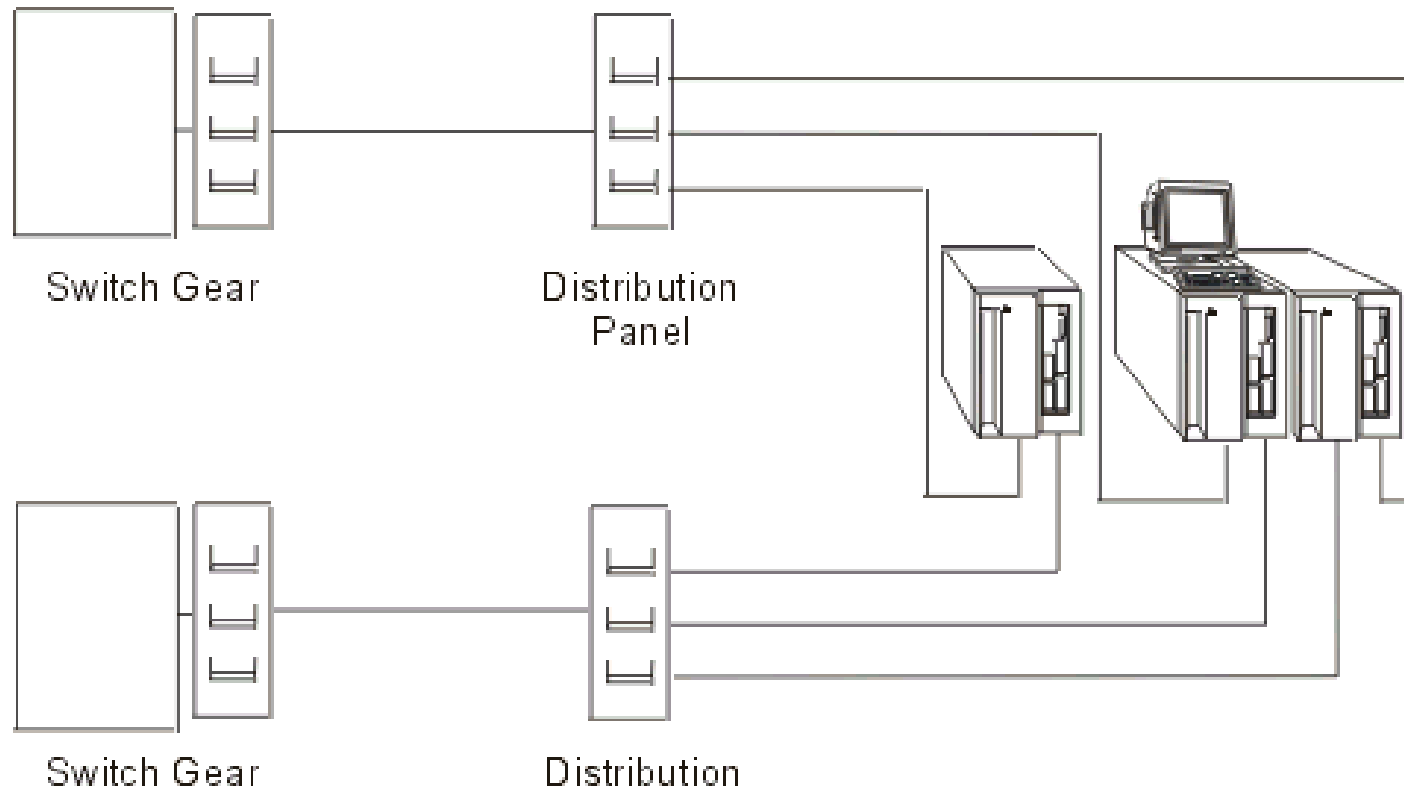
– Optional equipment

- HMC (one for the system unit, one for display, one for modem)
- one outlet for an Ethernet Hub, if installed for SE

Physical Planning

Dual Power Installation

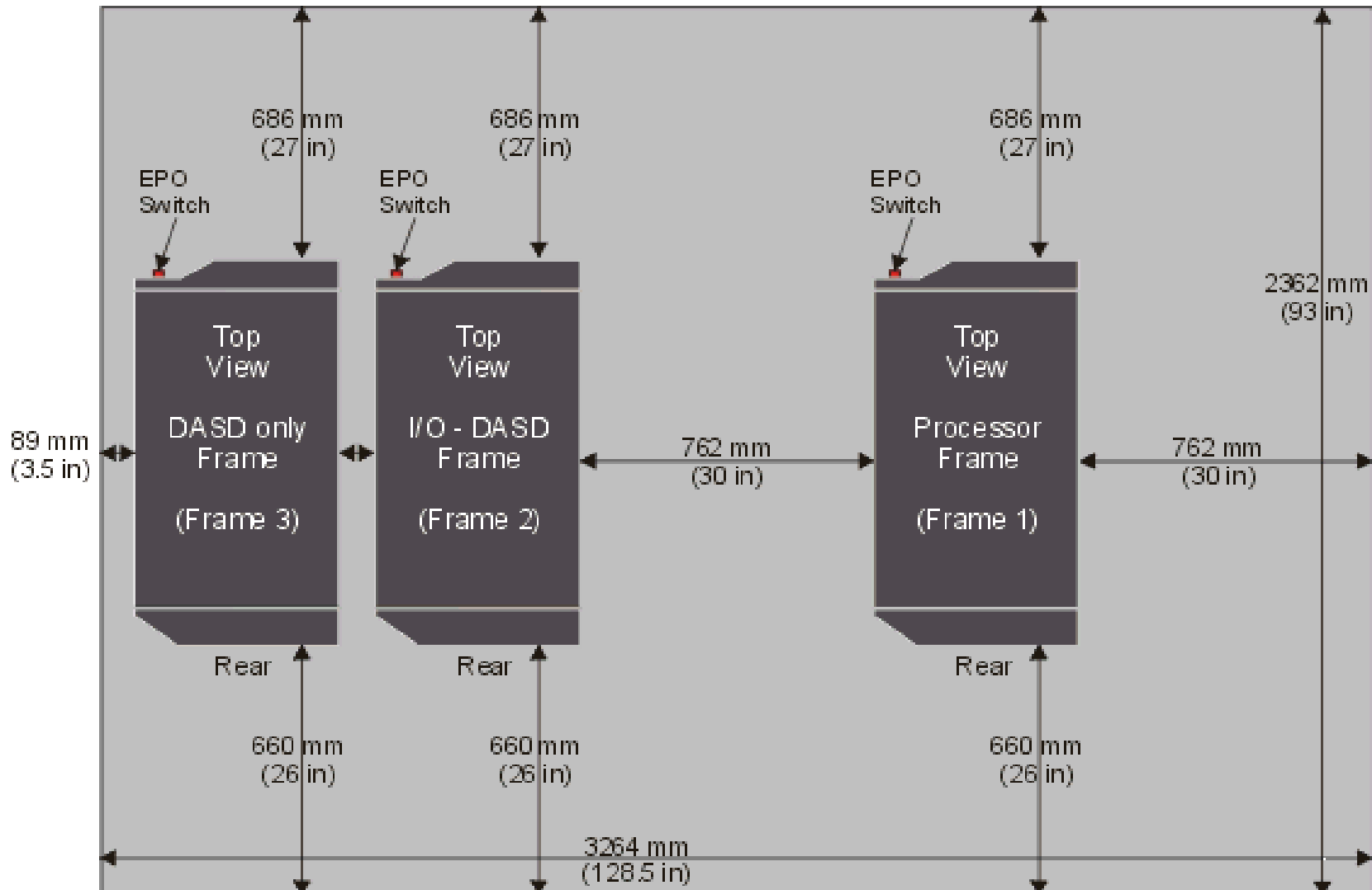
Redundant Distribution Panel and Switch Gear



Physical Planning

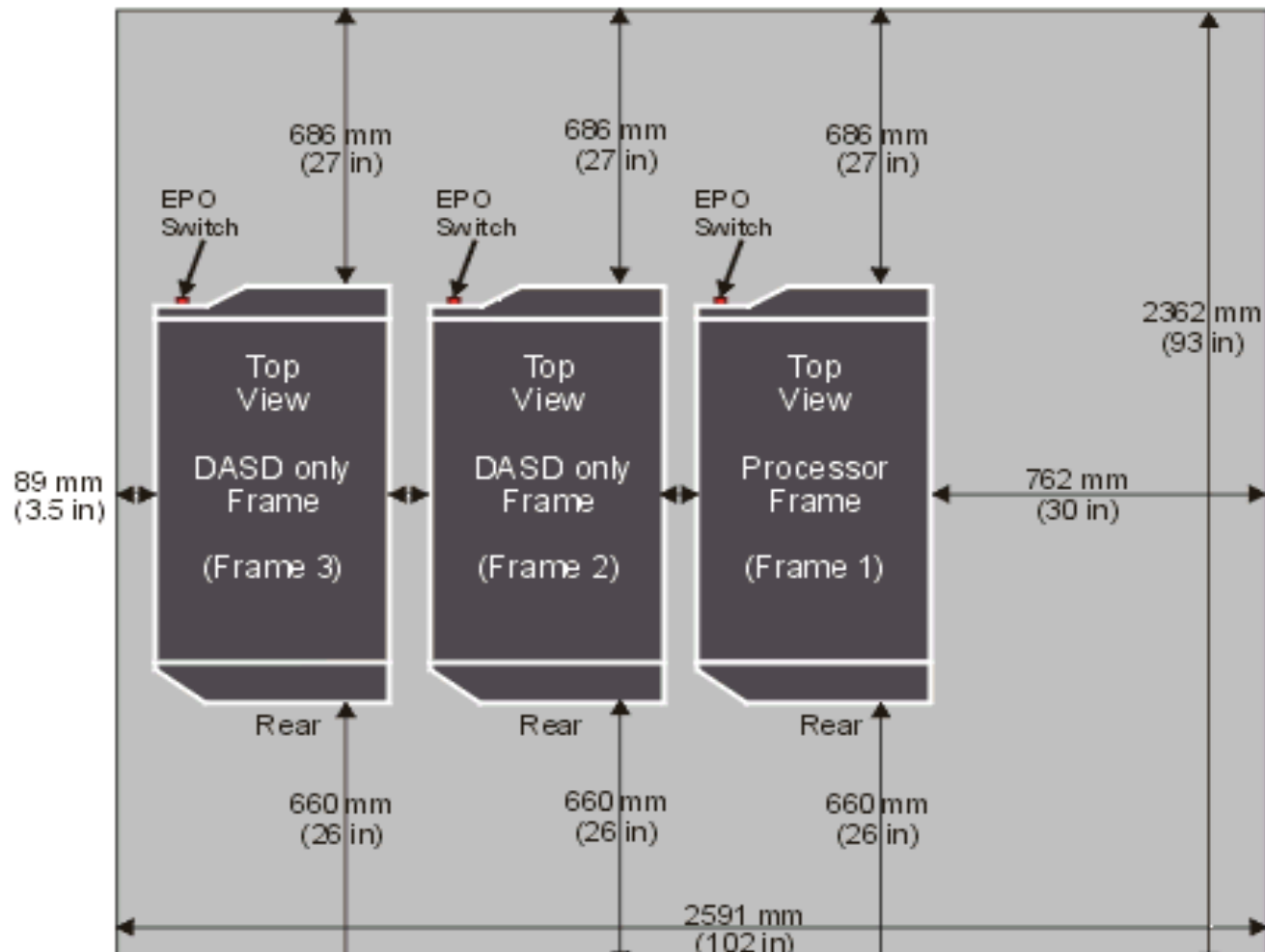


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Max. distance between Processor Frame and I/O - DASD frame 1.3 meter (51 inches) because of 3.3 meter STI/USI cables .

Physical Planning



- Processor Frame and DASD only Frame (no I/O in Frame 2)
- Another configuration is the "front to back" with Processor Frame and I/O -DASD Frame

***PCR Tool and 3000 Product
Advisor***

Hardware Withdrawal



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Withdrawal Announcement
January 18, 2000



Hardware Withdrawal: Selected S/390 Products and Features – Replacements Available

Overview

Effective February 5, 2000, IBM will withdraw selected new build products and selected product features.

- 2003-1xx — New builds **(All Models 1xx)**
- 2003-2xx — Selected models — New builds **(Models 202-207 and 215)**
- 3000 — New builds and features
- 9032-003 — Selected features
- 9033-004 — Selected features
- 9037-001 — Selected features
- 9662-P390 — All
- 9662-R390 — All
- 9672-R*4 — All features (New builds previously withdrawn)
- 9672-G5 and G6 — Selected features

Note : Still available 2003 Models are 216,224,225,227,2C5,237,246,247,257

PCR Tool



- **Processor Capacity Reference (PCR)**
 - PC based productivity tool (windows 95/98/NT)
 - Provides a basic analysis functions related to capacity planning
 - Based on LSPR data
 - <http://partners.boulder.ibm.com>
 - <http://w3.ibm.com/support/wsc>
- **Processor Selection Guide (PSG) - within PCR**
 - PCR V2.2c
 - Provide approximate capacity projection for various workload type, generally in terms of the number of users supported on a processor, or the utilization expected on a processor to support a fixed number of users or a fixed amount of resource.
 - TSO, CICS/DB2, CICS/VSAM, IMS/DL1 and IMS/DB2
- **VSE Quick Migration Sizer**
 - Supporting 1 way to 12 way processors
 - Supporting multiple VSE releases

3000 Product Advisor



■ Multiprise 3000 Product Advisor

- Requires you to answer questions reflecting your current conditions
 - What is your current product family, machine type, operating system level, cpu utilization during peak time in percent, growth percentage per year ?
 - How many years before you think you need a processor technology upgrade ?
 - What software environment would you like to run on ?
- 167 different processors models
- Factoring a 25 % additional capacity in it's calibration
- Based on LSPR data
- <http://www.s390.ibm.com/multiprise>

IOCDS and DEVMAP

IOCDS and DEVMAP



The IOCDS definitions (in IOCDS A2) for these emulated drives could be:

```
CHPID PATH=FC,TYPE=EIO
CNTLUNIT CUNUMBR=FC40,PATH=(FC),UNITADD=((40,1)),UNIT=3990
IODEVICE ADDRESS=(0A87),CUNUMBR=(FC40),UNIT=3390,UNITADD=40
```

```
CNTLUNIT CUNUMBR=FC41,PATH=(FC),UNITADD=((41,1)),UNIT=3990
IODEVICE ADDRESS=(0A88),CUNUMBR=(FC41),UNIT=3390,UNITADD=41
```

For example, assume we have TWO 3390 drives defined in DEVMAP 2:

Addr	Device	Label	Type	Size	Mgr.	FN/P
40	3390	VOL001	CKD	1113C	2	G:\LOCAL\VOL001.A87
41	3390	VOL002	CKD	1113C	2	G:\VOL002.A88

Emulated I/O Device Managers



Table 1-1 (Page 1 of 2). Device Managers Available on S/390 Operating Systems

Device Manager	Function	DEVTYPE	S/390 Operating Systems Supported
AWSCKD	Count-key-data (CKD or ECKD-capable) DASD emulator	3330, 3350, 3375, 3380, 3390, 9345	VSE, OS/390, VM
AWSFBA	Fixed-block-architecture (FBA) DASD emulator	FB-612, 0671, 3310, 3370, 9332, 9335, 9336	VSE, VM
AWSICA	Integrated communication adapter (ICA) support for SDLC and BSC protocols	SDLC ICA BSC ICA	VSE, VM
AWSOMA	Optical media attach	3422, 3423	VSE, OS/390, VM
AWSPCSR	Accesses OS/2 files		VSE, VM
AWSTAPE	9-track tape emulator	3422 (3803 control unit)	VSE, OS/390, VM
AWS2540	2540 Card Reader emulator	2540	VSE, OS/390, VM
AWS2821	Printer manager	1403 (2821 control unit)	VSE, OS/390, VM
AWS3215	Typewriter keyboard emulator	3215	VM, Standalone utilities
AWS3274	3274 control unit emulator (non-SNA)	3277, 3278, 3279, 3287	VSE, OS/390, VM
LAN3172	3172 LAN Gateway (SNA)	3068	VSE, OS/390, VM
LAN3274	LAN 3270 sessions (non-SNA)	3277, 3278, 3279, 3287	VSE, OS/390, VM

Emulated I/O Device Managers



Table 1-1 (Page 2 of 2). Device Managers Available on S/390 Operating Systems

Device Manager	Function	DEVTYPE	S/390 Operating Systems Supported
LCS3172	3172 LAN channel station for TCP/IP	3088 (even/odd address pair)	VSE, OS/390, VM
MGR3172	NetView™ function	3088	VSE, OS/390, VM
AWS34Xn	SCSI-attached 18 or 36-track tape unit or 4mm DAT tape drive emulating a tape unit	3422, 3480, 3490	VSE, OS/390, VM
WAN3172	3172 LAN Gateway (SDLC/VTAM)	3088	VSE, OS/390, VM

Note: If you have a “closed” SE desktop, then only 3270 devices can be configured using the AWS3274 device manager control unit.

In order to configure and manage EMIO communications devices (AWSICA, LCS3172, LAN3172, LAN3274, WAN3172), the System Programmer **must** have access to an “open” SE desktop which allows the execution of EMIO OS/2 utility commands at an OS/2 prompt.

In order to be able to configure and manage any other EMIO devices, the System Operator **must** be configured for an “open” SE desktop.

Advantages and Disadvantages of EMIO

Adv. and Disadv. of EMIO



■ **Advantages:**

- ▶ Less expensive than corresponding "real" S/390 I/O devices
- ▶ Less power and space

■ **Disadvantages:**

- ▶ Often slower than corresponding "real" devices
- ▶ EMIO pass through a single interface, where as real I/O may support multiple channel paths
- ▶ Emulation of CCW's is not complete, such as diagnostic functions are not emulated
- ▶ Emulated I/O depends on the emulation programs (the device managers) and OS/2 and a PC processor
- ▶ Acceptable to most P/390 users, but it is not as robust as traditional mainframe hardware

Implementation of Primary and Emulated disk

Internal Disk (primary)

Examples of Logical DASD volumes per Array

Device Type	72 GB	108 GB
3380J	51(J) + 11(E)	79(J) + 15(E)
3380E	36(E) + 1(J)	54(E) + 1(J)
3380K	24(K)+1(J)	36(K) + 1(J)
3390-1	51(1) + 11(2)	79(1)+15(2)
3390-2	36(2) + 1(1)	54(2) + 1(1)
3390-3	24(3) + 1(1)	36(3) + 1(1)
3390-9	8(9) + 1(1)	12(9) + 1(1)

Usable Total GB per Array

Device Type	72 GB	108 GB
3380J	45.99	68.67
3380E	45.36	68.04
3380K	45.99	68.04
3390-1	69.058	103.114
3390-2	68.112	102.168
3390-3	69.058	102.168
3390-9	69.058	102.168

Noted in Multiprise 3000 Reference Guide, G326-3081

Internal Disk (primary)

Internal Disk Storage Units

Number of HDD's	Number of Storage Units	Max. number of units addr.
4 + P	73	64
6 + P	109	96

Internal Disk Storage Units per Logical Volume type

Type of Logical Volume	Size in Cylinders	Required Storage units per
3390-1	1,113	1
3390-2	2,226	2
3390-3	3,339	3
3390-9	10,017	9
3380-J	885	1
3380-E	1,770	2
3380-K	2,655	3

Note: Any number and mixture of Logical Volume types can be mapped to array, only limited by the number of available storage units and unit addresses.

Internal Disk (primary)



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Base Frame

Number of HDD's	Number of Storage Units	Max. number of units addr.
4 + P (B1 72GB)	73	64 (00-3F) CUADD=0
4 + P (B2 144GB)	73	64 (40-7F) CUADD=0
4 + P (B3 216GB)	73	64 (80-BF) CUADD=0

Frame 2

Number of HDD's	Number of Storage Units	Max. number of units addr.
4 + P (E1 288GB)	73	64 (00-3F) CUADD=1
6 + P (E2 396GB)	109	96 (40-9F) CUADD=1
6 + P (E3 504GB)	109	96 (A0-FF) CUADD=1

Frame 3

Number of HDD's	Number of Storage Units	Max. number of units addr.
4 + P (E1 576GB)	73	64 (00-3F) CUADD=2
6 + P (E2 684GB)	109	96 (40-9F) CUADD=2
6 + P (E3 792GB)	109	96 (A0-FF) CUADD=2

Internal Disk (primary)



IODEVICE FOR BASE FRAME (B1)

B1 (4 + P) SERVICES

62 Logical 3390-1's (62 storage units)

1 Logical 3390-2 (2 storage units)

1 Logical 3390-9 (9 storage units)

For a total of 73 storage units and 64 addresses

Sample IOCP Statements:

CHPID PATH=FD,TYPE=DSD

CNTLUNIT PATH=(FD),CUNUMBR=01,UNITADDR=((00,64)),UNIT=3990,CUADD=0

IODEVICE ADDRESS=(100,62),CUNUMBR=01,UNIT=3390,MODEL=1

IODEVICE ADDRESS=(13E,01),CUNUMBR=01,UNIT=3390,MODEL=2

IODEVICE ADDRESS=(13F,01),CUNUMBR=01,UNIT=3390,MODEL=9

Emulated DASD



The IOCCDS definitions (in IOCCDS A2) for these emulated drives could be:

```
CHPID PATH=FC,TYPE=EIO
CNTLUNIT CUNUMBR=FC40,PATH=(FC),UNITADD=((40,1)),UNIT=3990
IODEVICE ADDRESS=(0A87),CUNUMBR=(FC40),UNIT=3390,UNITADD=40
```

```
CNTLUNIT CUNUMBR=FC41,PATH=(FC),UNITADD=((41,1)),UNIT=3990
IODEVICE ADDRESS=(0A88),CUNUMBR=(FC41),UNIT=3390,UNITADD=41
```

For example, assume we have TWO 3390 drives defined in DEVMAP 2:

Addr	Device	Label	Type	Size	Mgr.	FN/P
40	3390	VOL001	CKD	1113C	2	G:\LOCAL\VOL001.A87
41	3390	VOL002	CKD	1113C	2	G:\VOL002.A88

Early-stage difficulties

Early-stage difficulties



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- **Power Supply (fixed 11/99)**
- **4 mm DAT and CD-ROM (fixed 2/00)**
- **Configuration Combinations (fixes shipping 3/00)**
 - Caused by configuration combinations under heavy workload stress
 - Fixes will ship in March

FBA migration considerations

FBA considerations

- FBA DASD is **ONLY** available via Device Manager AWSFBA using PC hard disk (FBA is **NOT** available on "primary" internal DASD)
- **ONLY** use the "G" drive, if on the Multiprise 3000
- Max. of 14 GB effective space on the "G" drive
- Max. of 255 addresses minus the other Emulated I/O defined addresses (ex. PCOM sessions, emulated local 3270 connections, and other defined emulated I/O).
- While the Emulated I/O DASD subsystem CHPID can be shared among LPARs, the individual devices (logical volumes) may **NOT** be shared
 - Logical volumes may be shared when using the Internal Disk subsystem (primary)
- Volumes must be preallocated using EMIO or ALC.EXE utility
- OS/2 files can be located on either FAT or HPFS volumes
- See Multiprise 3000 SAPR Guide - SA99-002-xx for Emulated FBA S/390 DASD Storage Capacity (type, cylinders per DASD and OS/2 File Size (MB), section 2.2.6.1 Emulated I/O (DISK))

***Using VM pre-configured
system CD-ROM***

VM/ESA preconfig. sys. CD-ROM

- IBM S/390 Integrated Server (3006) , RS/6000, and PC Server S/390
- P/390 VM/ESA Preconfigured System CD-ROM Version 2.4.0 7/09/99
- 5654-030 FC 5777 RSU 9901 LCD4-0316-04
- NOTE: In response to customer requests, this release now provides two different DASD format VM/ESA packages on two separate CD-ROM discs:
 - ▶ 1) FBA DASD - on this CD
 - many individual OS/2 files that represent VM minidisks and CP volumes
 - Management of this system is solely via the P/390 Configurator (which runs in OS/2) for minidisk allocation and user directory administration
 - ▶ 2) 3390 DASD - on the other CD
 - two 3390 DASD volumes
 - Management of the DASD volumes must be done via the P/390 Configurator (F2 - Update System Devices menu), but you may choose to manage the user directory from VM either manually or by installing a Program Product such as DIRMAINT.
- Both packages contain IDENTICAL data in VM. You should NOT install both CDs
- Overview of product contents:
 - ▶ A. VM/ESA (ESA Feature) 2.4.0 RSU9901 s:\VMESA VMESA.PAC
 - ▶ B. VM Maintenance disks s:\VMSRC VMSRC.PAC
 - ▶ C. VM Program Products s:\VMPP VMPP.PAC
 - ▶ D. VM Program Product Source s:\VMPPSRC VMPPSRC.PAC
 - ▶ E. P/390 VM Host Server program s:\VMESA AWSHOST.PAC
 - ▶ F. Notes on the Device Map d:\VMESA
 - ▶ G. IPLing standalone utilities d:\VMESA
 - ▶ H. P/390 Sample configurations d:\VMESA
- Note: A sample configuration for running RSCS over TCP/IP is available on the P/390 FTP site:
 - ▶ ftp://P390.IBM.COM Look in README.HTM (or README.TXT) for the location of the sample file.

Others

Others



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- **ICMF vs. IC**
- **Software requirements**
- **Preloads**
- **Online pub. via Resource Link**
- **Additional pub. info.**
- **Education**

ICMF vs. IC



- Integrated Coupling Migration Facility (ICMF)
 - ▶ Does not require real channels
 - ▶ Max. of 2 Coupling Facility
 - ▶ Use Hiper-Visor (LPAR resources)
 - ▶ Support is going away
- Internal Coupling (IC)
 - ▶ Does not use of real channels (recommend CHPID A0-BF)
 - ▶ Can have up to 14 IC LPARs (max. of 15 LPARs on a 7060)
 - ▶ Better performance than ICMF

Software Support



OS/390

- OS/390 V2R7 and subsequent releases
 - OS/390 V2R4, V2R5, V2R6
- OS/390 V1.3 was not supported in the original announcement letter, it has been included as supported.
- PSP Bucket 7060DEVICE - subset ID 7060OS390

VM/ESA

- VM/ESA V2R4
 - VM/ESA V2R2, V2R3
- PSP Bucket 7060DEVICE - subset ID 7060VM/ESA

VSE/ESA

- VSE/ESA V2R4
 - VSE/ESA V2R2, V2R3
- PSP Bucket 7060DEVICE - subset ID 7060VSE/ESA

IZPIOCP V1.8.0 + PTFs

S/370 mode is not supported

Preloads



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- **F/C 7000** - OS/390 Application Based Pre-load
- **F/C 7001** - OS/390 Workload Transition Pre-load
 - ▶ see: Announcement Letter 299-271 for terms and conditions
 - 36 months waiver in the OS/390 2.6 software (**OS/390 2.8 avail. 2Q200**)
 - Websphere Application Server 1.1
 - Java 1.6
 - Service Update Facility V2 R1.2
 - ▶ see: Resource Link (Library) OS/390 2.6 Preload
 - Descriptions of volumes, security, IPL procedures and etc.
 - (8) 3390-003 volumes will be used on "primary" internal disk
- **F/C 7003** - OS/390 Application Development Pre-load
 - ▶ Focusing on COBOL, CICS and e-business development
 - ▶ see: Application Development Solution (ADS) announcement
 - ▶ Also known as "DaVinci" or 390ADS
 - ▶ Is available on H50 and H70 (Announcement Letter 299-320, which indicated 390ADS was only available on 7060 model H30)
 - ▶ OS/390 2.7 software - see Announ. Letter 299-320 for additional information (**OS/390 2.9 avail. 3Q2000**)
 - ▶ (12) 3390-003 volumes will used on "primary" internal disk

Online pub. via Resource Link



Number	Title
SC28-8141-09	Application Programming Interfaces
SG24-5669-00	Basic Emulated I/O Definitions - REDBOOK
GC38-0610-01	Emulated I/O User's Guide
GC38-0602-01	Hardware Management Console Operations Guide
GC38-0401-11	IOCP Guide and ESCON CTC Reference
SY24-6154-01a	Installation Manual
SA22-1025-00	Internal Disk Subsystem Reference Guide
SA22-1026-00	Internal Disk Subsystem User's Guide
SY22-9533-09	Link Fault Isolation
GC38-3115-03	Maintenance Information for Desktop Console
SY27-2597-07	Maintenance Information for S/390 Fiber Optic Links
GC38-0452-07	Managing Your Processors
	OS/390 Base Preload for Multiprise 3000
S123-7471-00	Parts Catalog
GA22-7236-05	PR/SM Planning Guide
SA22-7201-06	Principles of Operation
SY20-8801-01	Problem Analysis Guide
SA99-002-05	Multiprise 3000 SAPR Guide
SY20-8802-00a	Safety Inspection Guide
SY24-6155-01a	Service Guide
SY24-6162-00b	Service Guide Supplement
GC38-0458-03	Standalone IOCP User's Guide
GC38-0607-00a	Support Element Operations Guide
GA22-1029-01	System Overview

Additional pub. info.



The following publications are shipped with the product:

Order number	Title
SY20-8802	Safety Inspection
SY20-8803	Safety Notices

Other publications:

Order number	Title
GC22-7072	General Information Manual Installation Manual--Physical Planning
GC22-7064	I/O Equipment Installation Manual--Physical Planning
SG24-5633	Multiprise 3000 Technical Introduction - REDBOOK (www.redbooks.ibm.com)
SA99-002-05	Multiprise 3000 SAPR Guide tools sendto lexvmic1 tools saprdoc get sa99002 *

Education



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Available via Resource Link:

[Education](#) → [S/390](#) → [Hardware](#) → [Multiprise 3000 Enterprise Server](#) → [Courses](#)

Topic

[How to Use the Hardware Management Console](#)

[How to Use the Support Element](#)

[Installing Emulated Input/Output](#)