ITSO 2005 - z9 109 - 2094 - Hardware Workshop

Hardware Day 2 - the Blue Day

IBM System z9 - 2094 - Hardware / System

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

Agenda - Hardware day 2 - the BLUE day

- Changing I/O dynamics
- z9 Physical I/O structure Support
- z9 and zSeries Channel Subsystem Characteristics
- Introduction to zSeries and z9 I/O subchannel support
- 2094 Channel Subsystem - Subchannel Sets Support
- 2094 Subchannel Sets - Alias Device Number Support
- z/OS 1.7 HCD - 2094 Configuration Definition
- z/os 1.7 HCD Alias I/O Device Definition Demonstration
- z9 109 - 2094 Setup Sequence
- z/OS 1.7 and z/OS 1.6 - IPL Support
- z9 109 - 2094 - IOCP and OSCONFIG - Definition Statements
- z/OS 1.7 and z9 109 - UCB to UCW device Number Mapping
- z/OS System Commands usage with z9 109 2094
- z/OS 1.7 and z9 109 2094 - I/O Problem Definition Support
- z9 109 - 2094 - MIDAW Support
- z9 109 - 2094 Alternate eSTI connection
- z9 and zSeries CHPID Mapping Tool (CMT)
- Dynamic I/O reconfiguration

IBM System z9 - zSeries and z/Architecture
The changing I/O Dynamics

Information contained in this document/presentation is still going through IBM review. Updates will be made to this document. Contact the owner when you require to have the latest version of this document/presentation.

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

- I/O Growth, Performance and Availability
  - z9 109 - 2094
  - Multiple subchannel sets (MSS)
  - Doubles the # of addressable devices (Base and Alias DASD)
  - MIDAW facility
  - FICON Channels (Hydra 3) FICON-Express2
  - 64 open exchanges
  - Dynamic I/O bus (eSTI I/O domain switching)
- Consolidation
  - z990 - 2084
  - Multiple Channel Subsystems (MCSS)
  - Spanning Channels
- Performance
  - z900 - 064
    - CP
    - FICON channels

IBM System z9 109 - 2094
I/O Physical Structure

Kenneth (Ken) Trowell
zSeries Channel Development
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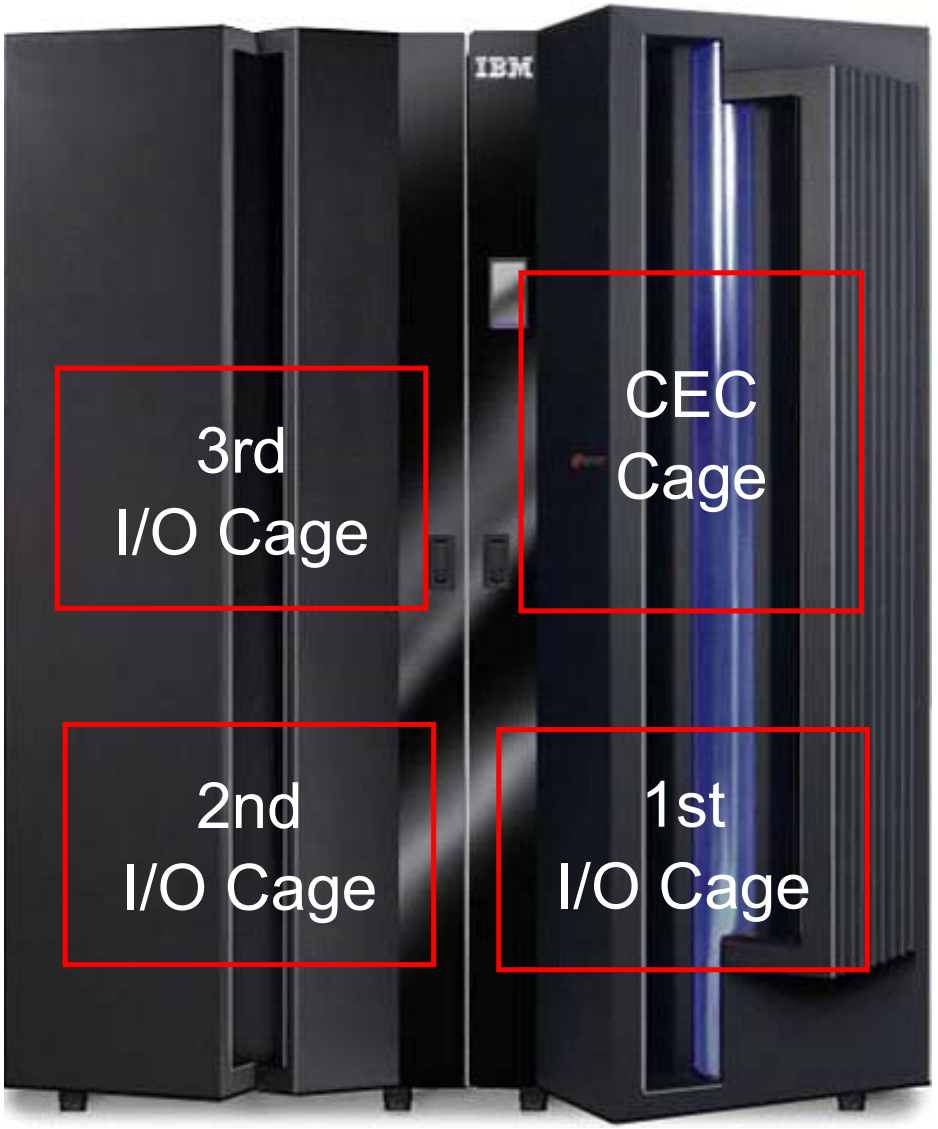
- z9 109 - 2094 (CPC)
- Fames (A and Z)
  - CEC Location
  - I/O cage location

z9 109 - 2094



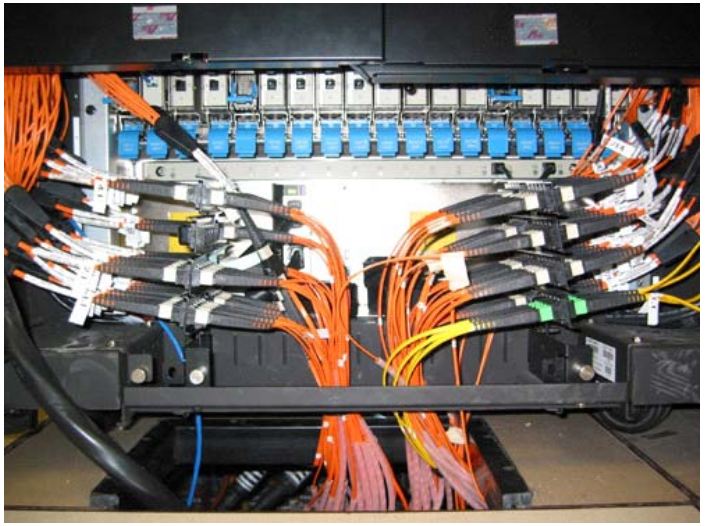
Z Frame A Frame

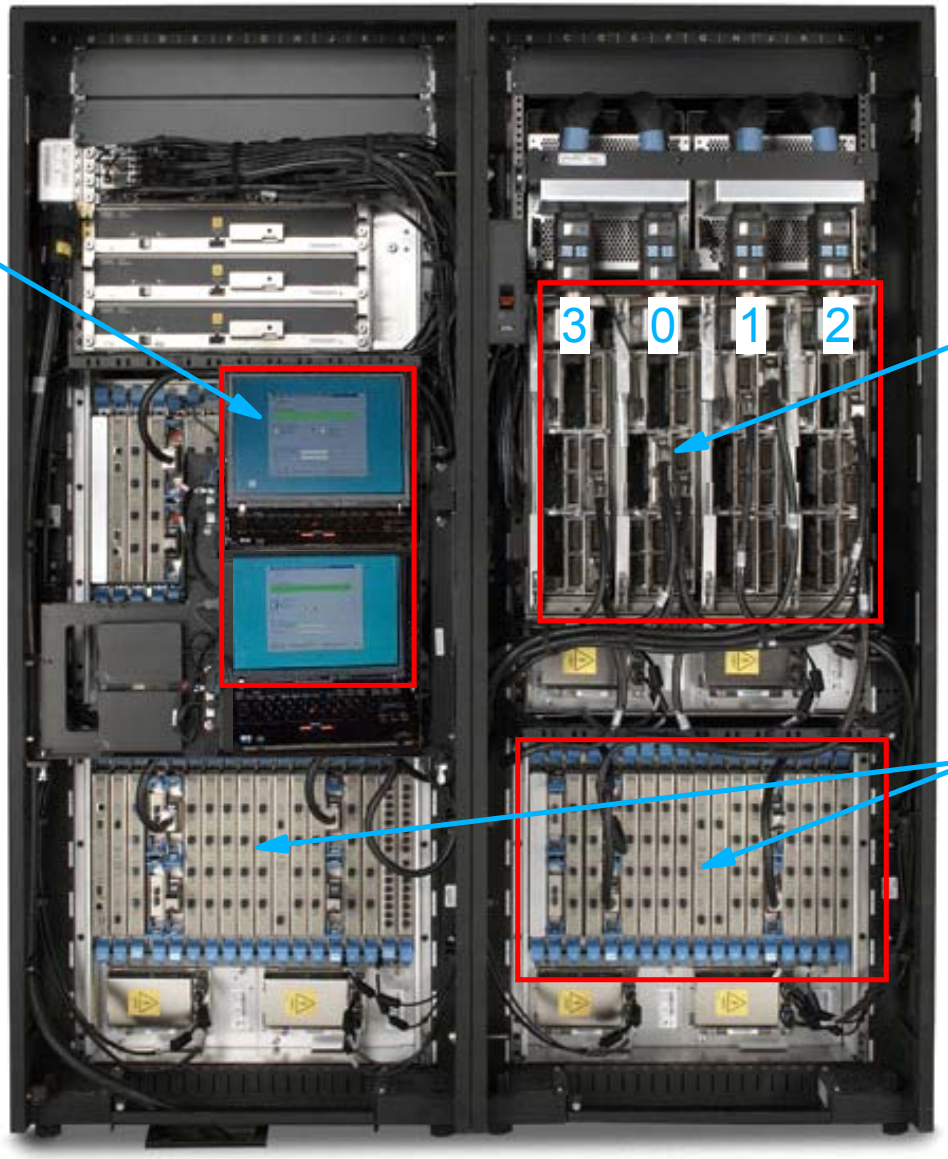
2094 Support Elements

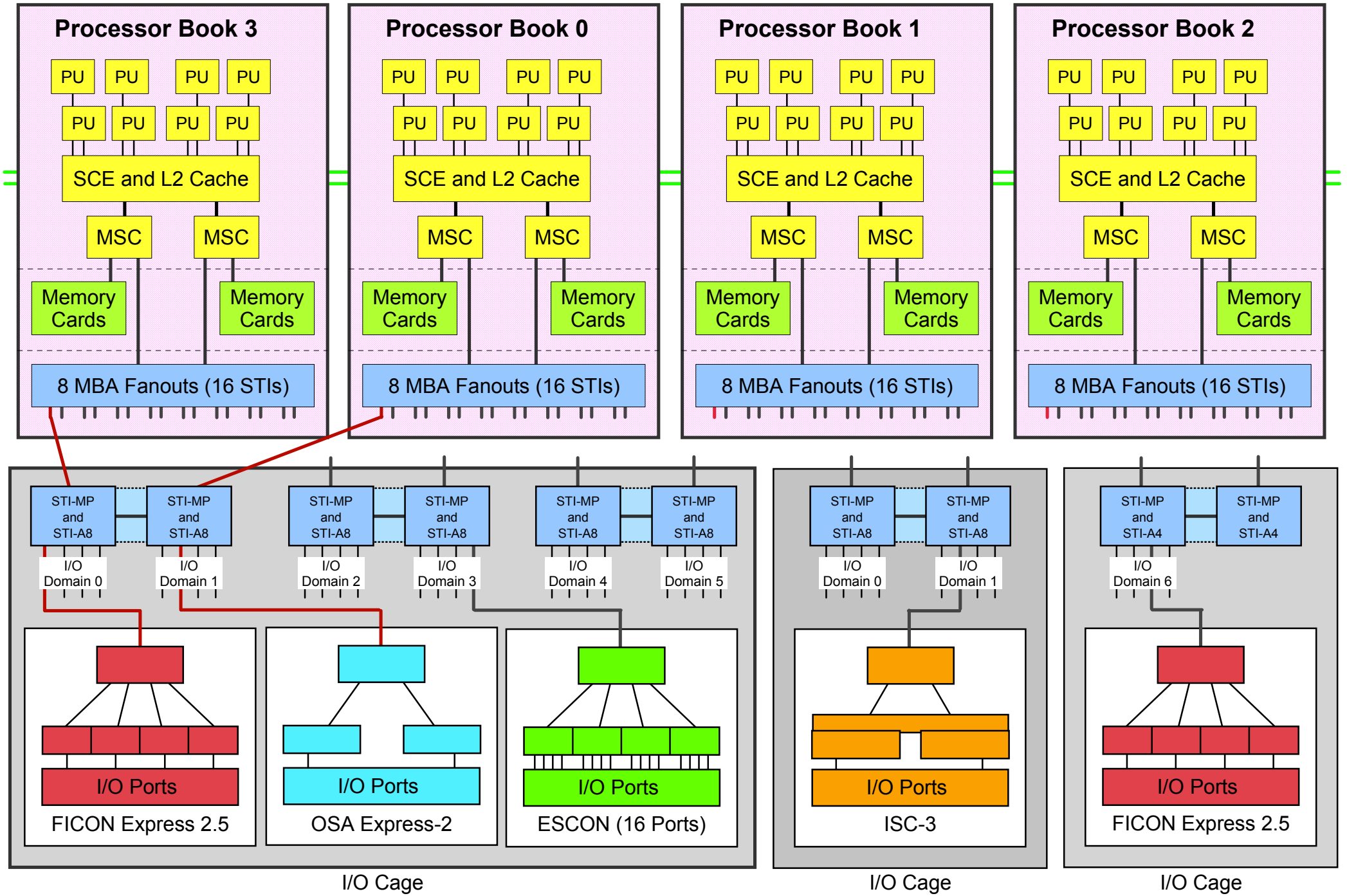
CEC Books

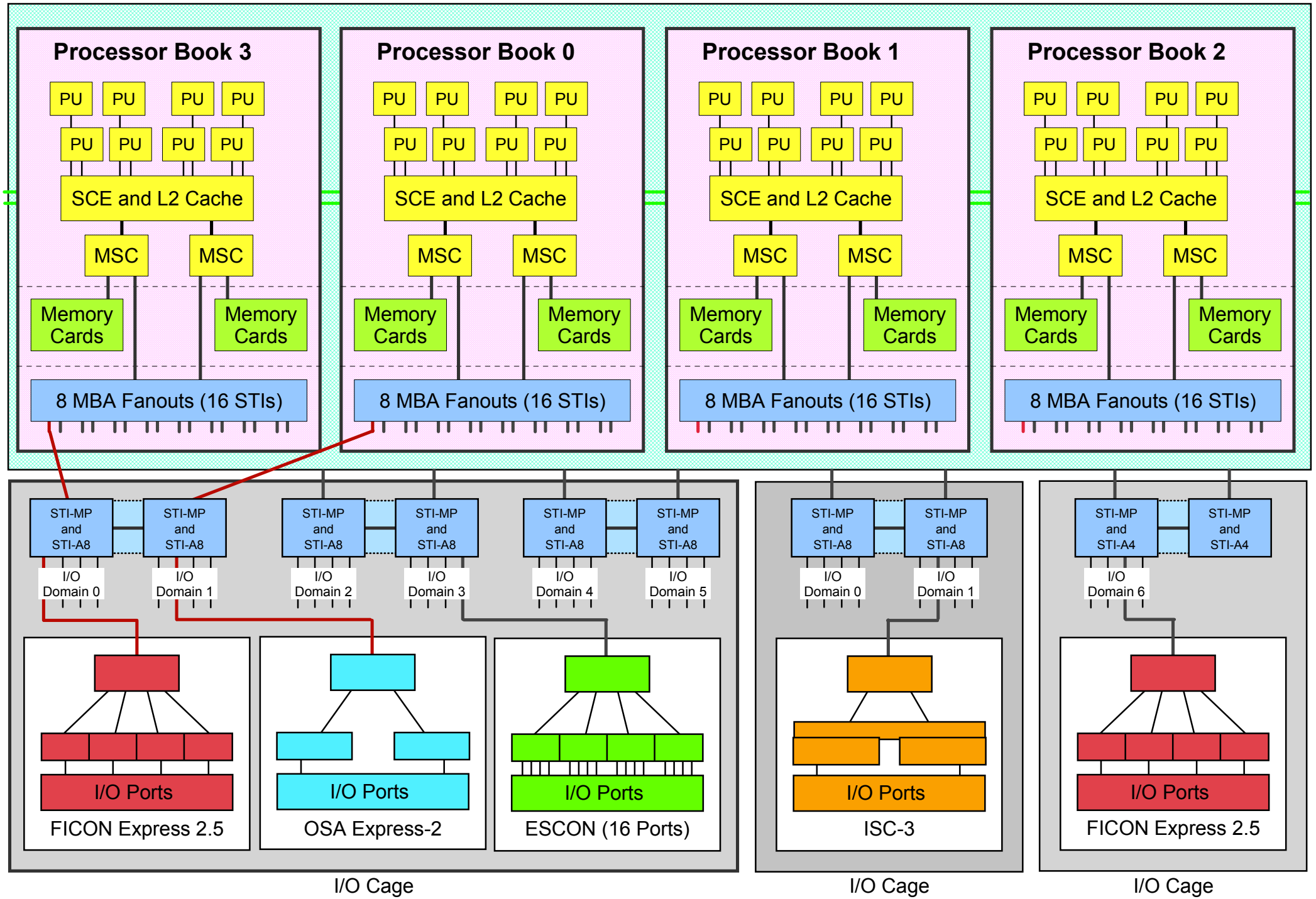
Fiber Cabling FTS / FQC

Channel Cards






Processor Book 3
Processor Book 0
Processor Book 1
Processor Book 2
PU
SCE and L2 Cache
MSC
Memory Cards
8 MBA Fanouts (16 STIs)
STI-MP and STI-A8
STI-MP and STI-A4
I/O Domain 0
I/O Domain 1
I/O Domain 2
I/O Domain 3
I/O Domain 4
I/O Domain 5
I/O Domain 6
I/O Ports
FICON Express 2.5
OSA Express-2
ESCON (16 Ports)
ISC-3
I/O Cage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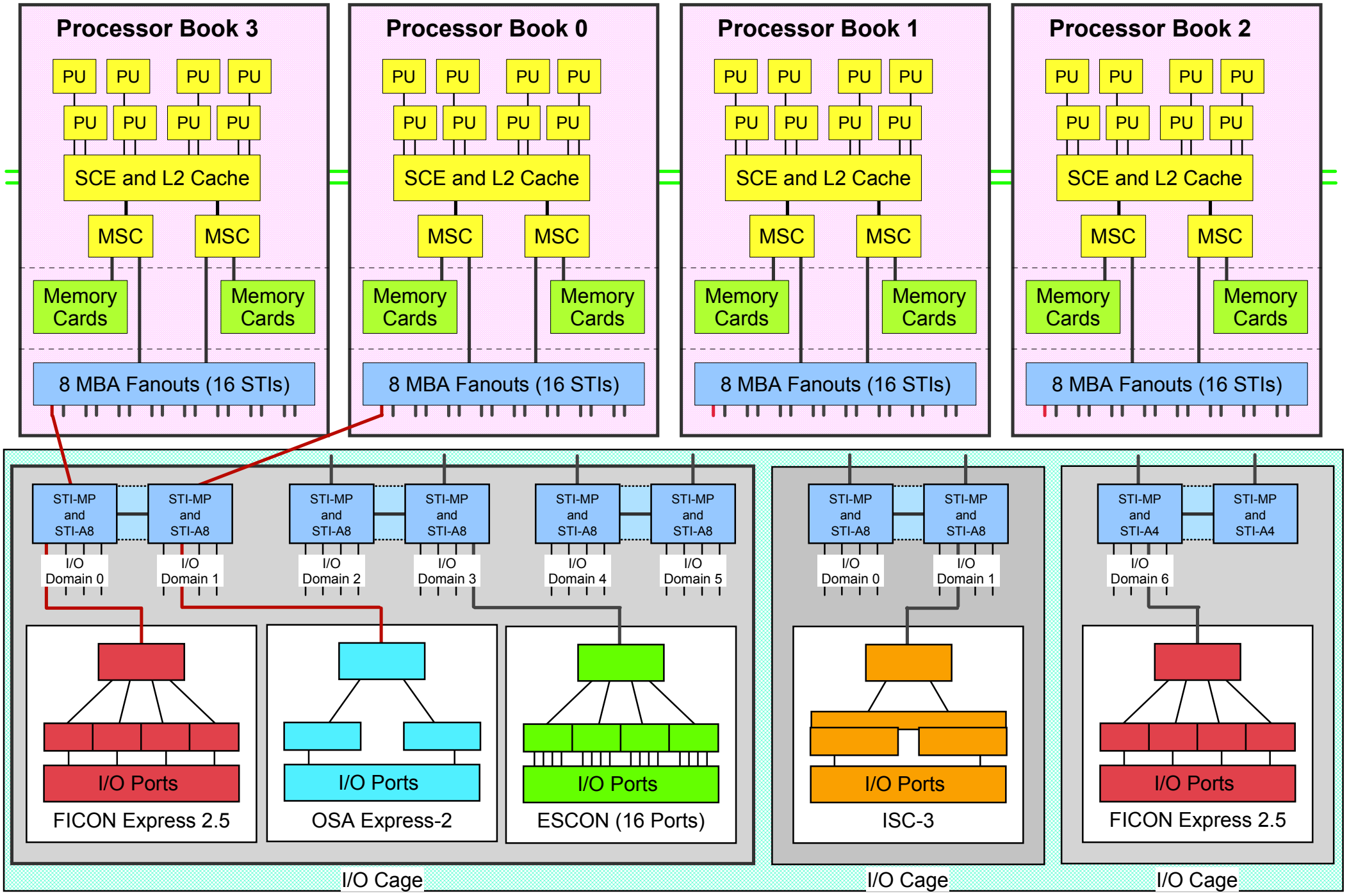
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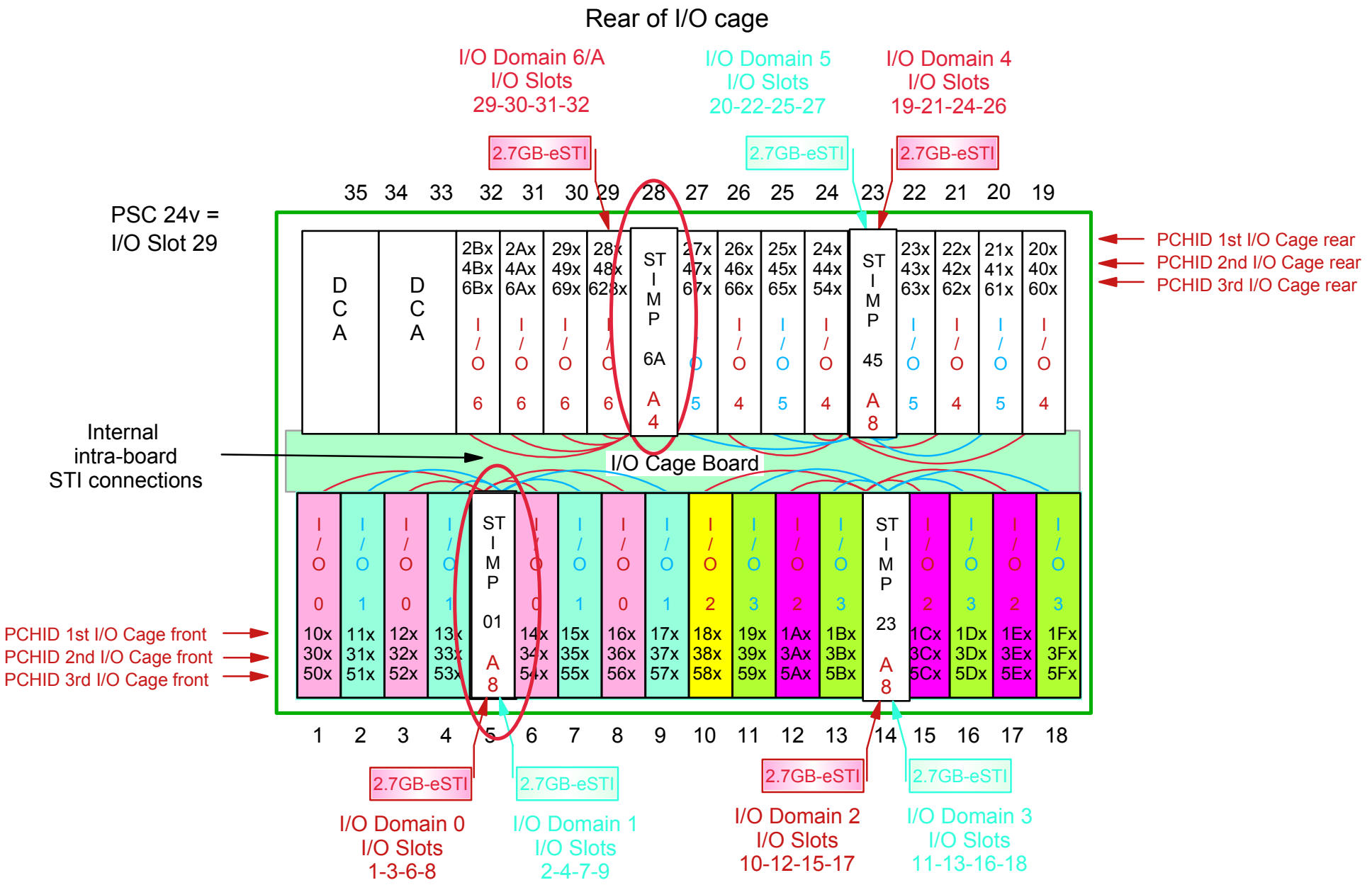
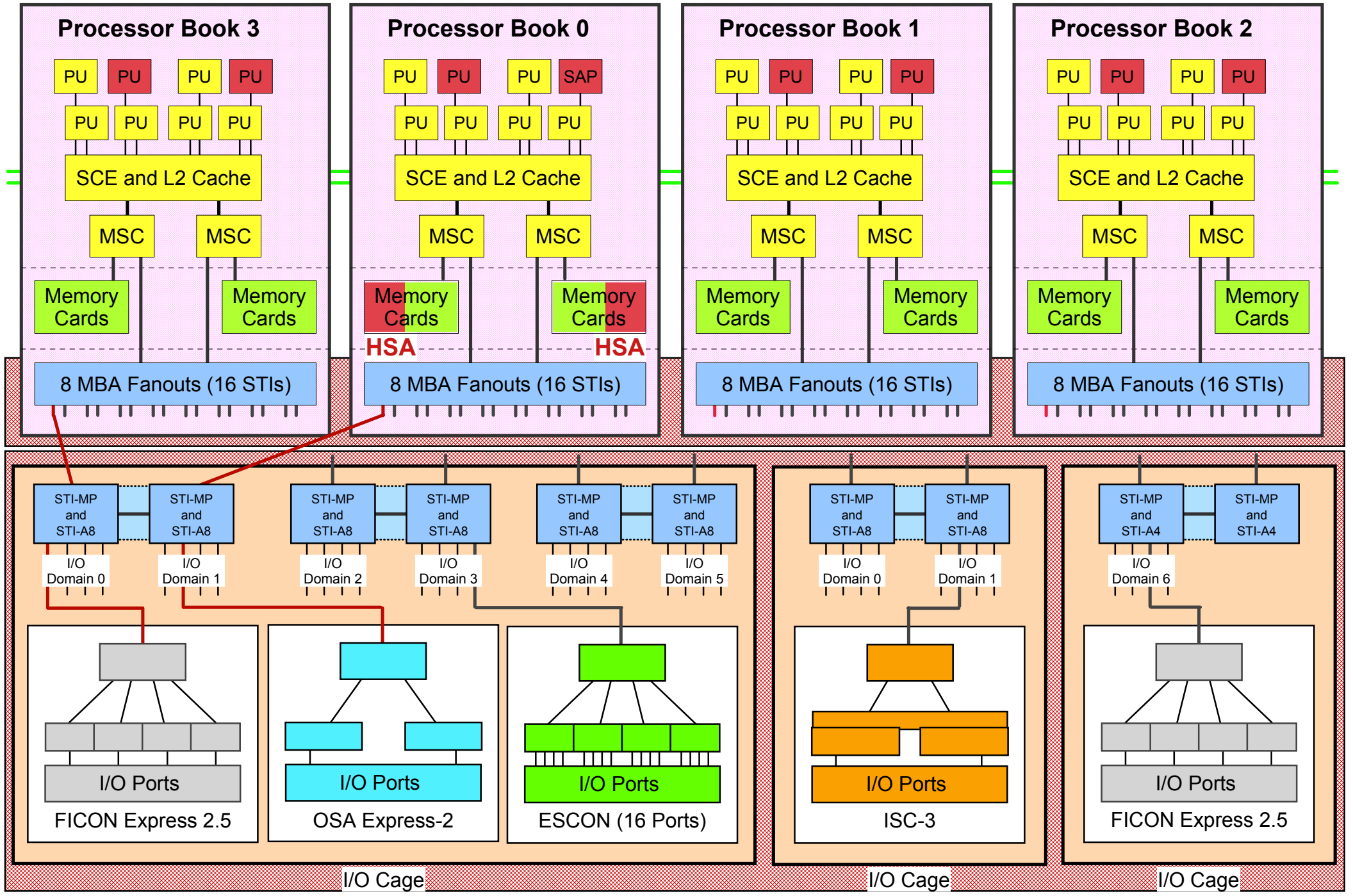

Rear of I/O cage
I/O Domain 6/A
I/O Slots
29-30-31-32
I/O Domain 5
I/O Slots
20-22-25-27
I/O Domain 4
I/O Slots
19-21-24-26
2.7GB-eSTI
2.7GB-eSTI
2.7GB-eSTI
35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19
PSC 24v =
I/O Slot 29
DCA
DCA
2Bx 4Bx 6Bx I/O 6
2Ax 4Ax 6Ax I/O 6
29x 49x 69x I/O 6
28x 48x 68x I/O 6
STI MP 6A A 4
27x 47x 67x I/O 5
26x 46x 66x I/O 4
25x 45x 65x I/O 5
24x 44x 54x I/O 4
STI MP 45 A 8
23x 43x 63x I/O 5
22x 42x 62x I/O 4
21x 41x 61x I/O 5
20x 40x 60x I/O 4
PCHID 1st I/O Cage rear
PCHID 2nd I/O Cage rear
PCHID 3rd I/O Cage rear
Internal
intra-board
STI connections
I/O Cage Board
I/O 0 10x 30x 50x
I/O 1 11x 31x 51x
I/O 0 12x 32x 52x
I/O 1 13x 33x 53x
STI MP 01 A 8
I/O 0 14x 34x 54x
I/O 1 15x 35x 55x
I/O 0 16x 36x 56x
I/O 1 17x 37x 57x
I/O 2 18x 38x 58x
I/O 3 19x 39x 59x
I/O 2 1Ax 3Ax 5Ax
I/O 3 1Bx 3Bx 5Bx
STI MP 23 A 8
I/O 2 1Cx 3Cx 5Cx
I/O 3 1Dx 3Dx 5Dx
I/O 2 1Ex 3Ex 5Ex
I/O 3 1Fx 3Fx 5Fx
PCHID 1st I/O Cage front
PCHID 2nd I/O Cage front
PCHID 3rd I/O Cage front
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
2.7GB-eSTI
2.7GB-eSTI
2.7GB-eSTI
2.7GB-eSTI
I/O Domain 0
I/O Slots
1-3-6-8
I/O Domain 1
I/O Slots
2-4-7-9
I/O Domain 2
I/O Slots
10-12-15-17
I/O Domain 3
I/O Slots
11-13-16-18
Front of I/O cage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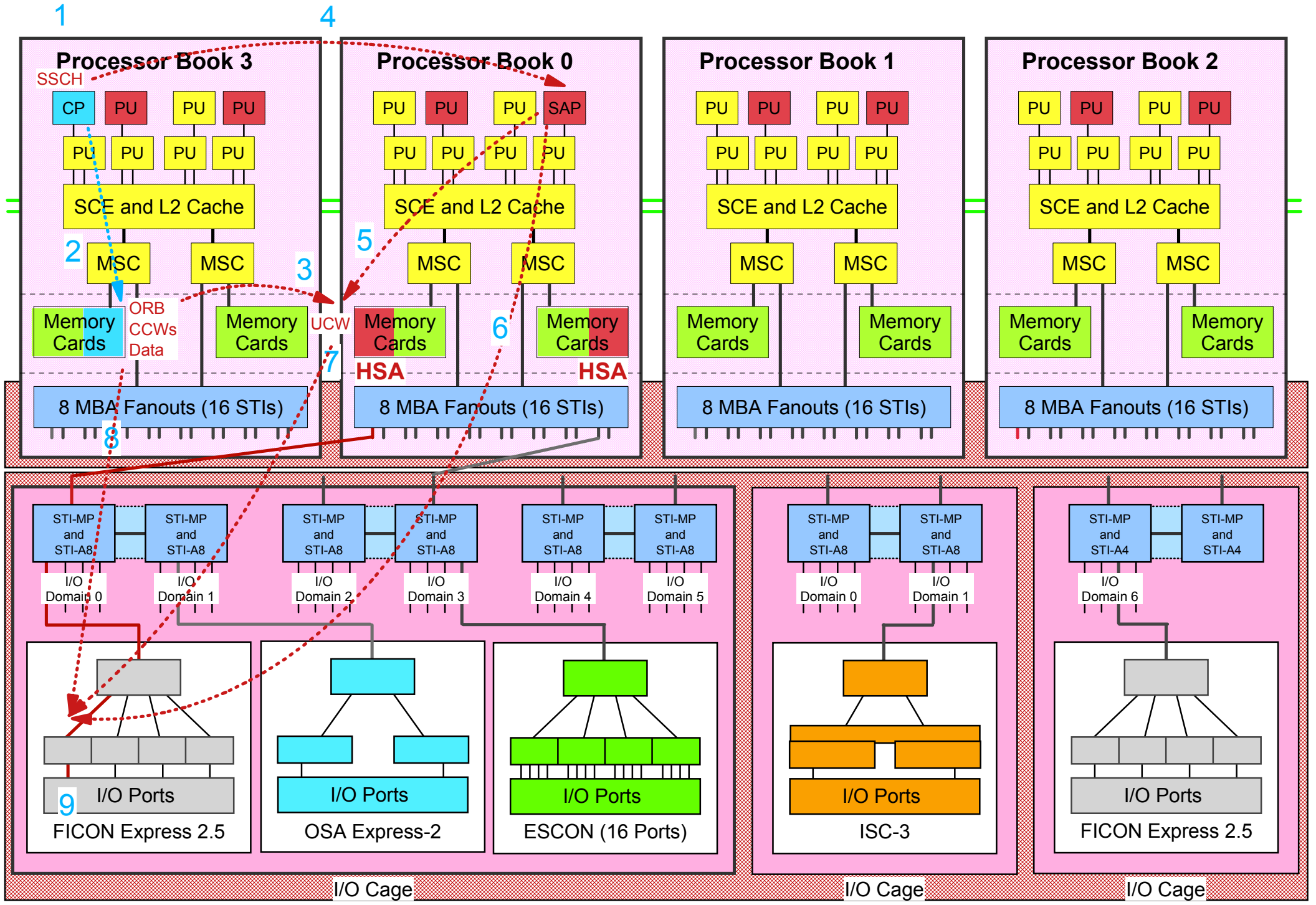
I/O Domain 6
I/O Ports
FICON Express 2.5
OSA Express-2
ESCON (16 Ports)
ISC-3
I/O Cage

IBM System z9 - Channel Subsystem Components

- CP - I/O intruction set (e.g. SSCH - TSCH - MSCH - etc)
- SAPs (System Assist Processors - IOPs)
- HSA
  - Subchannels (UCWs)
  - CSS queues
- MBAs
  - MBA fanouts
- eSTI connections
- I/O cages
  - I/O domains - Up to 7 I/O domains per I/O cage
    - **eSTI A4 / A8 - for each I/O domain**
    - **eSTI MP - for each I/O domain**
    - **Channel Cards - Up o 28 Channel Cards per I/O cage**
      - **All 28 I/O channel card slots can be Hyda types (e.g. FICON)**
    - **Channel queues**
    - **Channel controls**
      - **FICON open exchanges**
      - **FICON IUs**
      - **Fibre Channel - buffer to buffer credits**


1
4
Processor Book 3
Processor Book 0
Processor Book 1
Processor Book 2
SSCH
CP
PU
SAP
SCE and L2 Cache
2
MSC
3
5
ORB
CCWs
Data
UCW
Memory Cards
6
7
HSA
8 MBA Fanouts (16 STIs)
8
STI-MP and STI-A8
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I/O Domain 0
I/O Domain 1
I/O Domain 2
I/O Domain 3
I/O Domain 4
I/O Domain 5
I/O Domain 6
9
I/O Ports
FICON Express 2.5
OSA Express-2
ESCON (16 Ports)
ISC-3
I/O Cage

z9 Channel Subsystem I/O Operation Sequence

1. z/OS SCP - executes an SSCH instruction
2. Operands of the SSCH instruction are an SID (Subchannel ID) and ORB
3. Contents of the ORB are placed in the UCW pointed to by the SID
4. The next SAP to use is informed there is work to do
5. SAP fetches the UCW (Subchannel) - subchannels are for the CSS.ID + MIF.ID
6. The SAP selects and passes the start request to a channel defined to access the device
7. Channel fetches the subchannel
8. Channel fetches the Channel Program (CCW chain), pointed to by the CPA in the ORB
9. Channel initiates an CCW I/O operation to the CU / Device via the I/O interface (FICON)

IBM Ssystem z9 and zSeries I/O Channel Subsystem Characteristics

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

zServer zSeries Server Type	MCSS Support	Logical partitions	MSS Support	Total Subchannels Per CSS (per LPAR)	Devices (per CSS) Base Subchannel Set (SS-0)	Devices (per CSS) 2nd Subchannel Set (SS-1)	Channels	SPANNED Channels
zServer z9 109 2094	Yes 4 x CSS	60 (Maximum 15 for a CSS)	1 or 2 per CSS (Up to 8 in total)	127.75 K	65280 (64512 + 768)	65535	1024 Up to 256 per CSS	Yes
zSeries z990 2084	Yes 4 x CSS)	30 (Maximum 15 for a CSS)	No	63 K	64512	n/a	1024 Up to 256 per CSS	Yes
zSeries z890 2086	Yes 2 x CSS	30 (Maximum 15 for a CSS)	No	63K	64512	n/a	421	Yes
zSeries z900 2064	No (1 CSS)	15	No	63 K	64512	n/a	256	n/a
zSeries z800 2066	No (1 CSS)	15	No	63 K	64512	n/a	242	n/a

IBM System z9 - zSeries and z/Architecture I/O Configuration Design Subchannel Sets Introduction

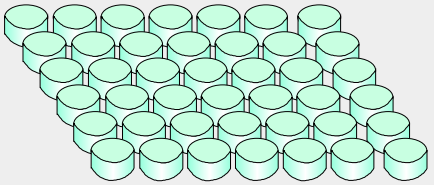
Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

zSeries 2084
Channel Subsystem
64K Subchannels

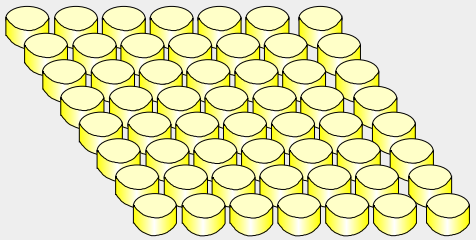
63K

Base
Base
Base
Base
Base
Base
Alias
Alias
Alias
Alias
Alias
Alias
Alias

zSeries 2084
DASD Configurations
64K Device

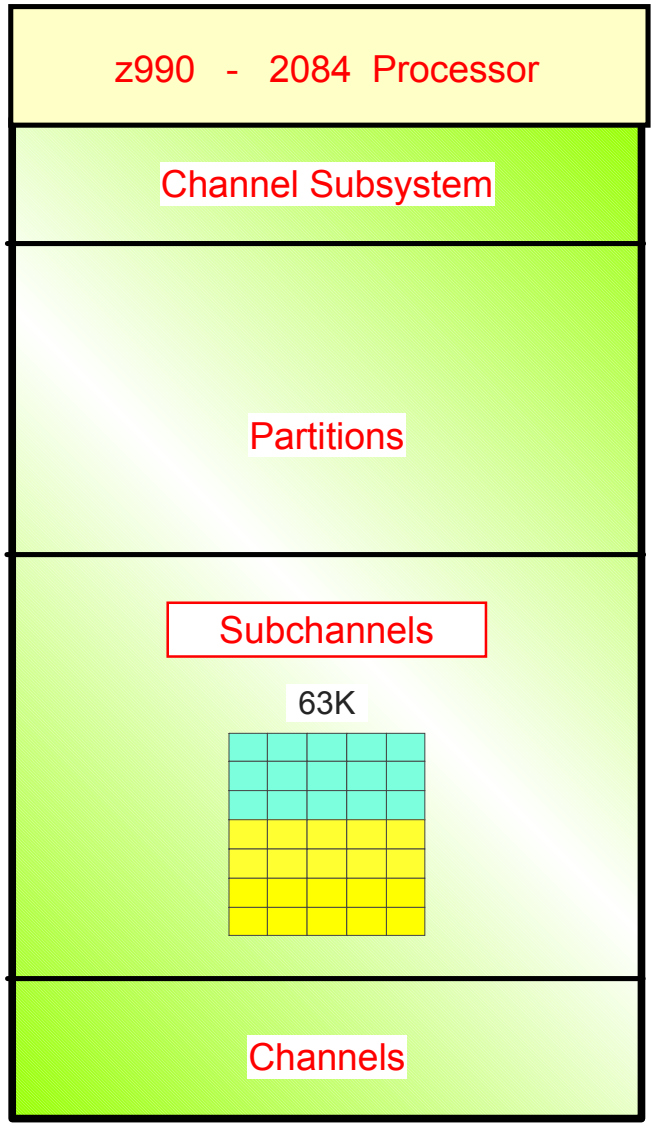


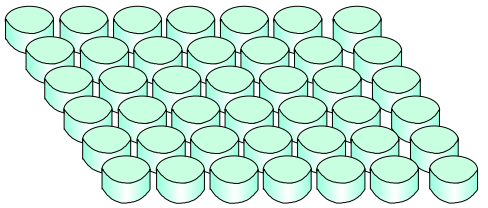
Bases

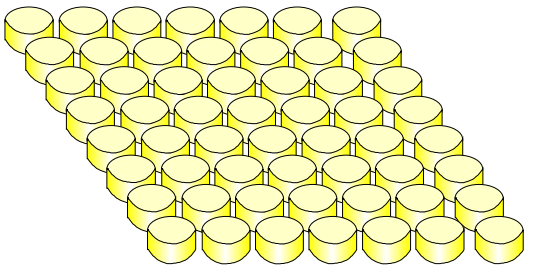


Aliases

A 2084 Channel Subsystem has one set of Subchannels

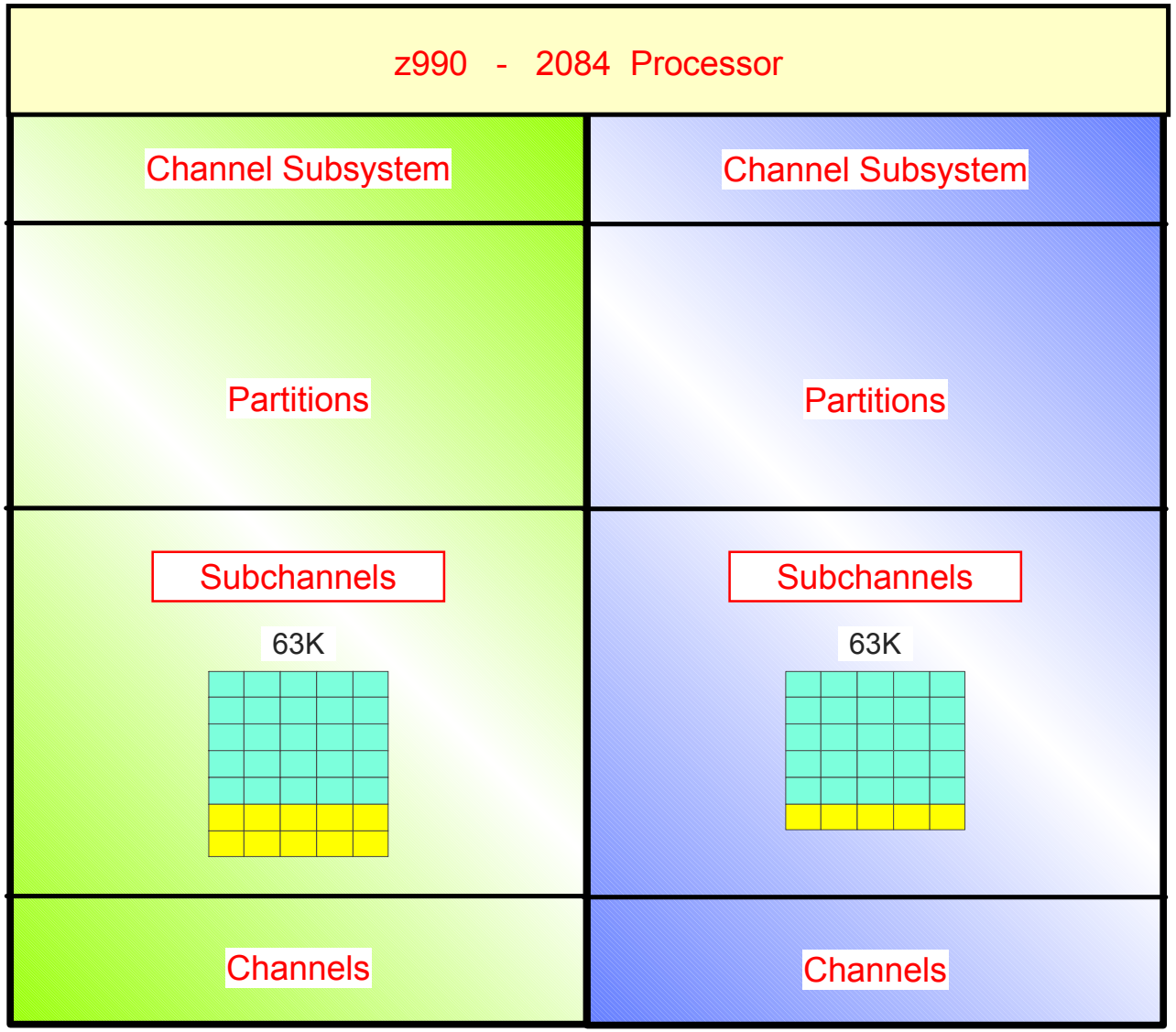


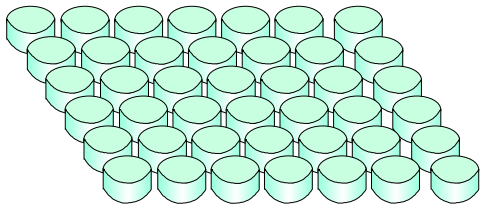




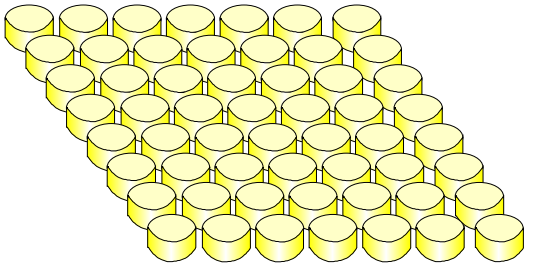
63K = 64512

2084 can have multiple Channel Subsystems and each 2084 Channel Subsystem has a set of Subchannels





Bases



Aliases

Note:There really is up to 15 single sets subchannels per CSS, one for each LPAR

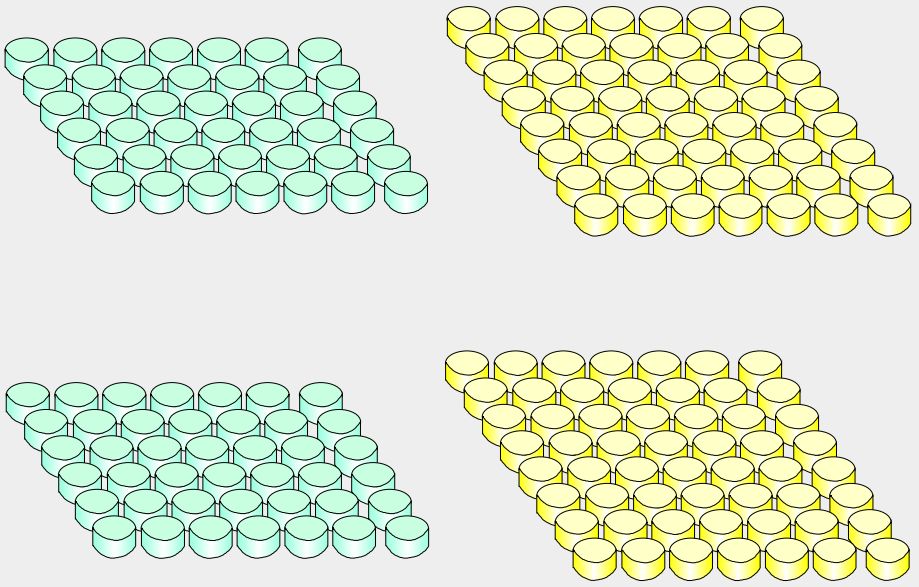
z9 - 2094
Channel Subsystem
128K Subchannels

63.75K	64K
Base	Alias
Base	Alias
Base	Alias
Base	Alias
Base	Alias
Base	Alias
Base	Alias
Base	Alias
Base	Alias
Base	Alias
Base	Alias
Base	

63.75K = 65280

64K = 65535

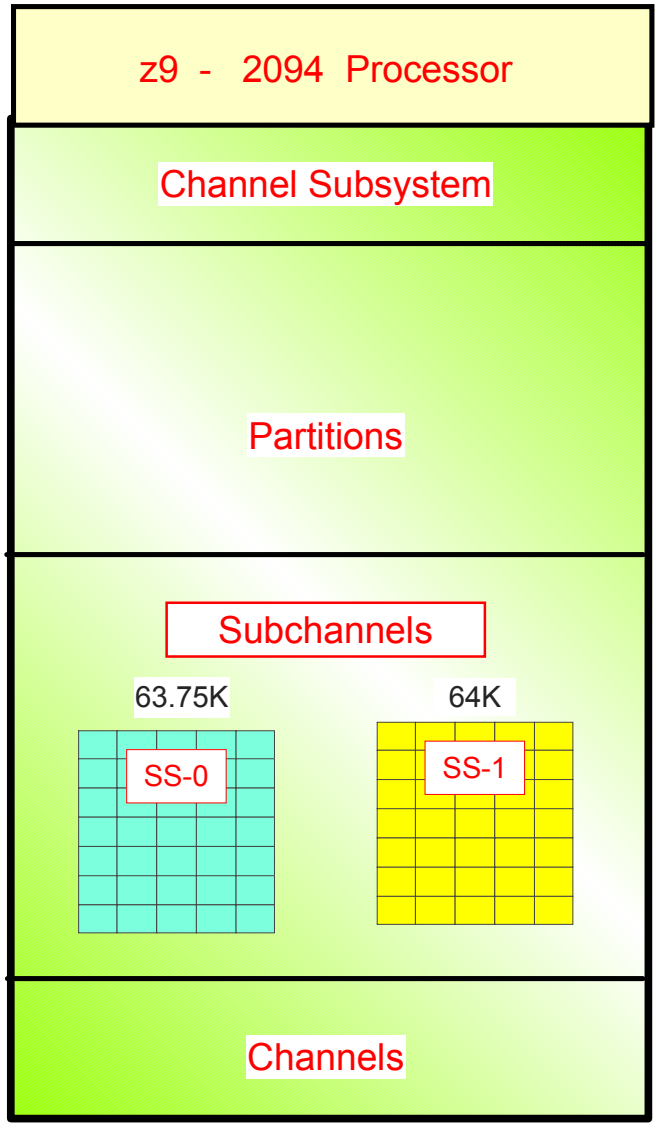
z9 - 2094
DASD Configurations
Increased to 127.75 Devices

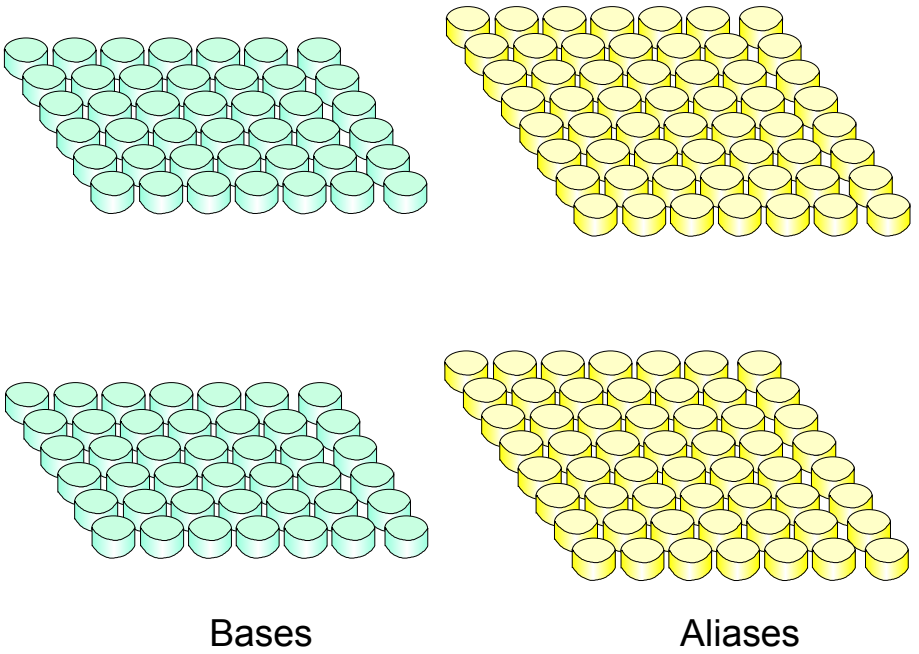


Bases

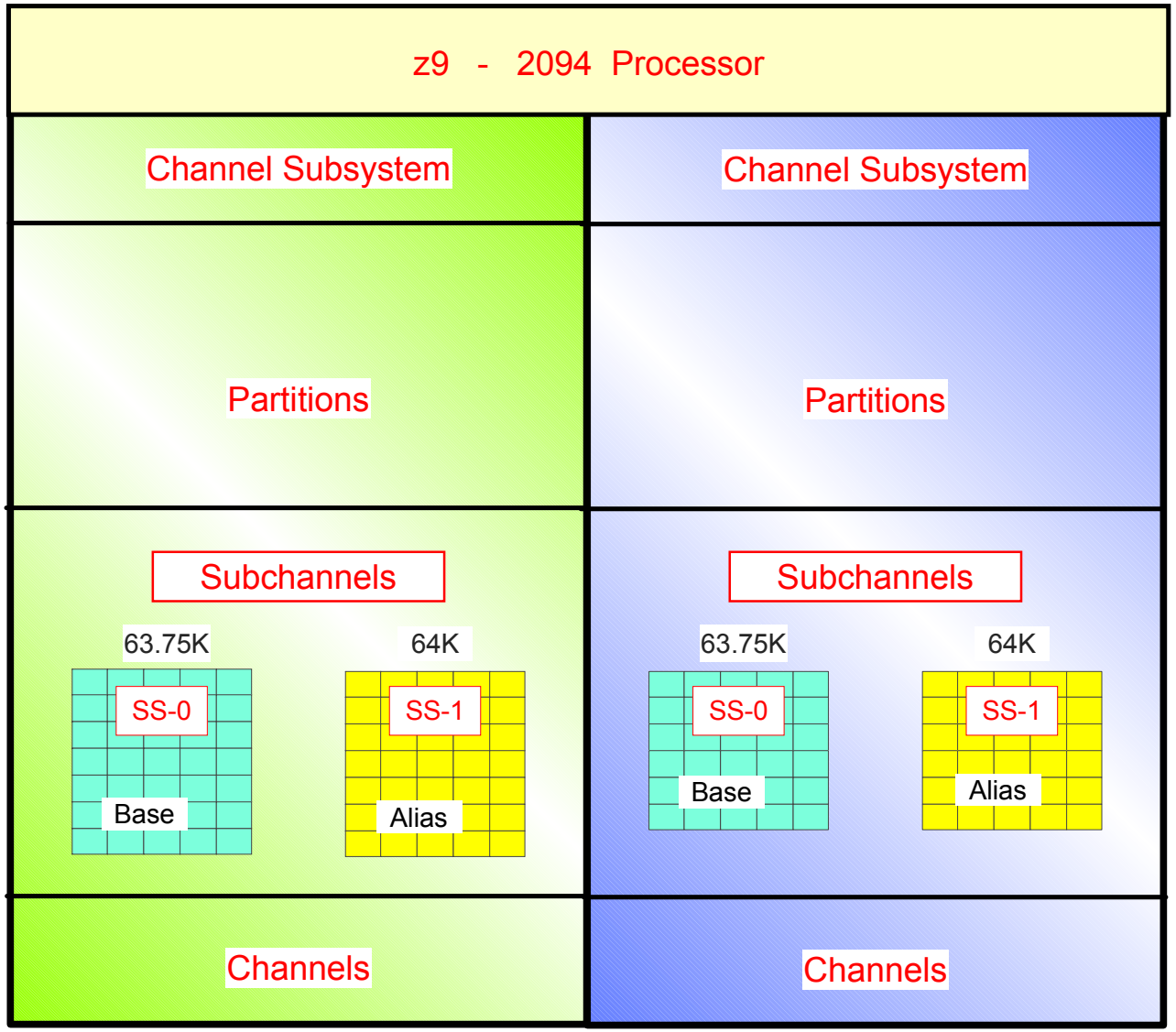
Aliases

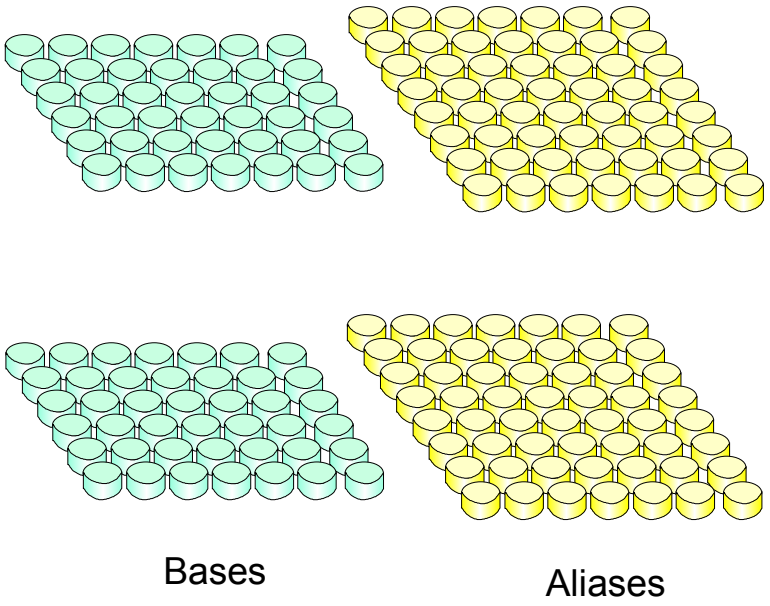
A 2094 Channel Subsystem can have two sets of Subchannels





Each 2094 Channel Subsystem can have two sets of Subchannels





Note:There really is up to 15 - 2x sets subchannels per CSS, one for each LPAR

- Large zSeries z/Architecture I/O Configurations
  - Design, Support, Operations, Monitoring, Logical and Physical Maintenance, is COMPLEX
- It requires knowledge of
  - I/O Configuration Design
  - I/O Configuration Definition support and usage of the definition tools
  - Characteristics, specification, addressing, usage performance information and working knowledge, of the zSeries
    - Processor
    - Channel subsystems
    - Logical partitions
    - Subchannels
    - Channels
    - Internal I/O flow and operation within the processor complex
    - I/O network topologies
    - I/O network addressing
    - I/O Control Units and Devices
- KNOWLEDGE AND EXPERIENCE IS THE KEY TO A SUCCESSFUL INSTALL

- Note:
- The previous page was an advice to you that this is an in-depth technical presentation on the end user EXTERNALS of I/O configuration definition support for the IBM zSeries processors, and problem determination for Alias not-operational conditions.

IBM System z9 109 - 2094 Subchannel Sets - Agenda

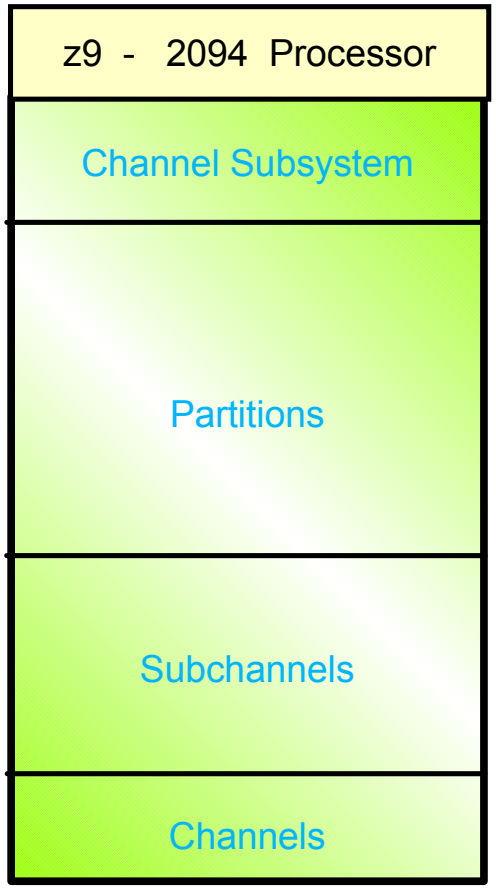
Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

- Agenda
  - zSeries Channel Subsystem introduction
  - What are subchannel Sets
  - How best to use Subchannel Sets
  - Definition
  - Migration
  - HCD
  - IOCP
  - z/OS system setup
  - IODF and IPL
  - Problem Determination

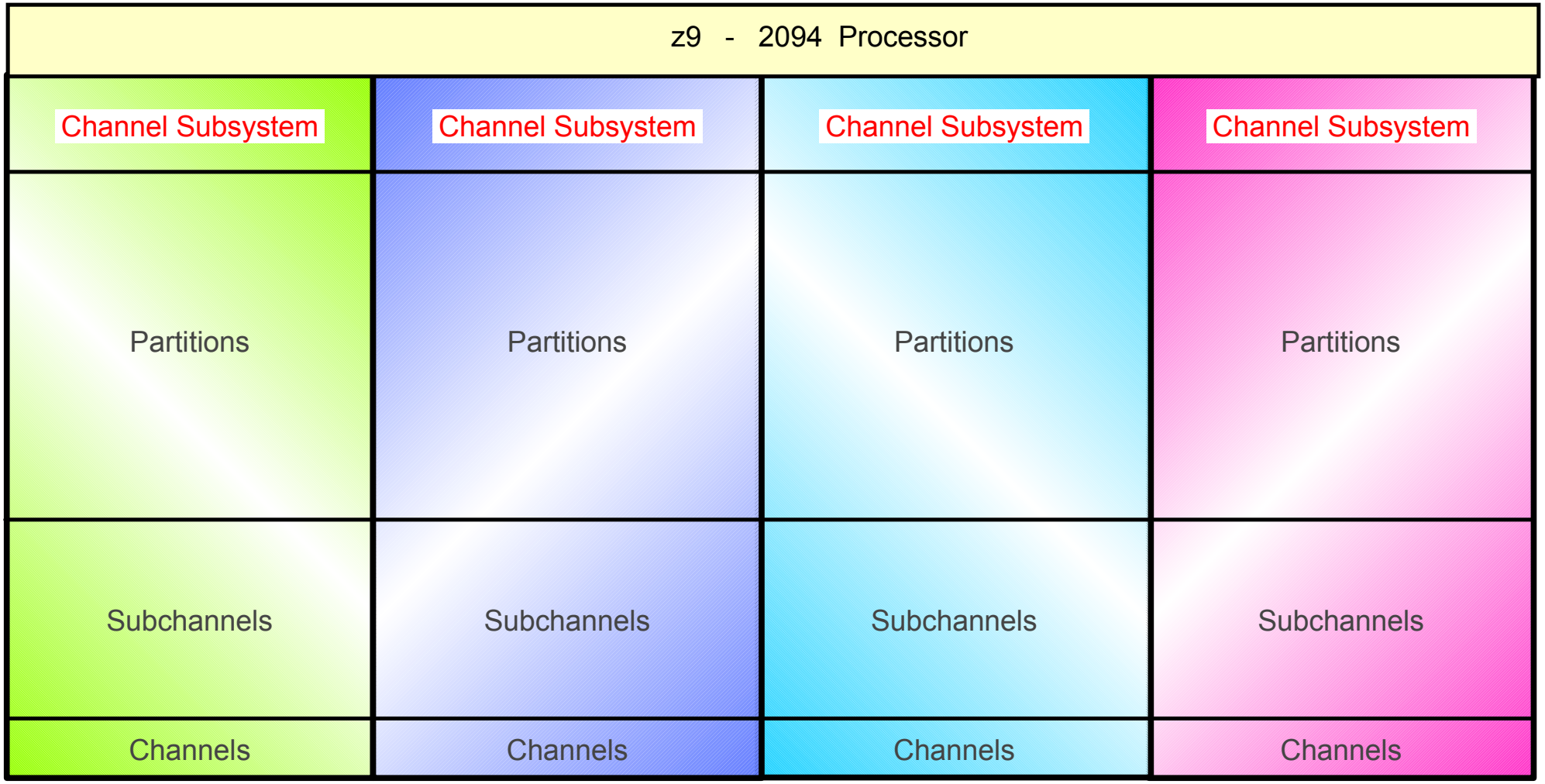
IBM System z9 109 - 2094
2094 I/O Channel Subsystem Characteristics and Support of Subchannel Sets

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

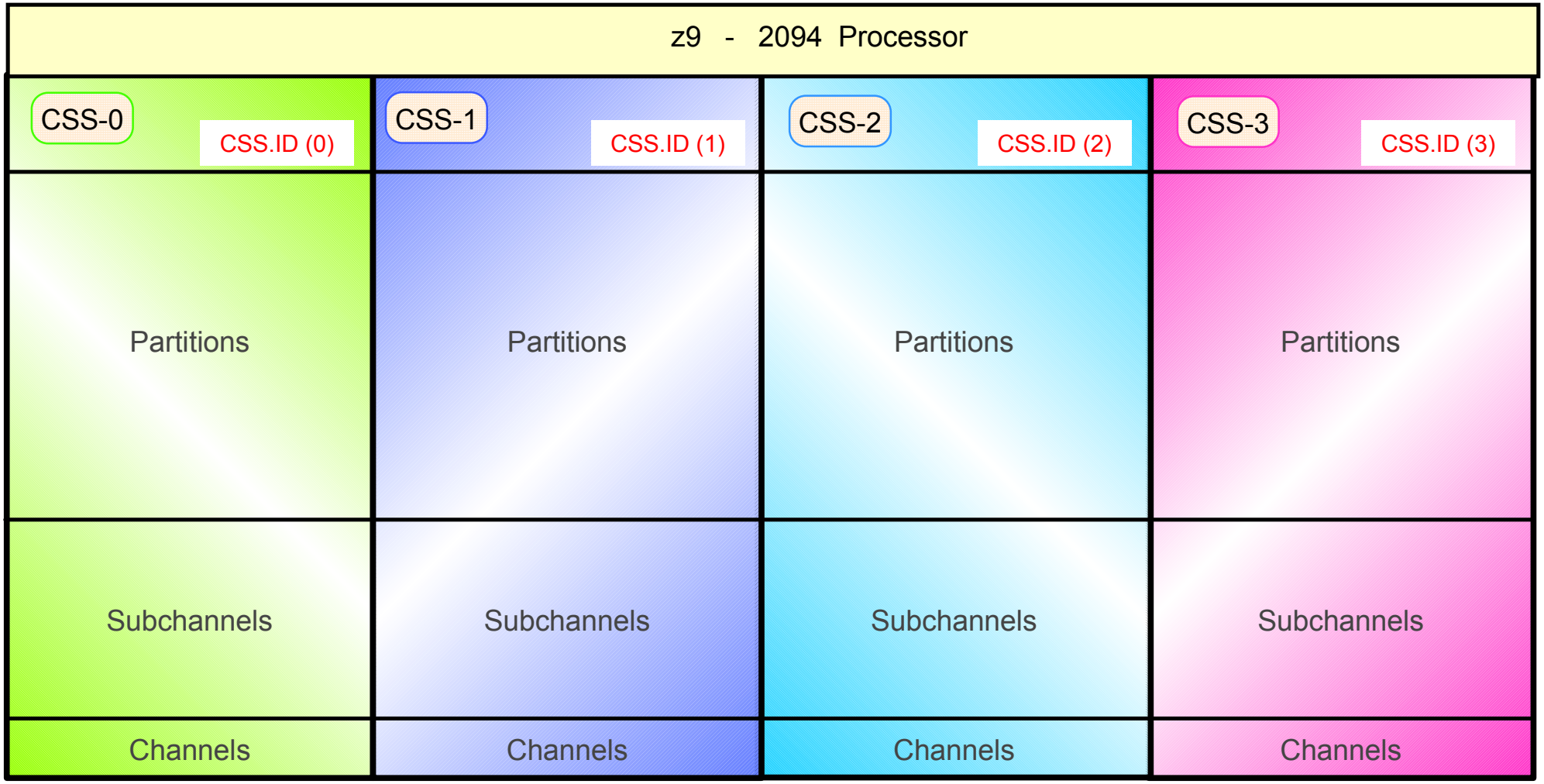
- 2094 supports Multiple Channel Subsystems (MCSS)
  - 1 to 4 Channel Subsystems (CSS)
  - Each CSS has a CSS.ID: 0, 1, 2, or 3
- 2094 supports Multiple Subchannel Sets (MSS)
  - 1 or 2 subchannel Sets per CSS
  - The two Subchannel Sets are referred to as SS0 and SS1 or SS-0 and SS-1
- Up to 15 Logical Partitions supported by each CSS
  - This includes the place holder logical partitions (LPname = *)
    - Place holder logical partitions (*) cannot be zXXX activated
  - Each zXXX activated logical partition has a:
    - MIF.ID - a unique value of x'1' though x'F' within a CSS
    - LP NAME - must be unique across all logical partition in the zXXX (see the IOCP documentation)
    - PARTITION.ID - a unique value of x'00' to x'3F' across all the zXXX logical partitions
- Each Logical Partition only uses I/O (Subchannels/Devices) defined to its host CSS / LP
  - Each CSS has its own sets of subchannels for each of its LPARs
    - From 1 up to 65280 subchannels for SS-0 (cannot dynamically change this value)
    - From 0 to 65535 subchannels for SS-1 (cannot dynamically increase / change)
- Each CSS supports up to 256 channels - 256 CHPIDs (x'00' to x'FF')
  - CHPID numbers cannot be duplicated within an CSS



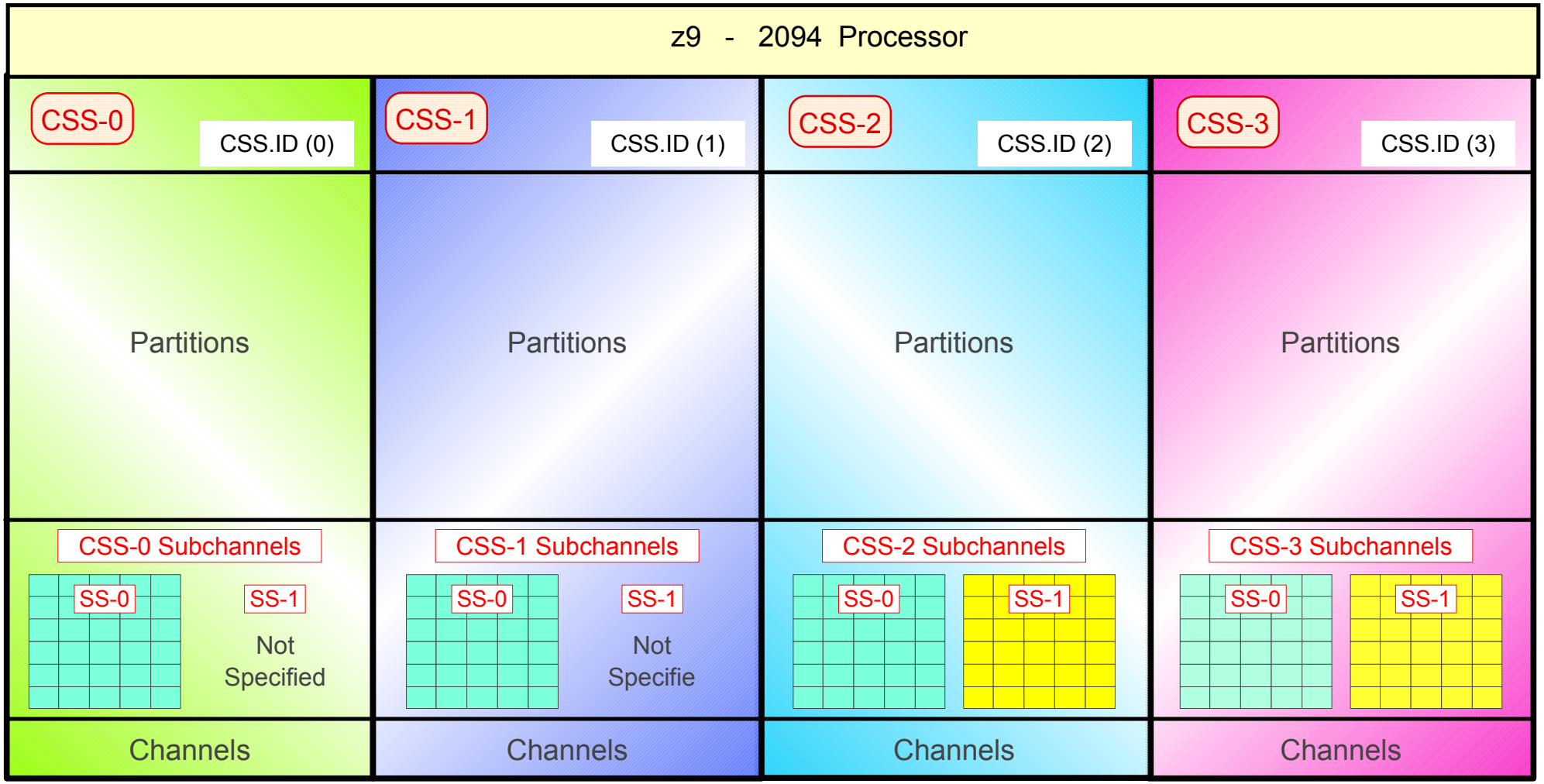
- I/O support on a z9 2094 Processor requires
  - Channel Subsystem
    - Controls queuing, de-queuing and priority management, and I/O identification of all I/O operations performed by any logical partitions in a CSS
  - Partition
    - Supports the running of a System Control Program, such as z/OS, and provides logical CPs, memory, Subchannels, and access to channels
  - Subchannels
    - A subchannel represents an I/O device to the hardware, is used by the SCP to pass an I/O request from the SCP to the channel subsystem
  - Channels
    - The communication path from the channel subsystem to the I/O network and the connected control units / devices



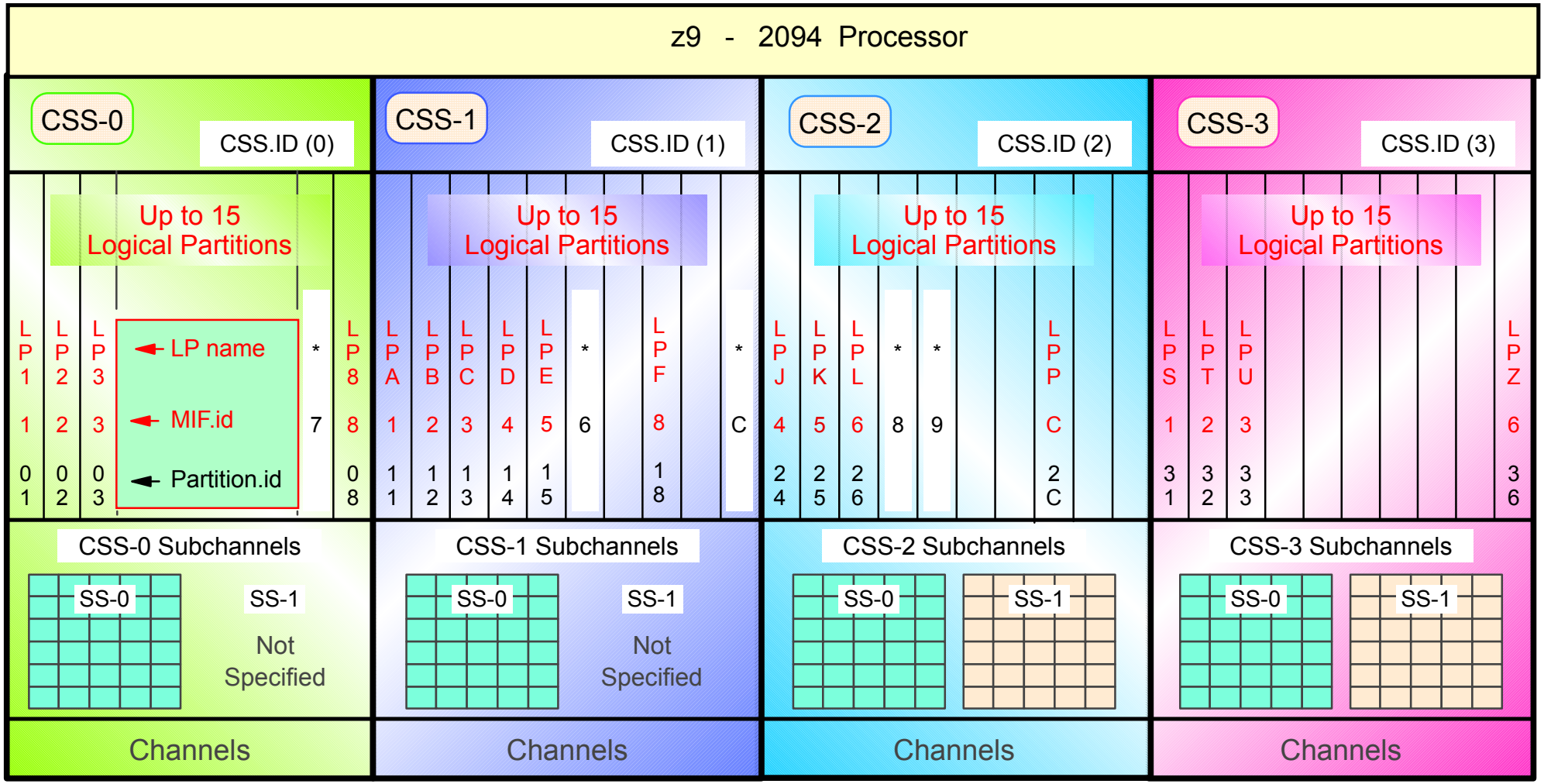
- The z9 - 2094 Processor supports 1 to 4 Channel Subsystems (CSS)



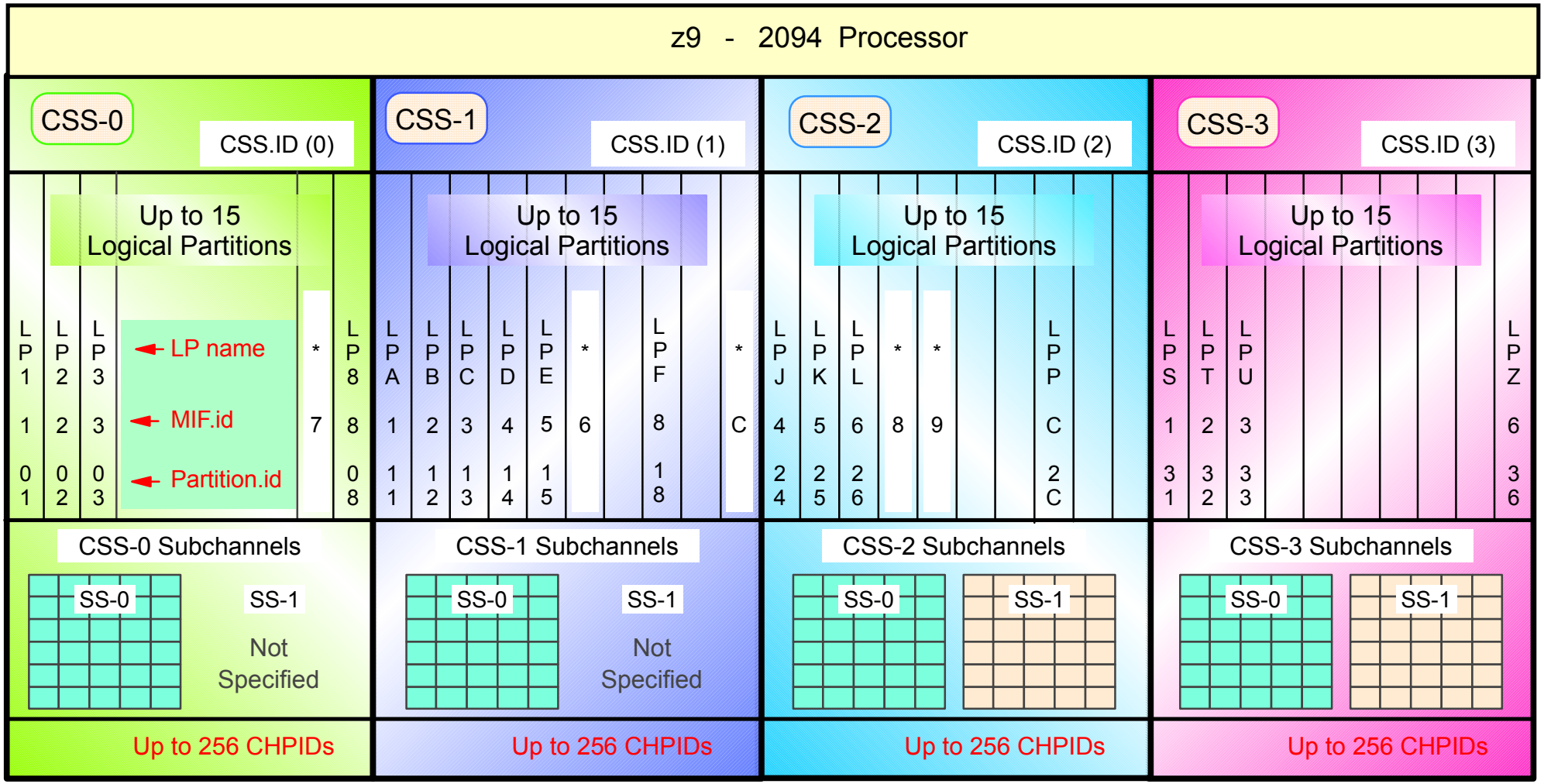
- The z9 - 2094 Processor supports 1 to 4 Channel Subsystems (CSS)
  - Each CSS has its own CSS.ID



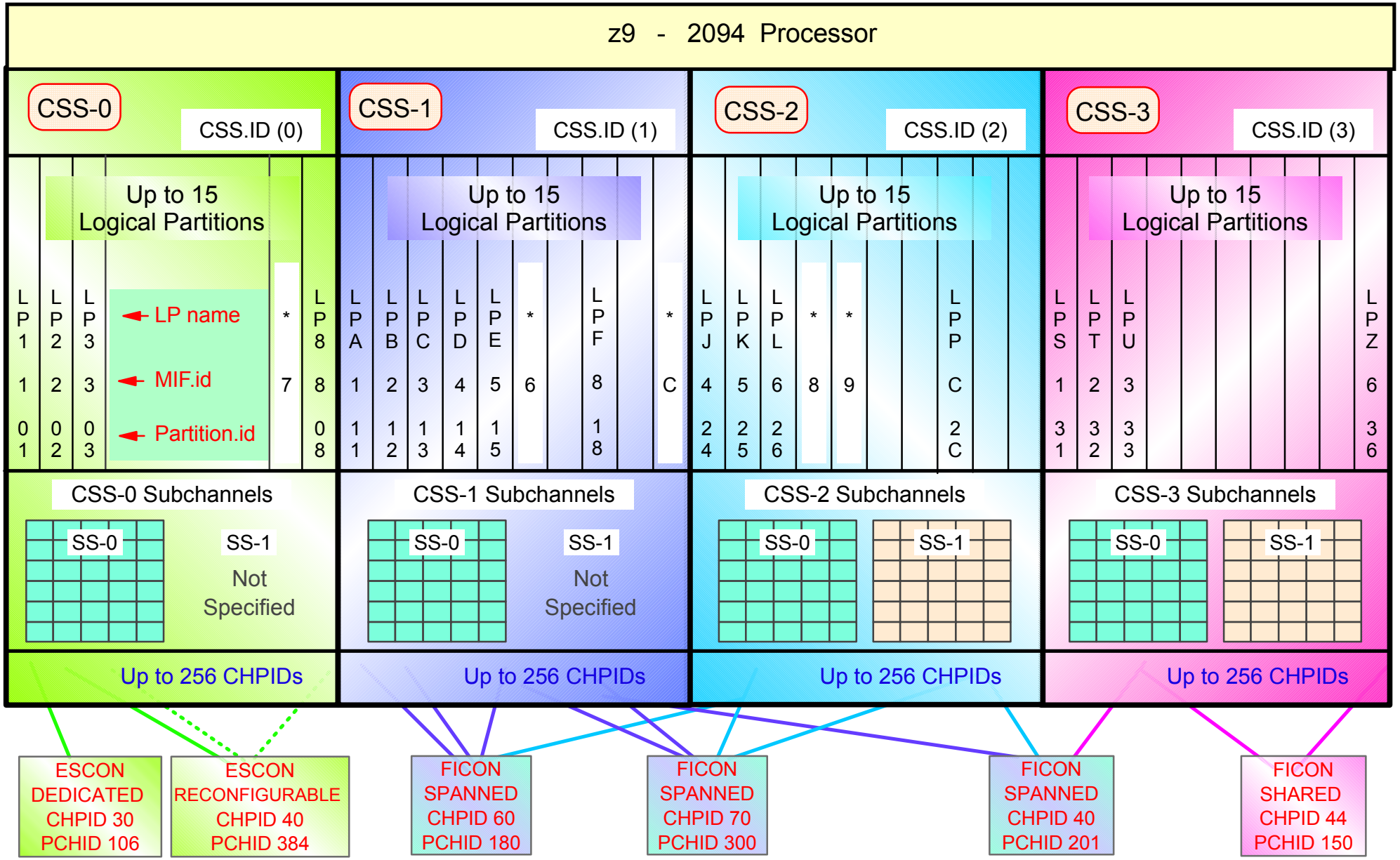
- The z9 supports 1 to 4 Channel Subsystems (CSS)
  - Each CSS has its own CSS.ID
  - Each CSS has its own set of SS0 subchannels and may have optionally specified SS1 subchannels for its CSS Logical Partitions. Adding SS1 subchannels at a later stage is disruptive (i.e. requires a Reset Profile Activation)
  - Each logical partition only uses I/O (Subchannels/Devices) defined to its host CSS



- The z9 supports 1 to 4 Channel Subsystems (CSS)
  - Each CSS has its own CSS.ID
  - Up to 15 Logical Partitions for a CSS with 60 LPARs maximum for the zXXX
  - This includes the place holder (reserved) logical partitions (*)
  - Each z9 activated logical partition has:
    - LP NAME - MIF.ID - PARTITION.ID (suggestion make the Partition.id the same as CSS.id + MIF.id)
    - Place holder (reserved) partitions (*) cannot be z9 activated
  - Each CSS has its own set of SS0 subchannels and optional SS1 subchannels for its Logical Partitions
  - Each logical partition only uses I/O (Subchannels/Devices) defined to its host CSS

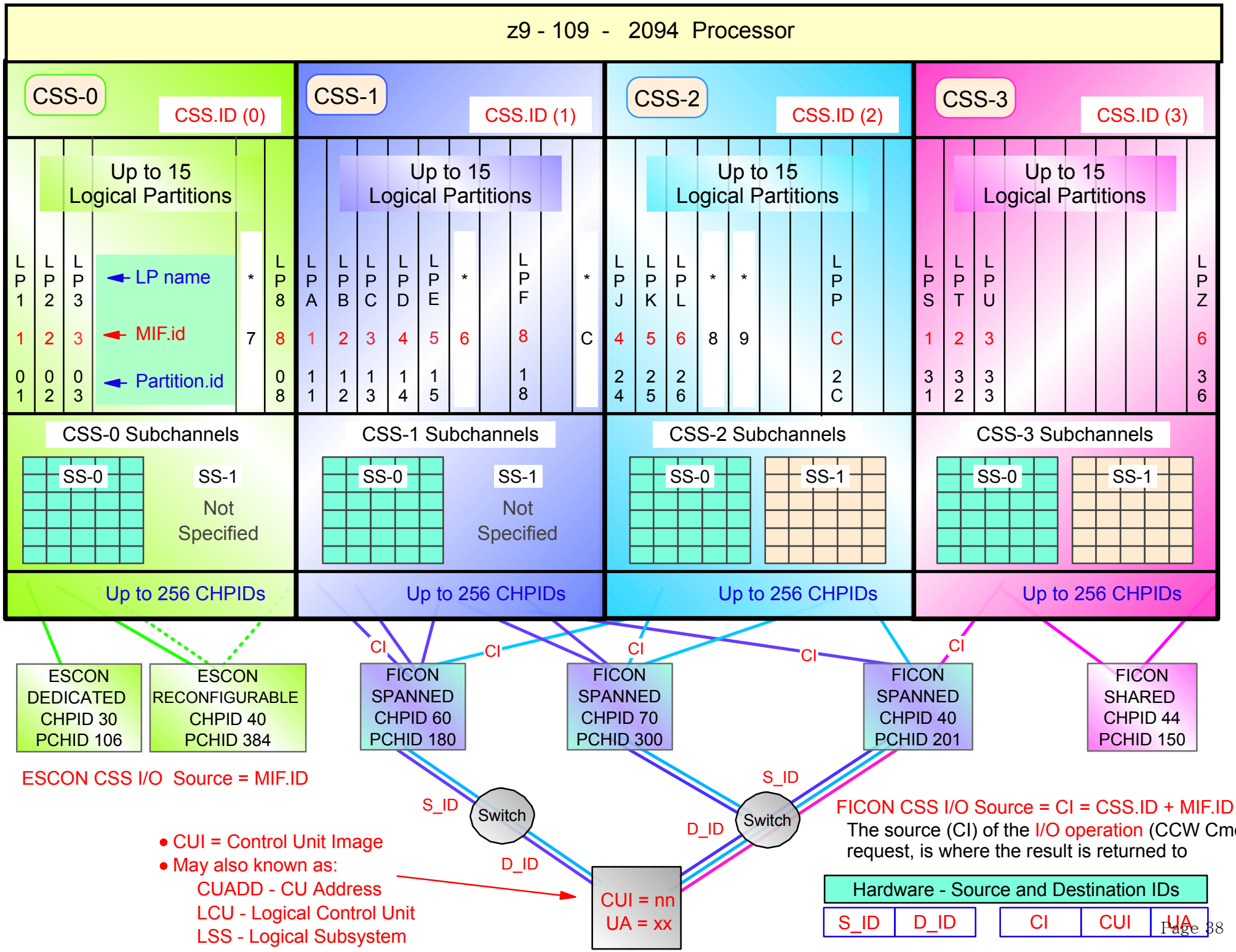


- The z9 supports 1 to 4 Channel Subsystems (CSS)
  - Each CSS has its own CSS.ID
  - Up to 15 Logical Partitions for a CSS with 60 LPARs maximum for the z9
  - This includes the new place holder logical partitions (*)
  - Each activated logical partition has:
    - LP NAME - MIF.ID - PARTITION.ID
    - Place holder partitions (*) cannot be z9 activated
  - Each CSS has its own set of SS0 subchannels and optional SS1 subchannels for its Logical Partitions
  - Each logical partition only uses I/O (Subchannels/Devices) defined to its host CSS
- Up to a maximum of 256 CHPIDs per CSS
- Up to 1024 channels in total for a z9

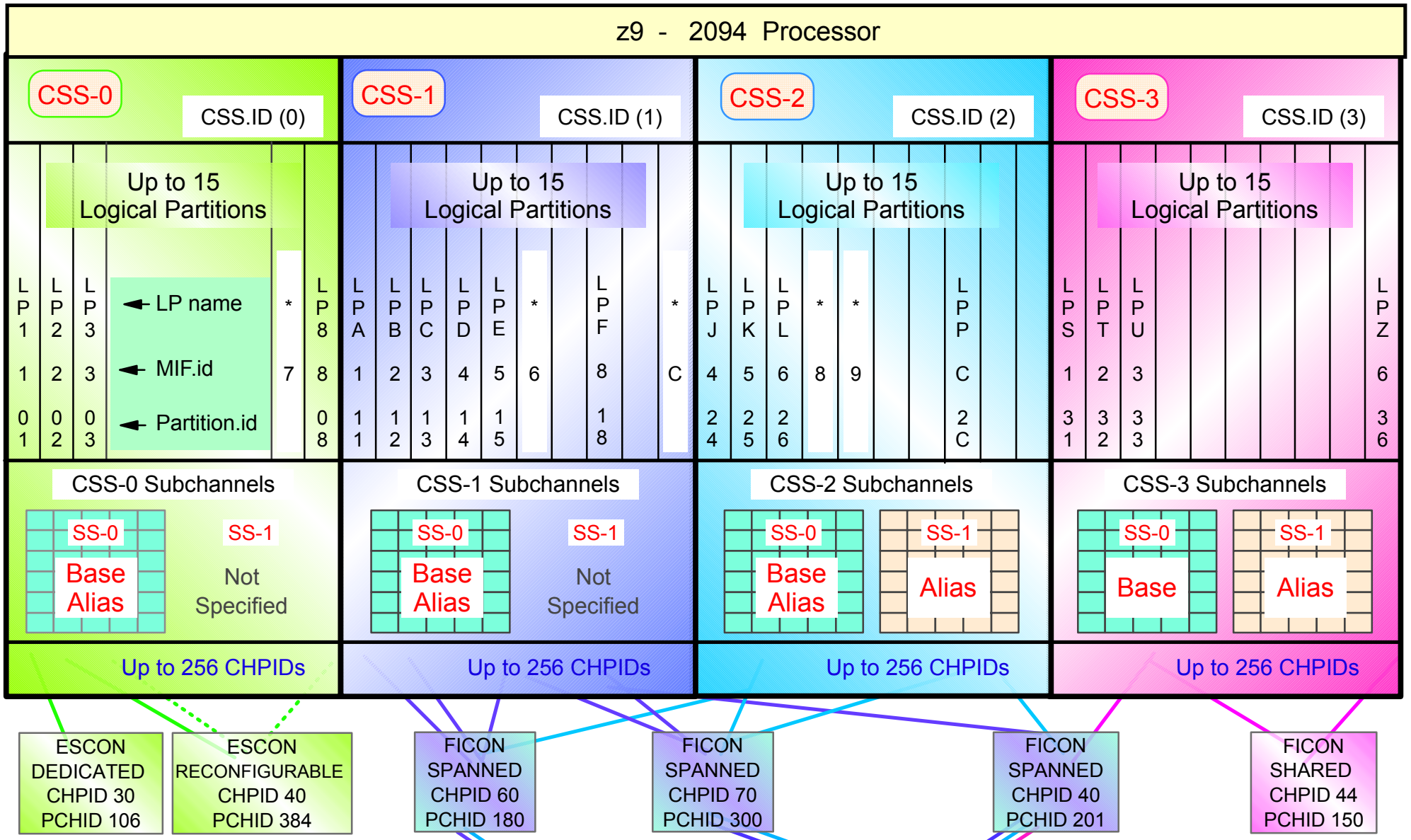


- Dedicated - Can only be accessed by one LP in the z9
- Reconfigurable - Accessed by one LP in the CSS, can be configured Offline to the LP, and then Online to another LP in the same CSS
- Shared - Can be accessed (be online) by one or more accessing LPs at the same time, all LPs must be in the same CSS
- Spanned - Can be accessed (be online) by one or more accessing LPs at the same time, the LPs can be in different CSSs
- Note - 1. Duplication of CHPID numbers in the same CSS (LCSS) is not allowed
- Note - 2: Place holder logical partitions (*) cannot be specified in a CHPID Access or Candidate list
- Note - 3. CHPID 40 in CSS 0 and CHPID 40 in CSS 1/2/3 are not the same channel, they have different PCHIDs - 384 and 201
- Note - 4. CHPID 70 in CSS 1 and CSS 2, are a the same channel, it is a spanned channel, with one PCHID value of 300

BM System z9 109 - 2094 - I/O system structure - Logical Path addressing



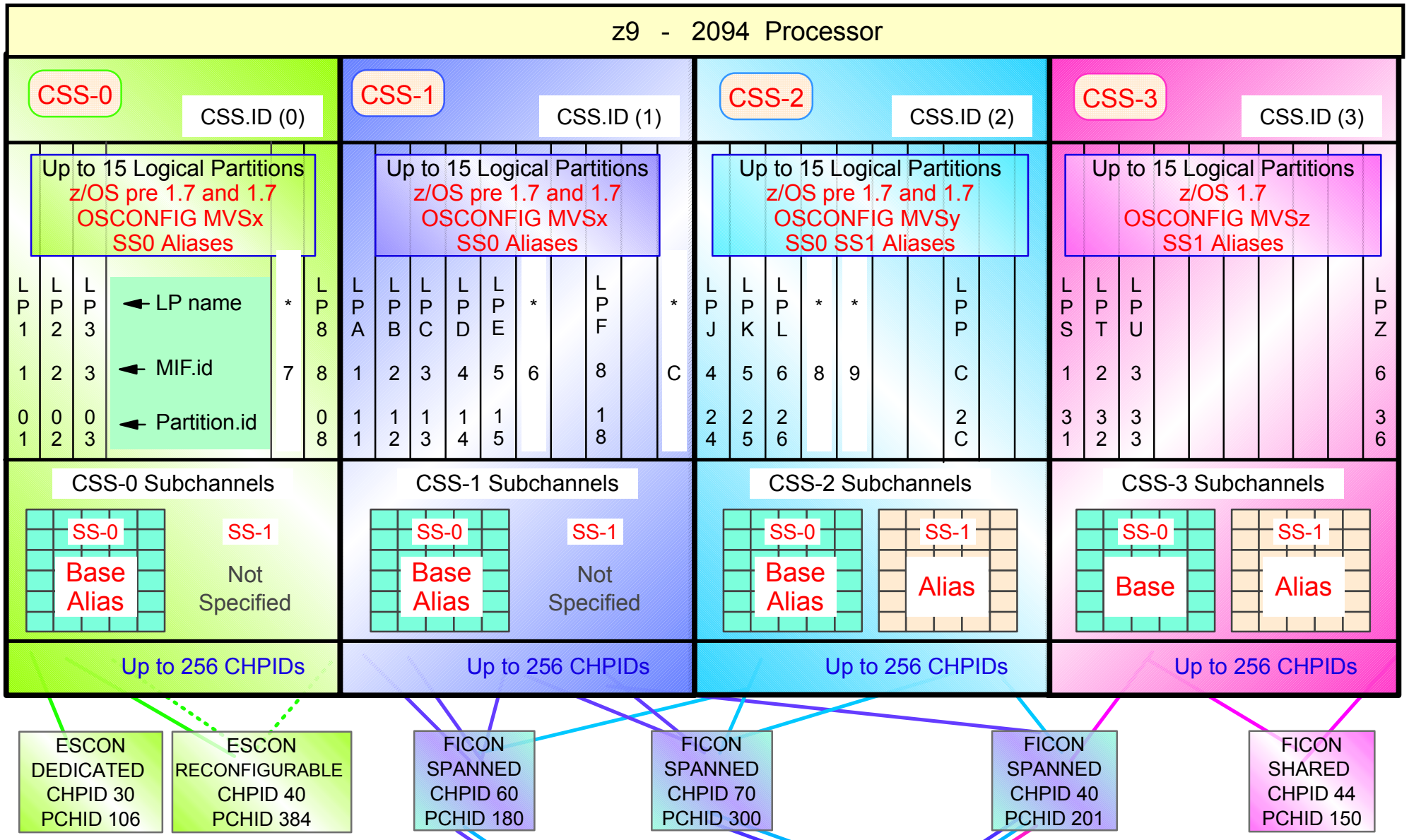
BM System z9 109 - 2094 - I/O system structure - Alias Devices



- Note: For any CSS a device can only be defined to one subchannel set within a CSS. This applies to both Base and Alias devices
- For z/OS all Base devices are defined in SS0
- An Alias device may be defined in SS0 for one CSS and SS1 for another CSS
- For a given CSS some alias devices (different) can be in SS0 and some can be in SS1

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

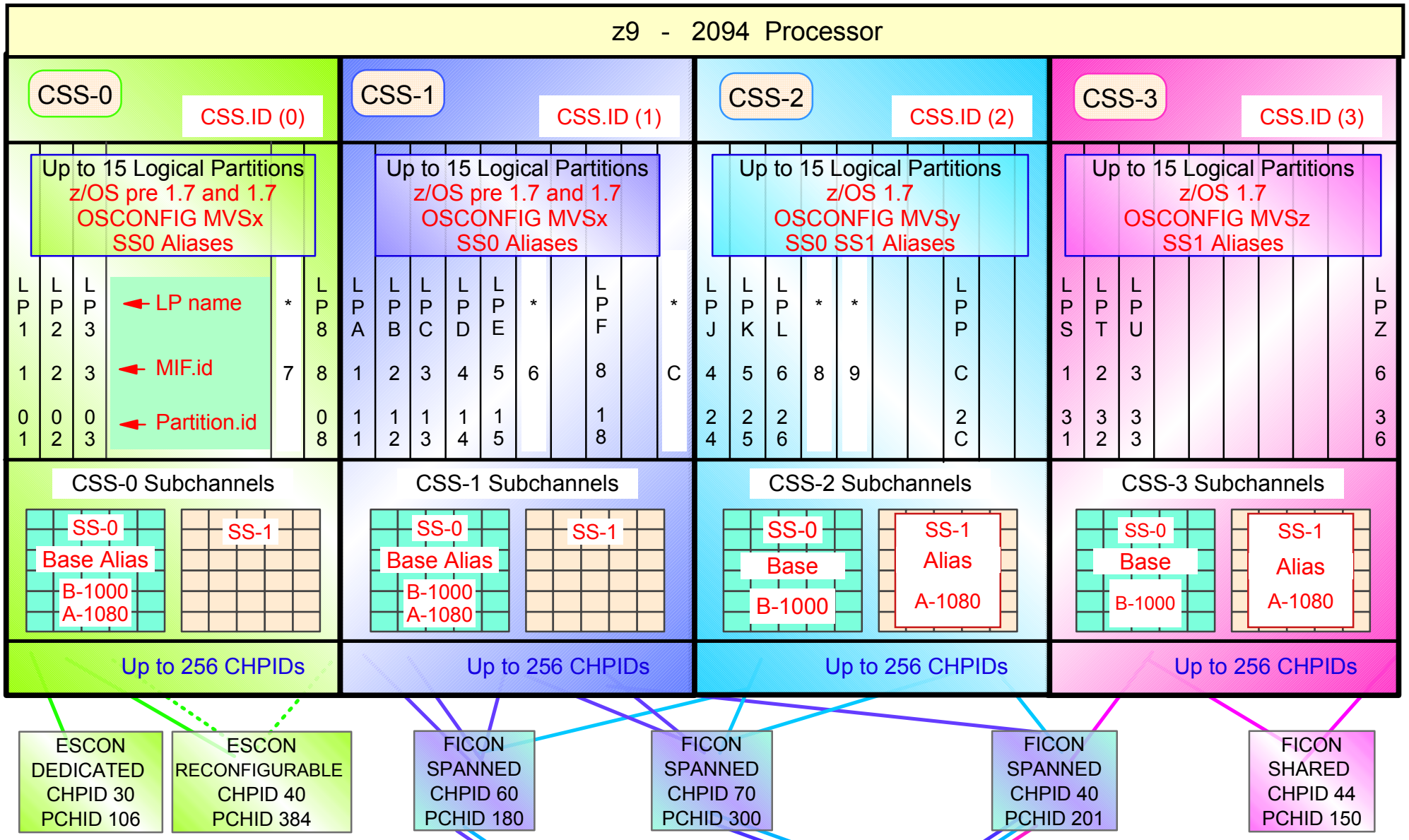
BM System z9 109 - 2094 - I/O system structure - z/OS pre 1.7 and z/OS 1.7



- Note: For any CSS a device can only be defined to one subchannel set. This applies to both Base and ALIAS devices
- For z/OS 1.7 all Base devices are defined in SS0 and an Alias may be defined in SS0 or SS1. All alias can be defined in SS0 or SS1 or some in SS0 and some in SS1
- z/OS pre 1.7 cannot access Alias devices defined in SS1

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

BM System z9 109 - 2094 - I/O system structure - Sysplex Environment



CU 1000 - CUADD 00 Base 1000 - 107F UA 00
CU 1000 - CUADD 00 Alias 1080 - 10FF UA 80

CU 1100 - CUADD 01 Base 1100 - 107F UA 00
CU 1100 - CUADD 01 Alias 1180 - 10FF UA 80

- Note: z/OS systems in the same 2094, or the same sysplex, may each access the same alias device using a different z/Architecture device number. However the CUI and UA for the Alias device is the same for all systems that access the device

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

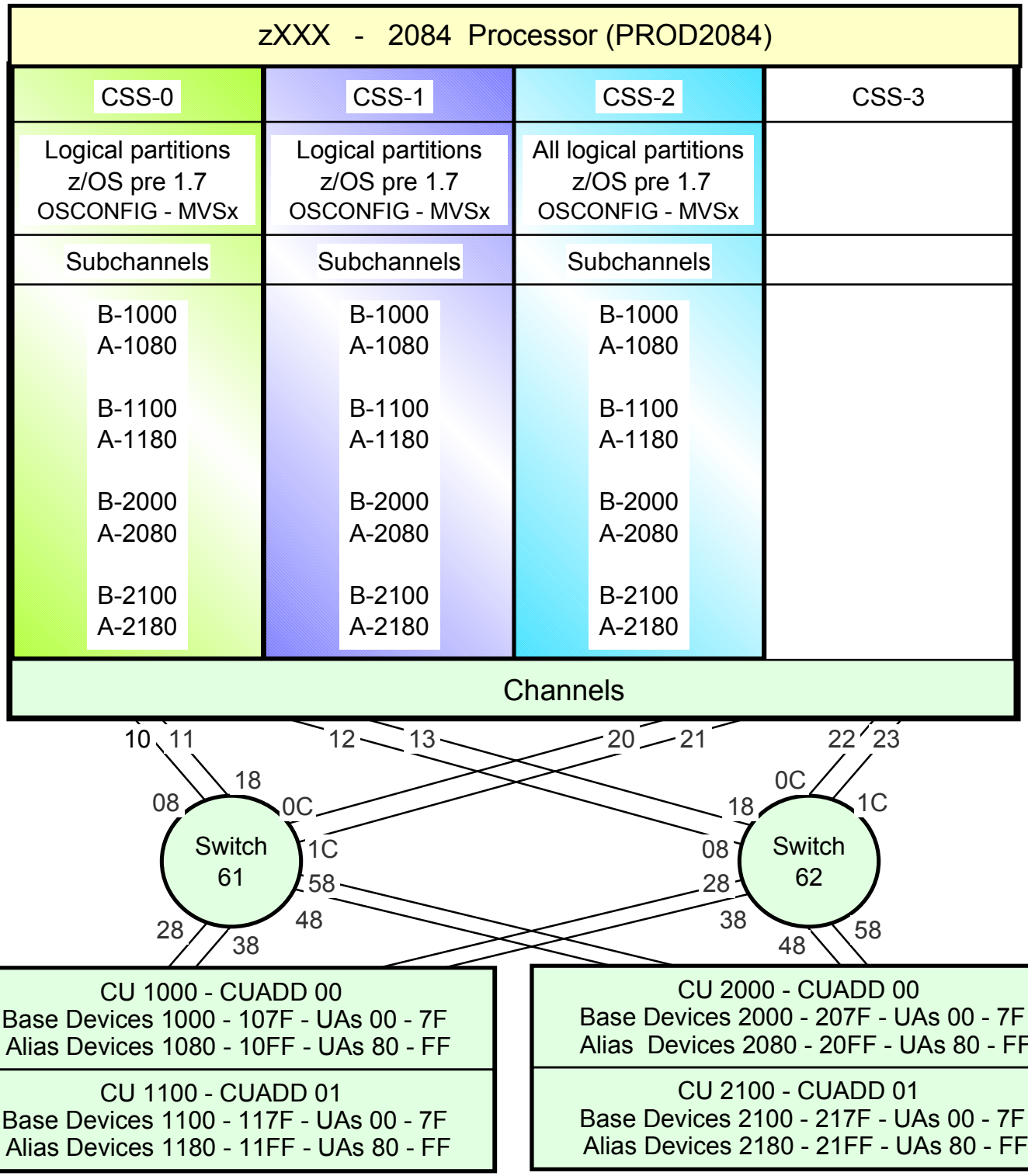
IBM System z9 109 - 2094

I/O Configuration Support

Subchannel Sets

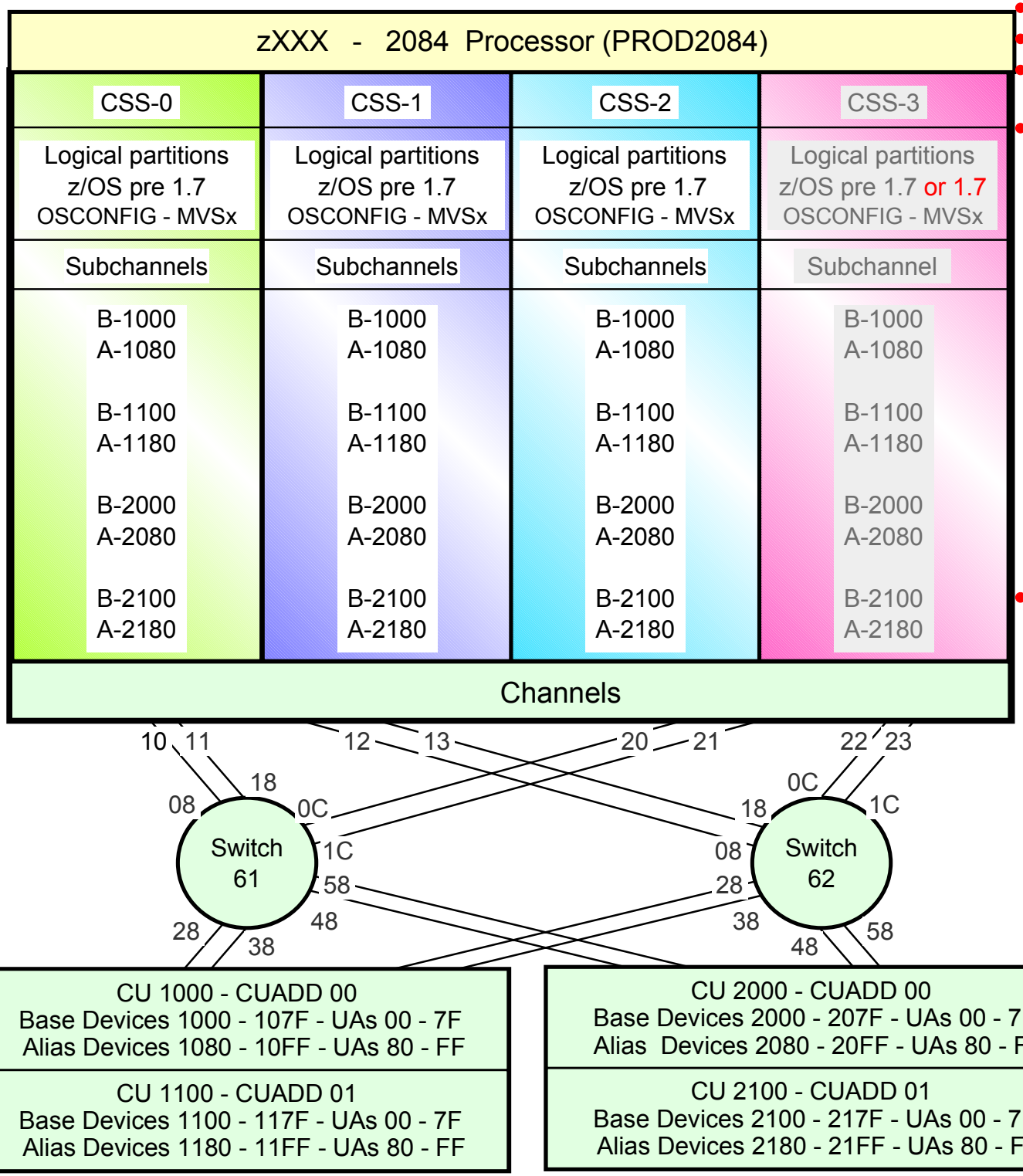
Alias Device Support

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005



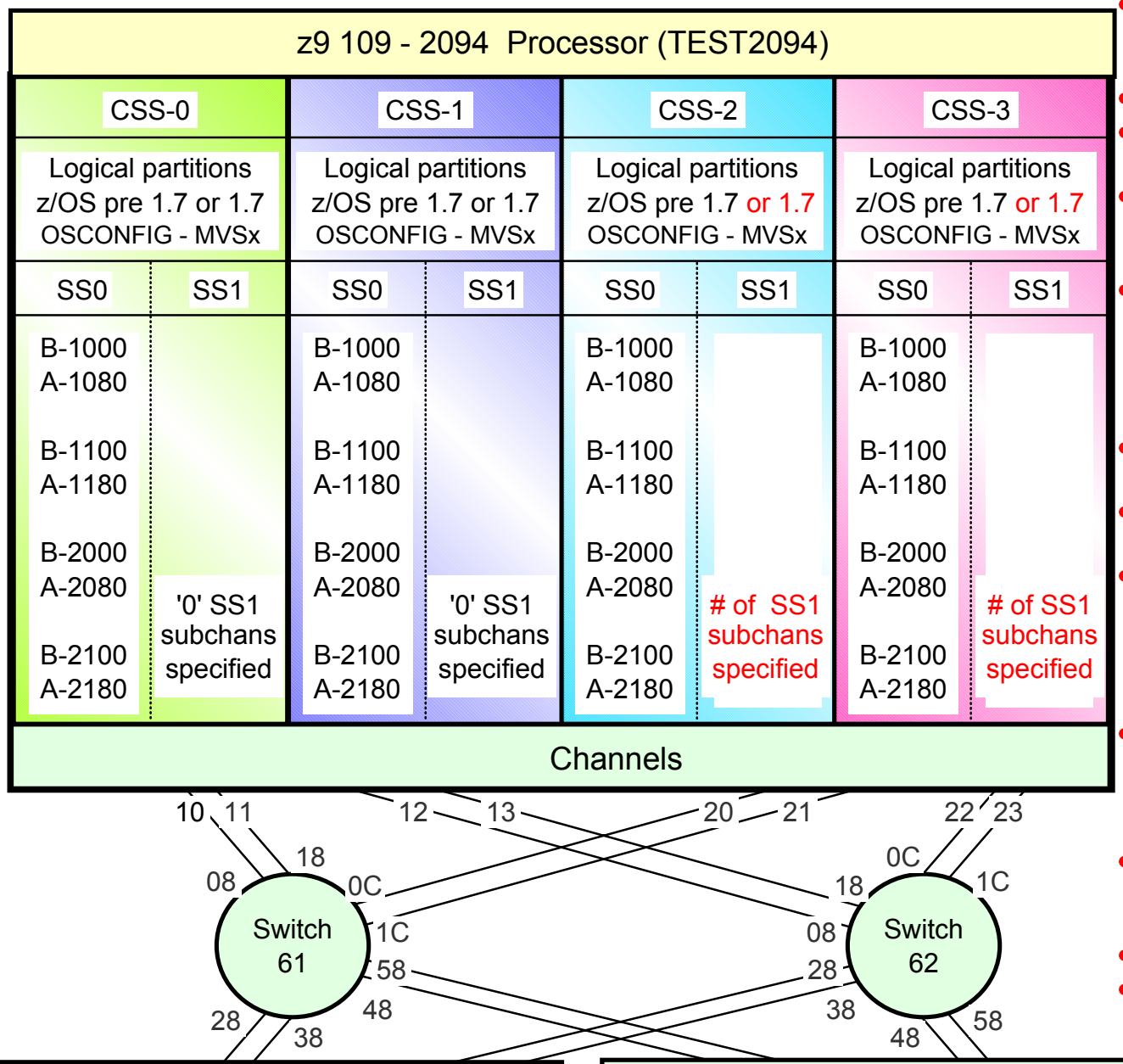
- All Bases are defined to CSS 0, 1, 2
- All Aliases are defined to CSS 0, 1, 2
- z/OS 1.7 has been installed and is running in at least one logical partition in any of the CSSs
- For this example either CSS3 is not defined in the 2084 or if defined a z/OS running in a CSS3 logical partitions will be ungraded to z/OS 1.7 prior to a 2084 to 2094 upgrade, or when the 2084 is MES upgraded to a 2094. This is to allow the z/OS 1.7 system to exploit the movement of Alias devices on the 2094 from SS0 to a SS1 in the 2094 CSS-3 and freeing up subchannels in the 2094 CCS-3 SS0 for the definition of additional Base devices in the 2094 CSS-3 SS0.
- Note: Once the Alias devices are defined in SS1 in a 2094 CSS all z/OSs running in logical partitions in that 2094 CSS must be at z/OS 1.7 or later to be able to access the Alias subchannels in that 2094 CSSs SS1 (covered later in this presentation).
- Only one OSCONFIG - MVSx

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS



- All Bases are defined to CSS 0, 1, 2
- All Aliases are defined to CSS 0, 1, 2
- z/OS 1.7 has been installed and is running in at least one logical partition in any of the CSSs
- For this example either CSS3 is not defined in the 2084 or if defined a z/OS running in a CSS3 logical partitions will be ungraded to z/OS 1.7 prior to a 2084 to 2094 upgrade, or when the 2084 is MES upgraded to a 2094. This is to allow the z/OS 1.7 system to exploit the movement of Alias devices on the 2094 from SS0 to a SS1 in the 2094 CSS-3 and freeing up subchannels in the 2094 CCS-3 SS0 for the definition of additional Base devices in the 2094 CSS-3 SS0.
  - Note: Once the Alias devices are defined in SS1 in a 2094 CSS all z/OSs running in logical partitions in that 2094 CSS must be at z/OS 1.7 or later to be able to access the Alias subchannels in that 2094 CSSs SS1 (covered later in this presentation).
- Once z/OS 1.7 is installed.
  - Upgrade the 2084 definition to a 2094 or define from scratch the 2094 (include SS1)
  - Proc.id = TEST2094
  - No change to OSCONFIG MVSx
  - Map 2094 PCHIDs to 2094 CHPIDs (CMT)
  - Build a new Production IODF
  - Write a 2094 IOCDS, to the 2084 or 2094
  - Customize a 2094 Reset Profile
  - Reset Profile Activate the 2094
  - IPL z/OS 1.7 in at least one 2094 Logical Partition. z/OS pre1.7 may be IPL'd in other logical partitions
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

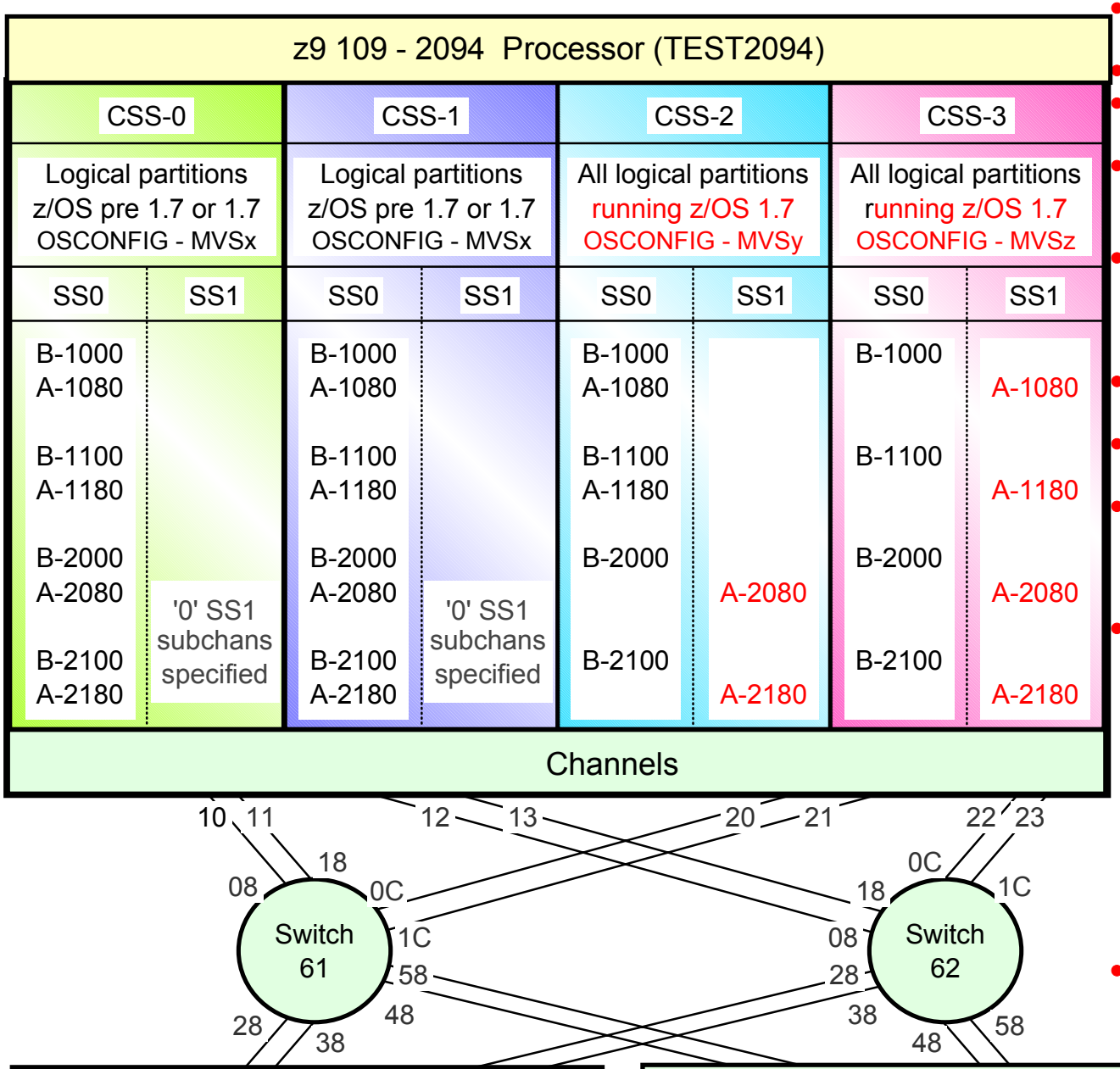
BM System z9 109 - 2094 - Configuration Support (2084 I/O Configuration migrated to a 2094)



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 instead of SS0 (see later)
- This allows all the subchannels in SS0 to be used in support of additional Base DASD devices and other devices (non-DASD)
- z/OS 1.7 will support Alias devices defined in either SS0 or SS1
  - Note: a CSS alias device (CI - D_ID - CUI - UA) can only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports snd uses alias devices that are defined in SS0
- An Alias device can be defined in SS0 in one CSS and SS1 in a different CSS
- This example shows Alias devices defined in SS0 in all of the CSSs. Either z/OS pre 1.7 or z/OS 1.7 may be used in any partition in any CSS.
  - At least one 2094 partition MUST have z/OS 1.7 IPL'd for dynamic I/O changes
- Note: This MCSS/MSS configuration only requires one Processor definition (PROC.id) and equires only one OSCONFIG definition
  - OSCONFIG - MVSx
- There is no Base device relief, in this example in SS0 as all Alias devices are still defined in SS0 in each of the CSSs
- CSS 0/1 have no SS1 subchannels defined
- CSS 2/3 have SS1 subchannels space defined, and therefore the alias devices in CSS2/3 SS0 may be dynamically moved to SS1

- Note: For this example each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

BM System z9 109 - 2094 - Configuration Support - Alias Support in CSS2 SS1 and CSS3 SS1)

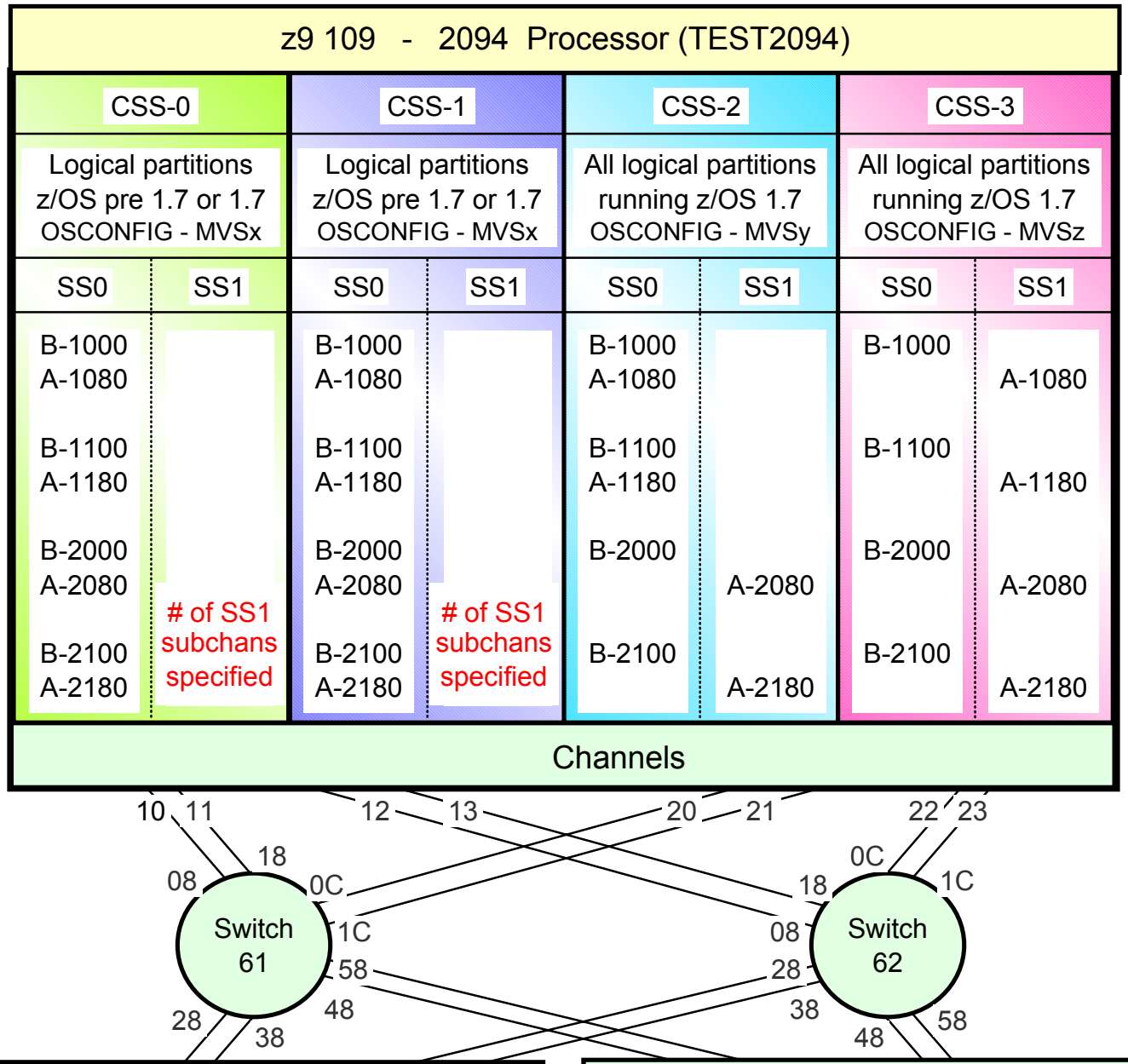


- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 subchannels instead of SS0 subchannels
- This allows all the subchannels in SS0 to be used in support of additional Base DASD devices and other devices (non-DASD)
- z/OS 1.7 will support Alias devices defined in either SS0 subchannels or SS1 subchannels
  - Note an alias device can only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports alias devices that are defined in SS0 subchannels
- An Alias devices can be defined in SS0 subchannels in one CSS and SS1 subchannels in another CSS
- This example shows Alias devices defined in SS0 for CSS0 and CSS1, and in SS1 for CSS2 and CSS3. Therefore z/OS pre 1.7 systems cannot run in CSS2 or CSS3 *& still access all the alias devices*
- Note: This configuration definition will require one Processor definition (PROC.id) and three OSCONFIG definitions (MVSx, MVSy, MVSz)
  - CSS0/1 z/OS pre 1.7 OSCONFIG - MVSx
  - CSS-2 z/OS 1.7 OSCONFIG - MVSy
  - CSS-3 z/OS 1.7 OSCONFIG - MVSz
  - MVSx supports Aliases only in SS0
  - MVSy supports SS0 A-1080 and A-1180
  - MVSy supports SS1 A-2080 and A-2180
  - MVSz supports SS1 A-1080 and A-1180
  - MVSz supports SS1 A-2080 and A-2180
- This configuration definition approach can be used when migrating from z/OS pre 1.7 to z/OS 1.7 for partitions in CSS-0,1,2

CU 1000 - CUADD 00 Base Devices 1000 - 107F - UAs 00 - 7F Alias Devices 1080 - 10FF - UAs 80 - FF	CU 2000 - CUADD 00 Base Devices 2000 - 207F - UAs 00 - 7F Alias Devices 2080 - 20FF - UAs 80 - FF
CU 1100 - CUADD 01 Base Devices 1100 - 117F - UAs 00 - 7F Alias Devices 1180 - 11FF - UAs 80 - FF	CU 2100 - CUADD 01 Base Devices 2100 - 217F - UAs 00 - 7F Alias Devices 2180 - 21FF - UAs 80 - FF

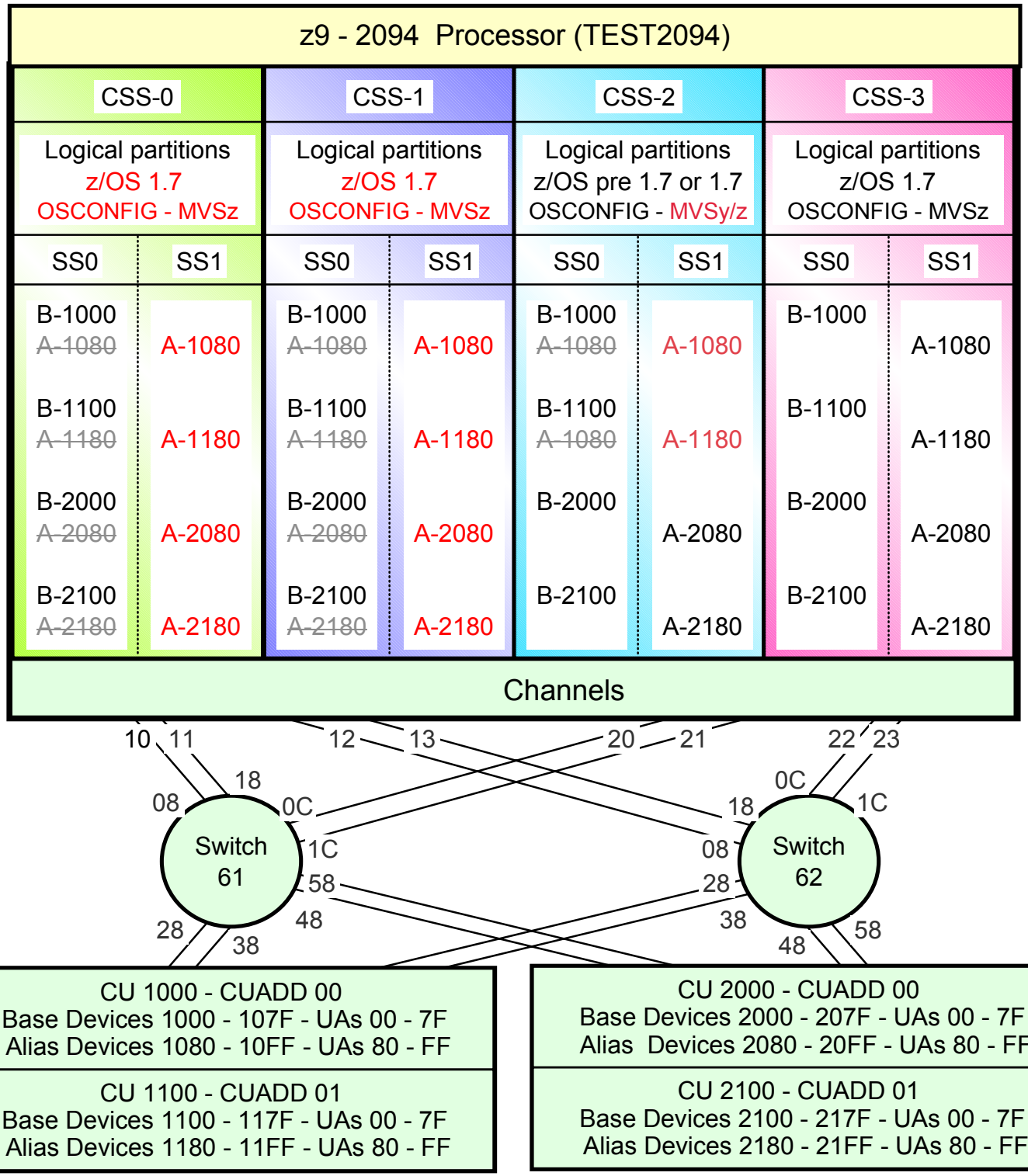
- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

zSeries BM System z9 109 - 2094 - Configuration Support - POR to provide SS1 Subchannels in CSS0 and CSS1



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 an alias device may be placed in SS0 or SS1, instead of only SS0
- This allows all the subchannels in SS0 to be used in support of additional Base DASD devices and other devices (non-DASD)
- z/OS 1.7 will support Alias devices defined in either SS0 or SS1 Alias
  - Note an alias device can only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports alias devices that are defined in SS0
- An Alias devices can be defined in SS0 in one CSS and SS1 in another CSS
- This example shows that:
  - A quantity of SS1 subchannels have been specified in the work IODF for CSS0 and CSS1
  - A production IODF has been built
  - An IOCDS has been written
  - Activate the processor (Reset Profile Activation) using the new IOCDS
  - IPL all the required logical partitions
- This configuration definition approach can be used prior to migrating from z/OS pre 1.7 to z/OS 1.7 for partitions in CSS-0,1,2

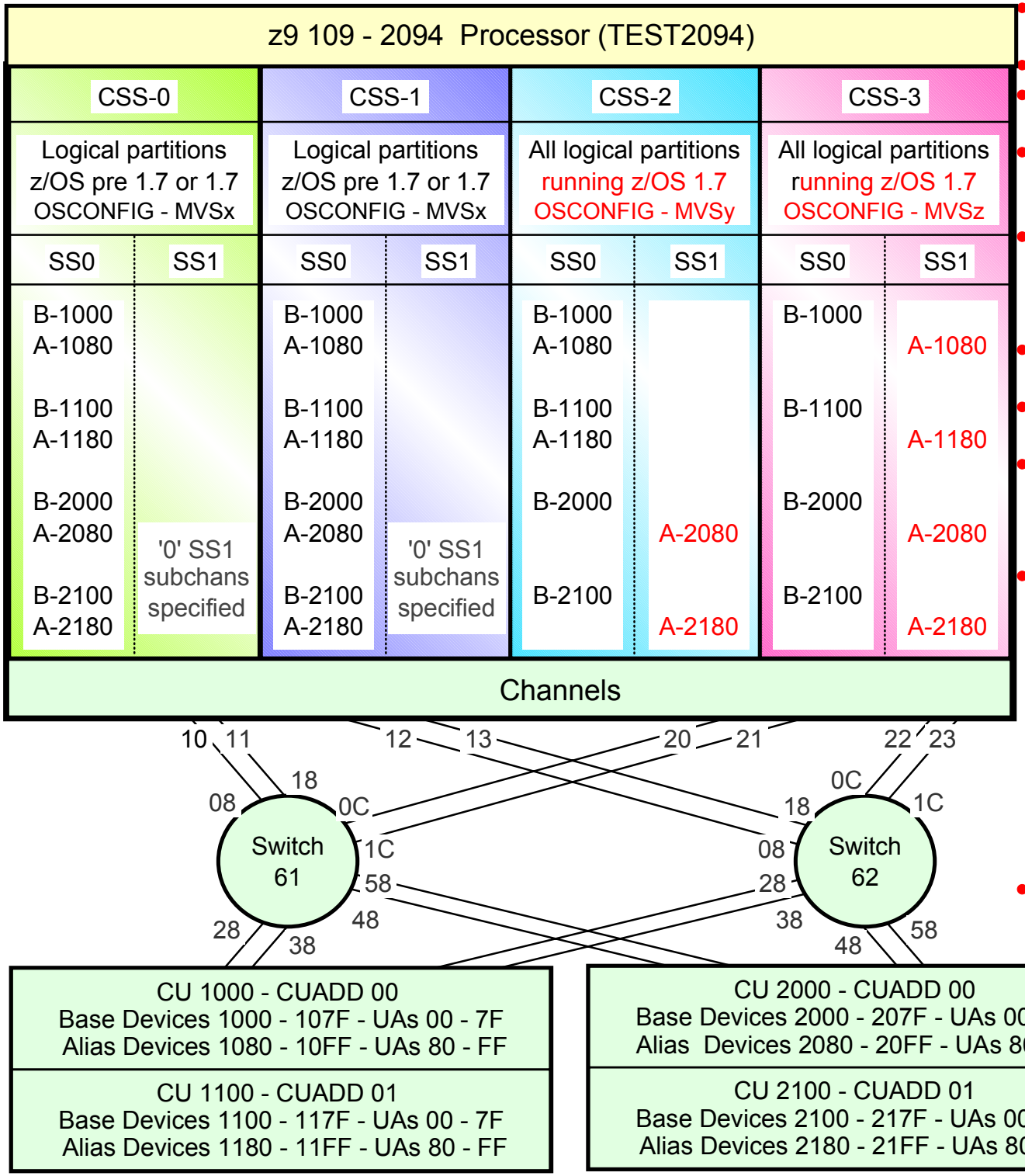
- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 instead of SS0
- This allows all the subchannels in SS0 to be used in support of additional Base DASD devices and other devices (non-DASD)
- z/OS 1.7 will support Alias devices defined in either SS0 or SS1 Alias
  - Note an alias device can only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports alias devices that are defined in SS0
- An Alias devices can be defined in SS0 in one CSS and SS1 in another CSS
- This example shows some or all the Alias devices defined in SS1 for all the CSSs. Therefore only z/OS 1.7 systems can be used to access the alias devices
- Note: This configuration will require one Processor definition (PROC.id) and may require only one OSCONFIG definition
  - z/OS 1.7
    - OSCONFIG - MVSz
- The maximum opportunity of Base device relief in each CSS's SS0 occurs when all Alias devices are defined in SS1. **But it means that all z/OSs are at z/OS 1.7**.

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

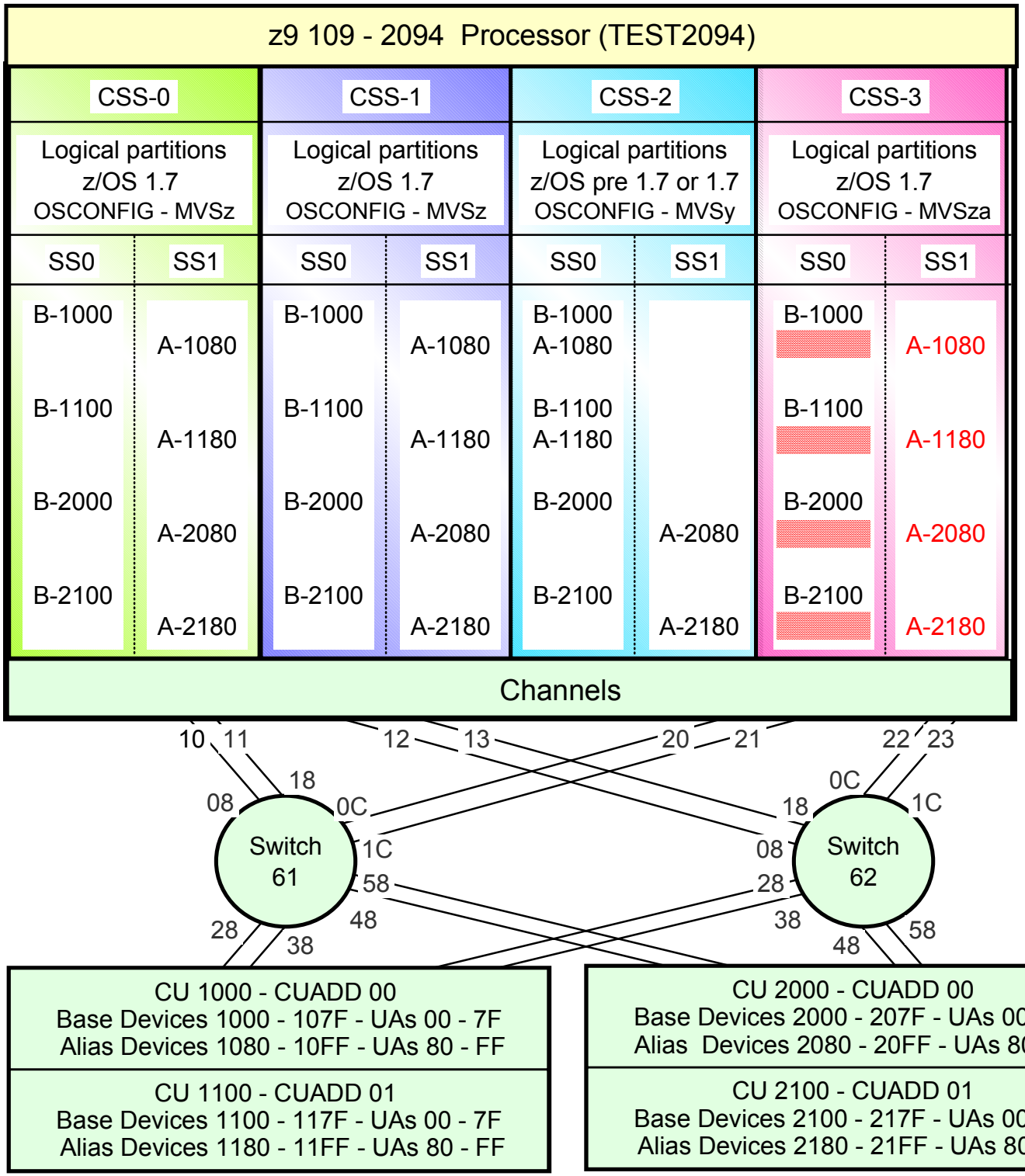
BM System z9 109 - 2094 - Configuration Support - Alias Support in CSS2 and CSS3 - SS1)



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 subchannels instead of SS0 subchannels
- This allows all the subchannels in SS0 to be used in support of additional Base DASD devices and other devices (non-DASD)
- z/OS 1.7 will support Alias devices defined in either SS0 subchannels or SS1 subchannels
  - Note an alias device can only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports alias devices that are defined in SS0 subchannels
- An Alias devices can be defined in SS0 subchannels in one CSS and SS1 subchannels in another CSS
- This example shows Alias devices defined in SS0 for CSS0 and CSS1, and in SS1 for CSS2 and CSS3. Therefore z/OS pre 1.7 systems cannot run in CSS2 or CSS3 *& still access all the alias devices*
- Note: This configuration definition will require one Processor definition (PROC.id) and three OSCONFIG definitions (MVSx, MVSy, MVSz)
  - CSS0/1 z/OS pre 1.7 OSCONFIG - MVSx
  - CSS-2 z/OS 1.7 OSCONFIG - MVSy
  - CSS-3 z/OS 1.7 OSCONFIG - MVSz
  - MVSx supports Aliases only in SS0
  - MVSy supports SS0 A-1080 and A-1180
  - MVSy supports SS1 A-2080 and A-2180
  - MVSz supports SS1 A-1080 and A-1180
  - MVSz supports SS1 A-2080 and A-2180
- This configuration definition approach can be used when migrating from z/OS pre 1.7 to z/OS 1.7 for partitions in CSS-0,1,2

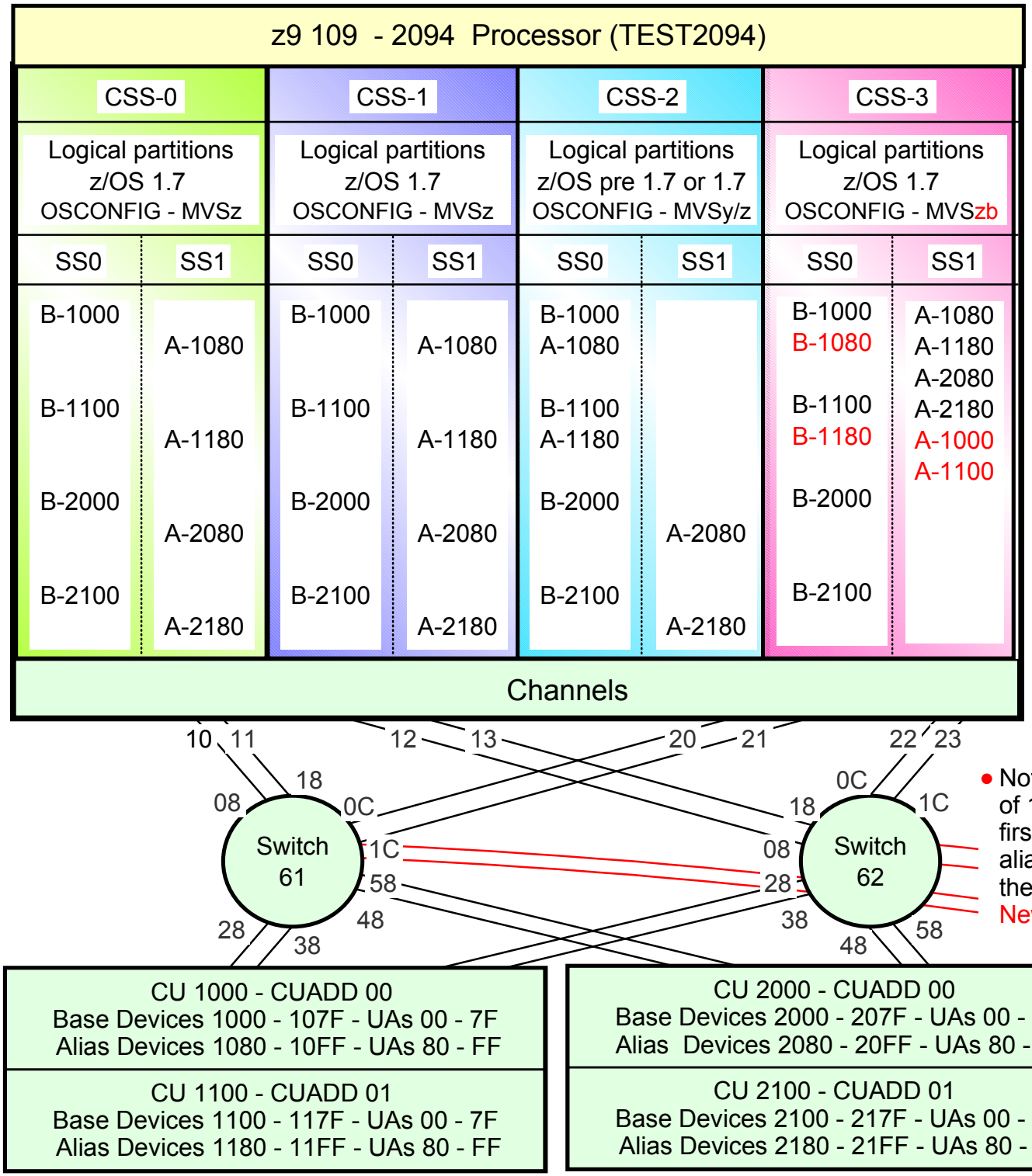
- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

BM System z9 109 - 2094 - Configuration Support - Additional Base Device number support



- The benefit of moving the alias device numbers out of SS0 into CSS1, is to 'free up' device number subchannels out of SS0 so that those device number subchannels can then be used to support the installation of additional DASD base device hardware
- At this time 4 device number 'spaces' or 'holes' has been created that can be used for the installation of additional devices
  - z/OS Base devices require base device number subchannels out of SS0
  - z/OS 1.7 Alias device number subchannels can reside in SS0 or SS1, or some may reside in SS0 and others may reside in SS1

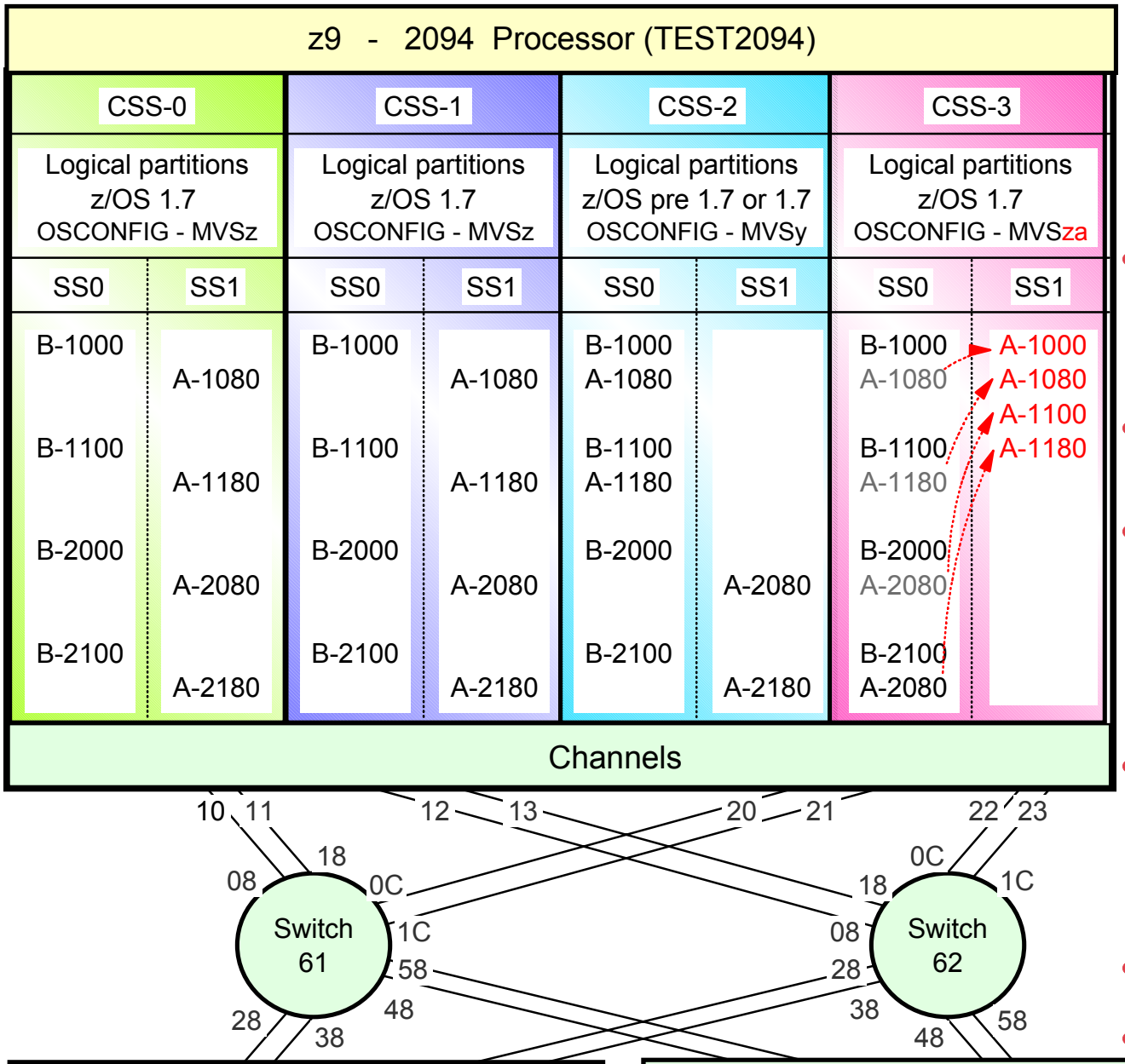
- Note: For these examples each DASD LSS has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS



- The benefit of moving the alias device numbers out of SS0 into SS1, is to 'free up' device numbers (subchannels) out of SS0 that can than be used to support the installation of additional DASD base device hardware
- z/OS Base devices require device number subchannels out of SS0
  - Base device 'device numbers' in new CU numbers 1080 and 1180 are added to the new IODF in CSS-3 SS0 And in the new OSCONFIG MVSzb.
- z/OS 1.7 Alias device 'device number' subchannels can reside in SS0 or SS1, or some may reside in SS0 and others may reside in SS1
  - Alias device numbers in new CU numbers 1080, 1180, 2080 and 2180 are added to CSS-3 SS1 and in the new OSCONFIG as residing in SS1, as SS1 aliases device numbers, 1200, 1280, 1300, 1380

- Note: For these examples each DASD LSS has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS. New CUs 1080 and 1180 are shown below. New CUs 2080 and 2180 are not shown.

CU 1000 - CUADD 00 Base Devices 1000 - 107F - UAs 00 - 7F Alias Devices 1080 - 10FF - UAs 80 - FF	CU 2000 - CUADD 00 Base Devices 2000 - 207F - UAs 00 - 7F Alias Devices 2080 - 20FF - UAs 80 - FF	CU 1080 - CUADD 00 Base Devices 1080 - 10FF - UAs 00 - 7F Alias Device UAs 80 - FF
CU 1100 - CUADD 01 Base Devices 1100 - 117F - UAs 00 - 7F Alias Devices 1180 - 11FF - UAs 80 - FF	CU 2100 - CUADD 01 Base Devices 2100 - 217F - UAs 00 - 7F Alias Devices 2180 - 21FF - UAs 80 - FF	CU 1180 - CUADD 01 Base Devices 1180 - 11FF - UAs 00 - 7F Alias Device UAs 80 - FF



- As the second set of subchannels provides a second set of device numbers just like the Base devices numbers, which can be any non-duplicated device number between 0000 and FFFF, the Alias device numbers in the second subchannel set can also be any non-duplicated device number between 0000 and FFFF.
- An Alias device 'device number' in the second subchannel set that matches an Alias Device or Base device 'device number' in the first subchannel set is not considered as being a duplicate device number.
- There is no 'device number' connection between the two subchannel sets. The only connection can be the CU.
- The only condition is that a logical/physical device UA assigned to a device number in a CU definition cannot be used twice in the same CSS. That means, the CU/Device UA cannot be defined to a device number in SS0 then also to another device number in SS1 of the same CSS
- When Alias devices on CUs 1000, 1100, 2000, 2100 in CSS-3 SS0 were initially moved to CSS-3 SS1 they could have been assigned different device numbers at that time. Or they can be assigned different device numbers later, after they have been moved to CSS-3 SS1.
- Dynamic I/O software and hardware activation is required as previously stated.
- No Reset Profile activation is required

CU 1000 - CUADD 00
Base Devices 1000 - 107F - UAs 00 - 7F
Alias Devices 1080 - 10FF - UAs 80 - FF

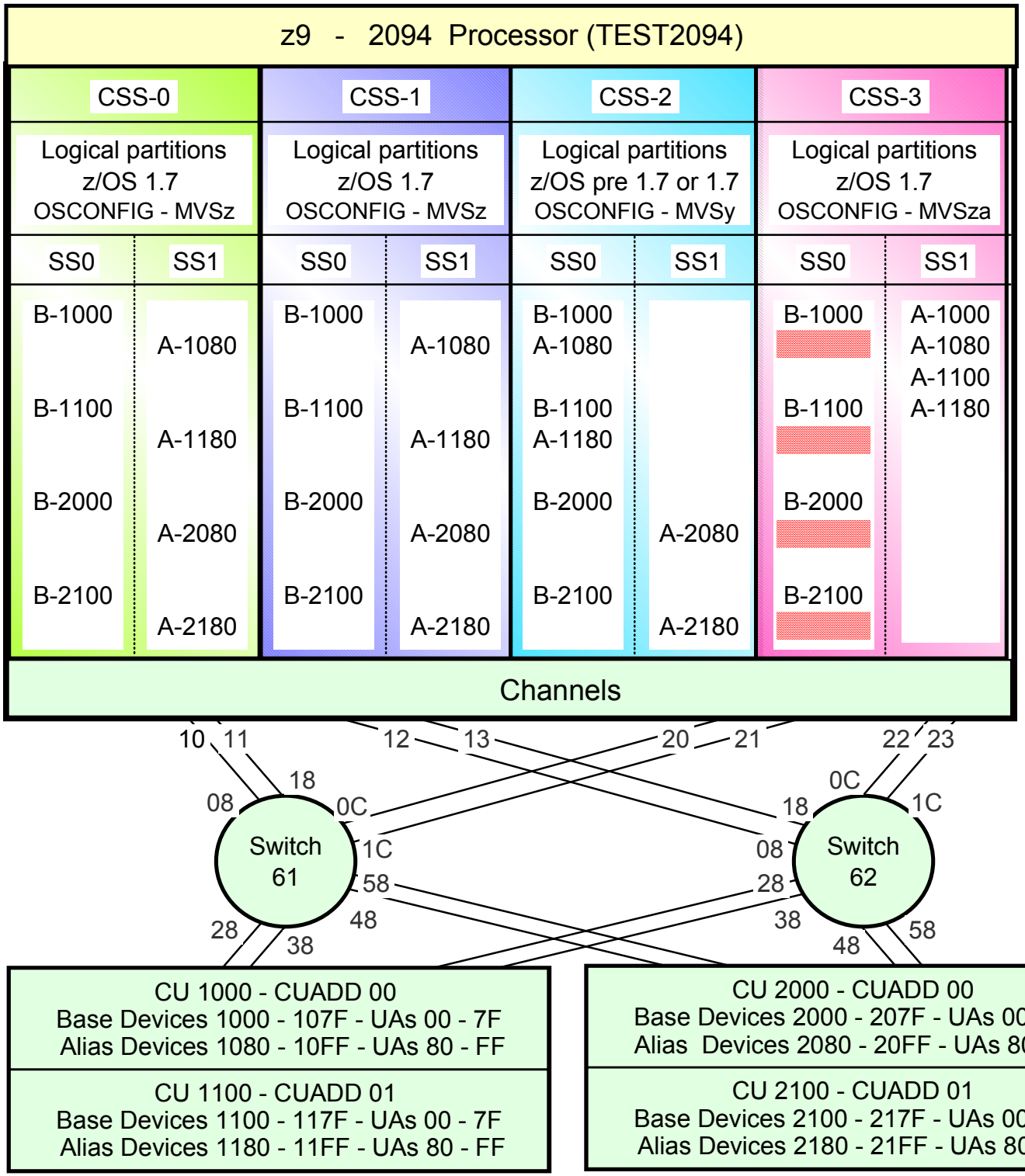
CU 1100 - CUADD 01
Base Devices 1100 - 117F - UAs 00 - 7F
Alias Devices 1180 - 11FF - UAs 80 - FF

CU 2000 - CUADD 00
Base Devices 2000 - 207F - UAs 00 - 7F
Alias Devices 2080 - 20FF - UAs 80 - FF

CU 2100 - CUADD 01
Base Devices 2100 - 217F - UAs 00 - 7F
Alias Devices 2180 - 21FF - UAs 80 - FF

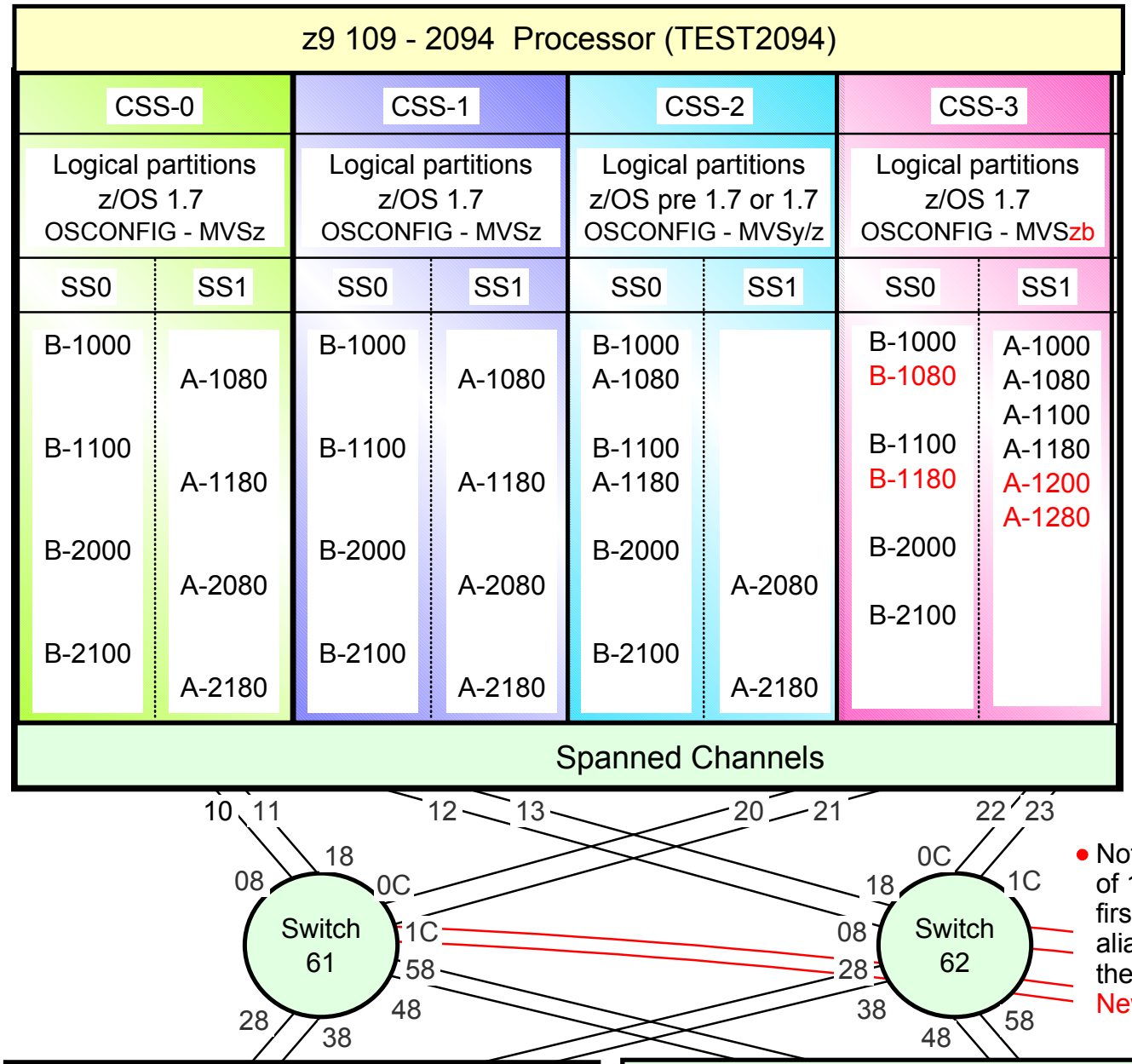
- Note: For these examples each DASD LSS has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

BM System z9 109 - 2094 - Configuration Support - Additional Base Device number support



- The benefit of moving the alias device numbers out of SS0 into CSS1, is to 'free up' device number subchannels out of SS0 so that those device number subchannels can then be used to support the installation of additional DASD base device hardware
  - z/OS Base devices require base device number subchannels out of SS0
  - z/OS 1.7 Alias device number subchannels can reside in SS0 or SS1, or some may reside in SS0 and others may reside in SS1

- Note: For these examples each DASD LSS has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS



- The benefit of moving the alias device numbers out of SS0 into SS1, is to 'free up' device numbers (subchannels) out of SS0 that can than be used to support the installation of additional DASD base device hardware
- z/OS Base devices require device number subchannels out of SS0
  - Base device 'device numbers' in new CU numbers 1080,1180, 2080 and 2180, are added to the new IODF in CSS-3 SS0 And in the new OSCONFIG MVSzb.
- z/OS 1.7 Alias device 'device number' subchannels can reside in SS0 or SS1, or some may reside in SS0 and others may reside in SS1
  - Alias device numbers in new CU numbers 1080, 1180, 2080 and 2180 are added to CSS-3 SS1 and in the new OSCONFIG as residing in SS1, as SS1 aliases device numbers, 1200, 1280, 1300, 1380

- Note: For these examples each DASD LSS has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS. New CUs 1080 and 1180 are shown below. New CUs 2080 and 2180 are not shown.

CU 1000 - CUADD 00 Base Devices 1000 - 107F - UAs 00 - 7F Alias Devices 1080 - 10FF - UAs 80 - FF	CU 2000 - CUADD 00 Base Devices 2000 - 207F - UAs 00 - 7F Alias Devices 2080 - 20FF - UAs 80 - FF	CU 1080 - CUADD 00 Base Devices 1080 - 10FF - UAs 00 - 7F Alias Device UAs 80 - FF
CU 1100 - CUADD 01 Base Devices 1100 - 117F - UAs 00 - 7F Alias Devices 1180 - 11FF - UAs 80 - FF	CU 2100 - CUADD 01 Base Devices 2100 - 217F - UAs 00 - 7F Alias Devices 2180 - 21FF - UAs 80 - FF	CU 1180 - CUADD 01 Base Devices 1180 - 11FF - UAs 00 - 7F Alias Device UAs 80 - FF

IBM System z9 109 - 2094 I/O Configuration Support

- Subchannel Sets
- Alias Device Support

End of Presentation - Part 1

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

IBM System z9 109 - 2094
I/O Configuration Definition Support
HCD - IOCP - HCM CMT - Dynamic I/O Reconfiguration

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

- HCD - Hardware Configuration Dialog
  - IODF - Processor and Operating System Support
    - Processor.id
    - OSCONFIG.id - need OSCONFIG for groups of CSSs
- HCM- Hardware Configuration Manager
  - HCM file
  - HCR file
- IOCP - Input Output Configuration Program
  - IOCDS processor files
- CMT - CHPID Mapping Tool
  - Input files - direct and indirect
    - CF Report (Order report)
    - IOCP validated file
  - Output files - direct and indirect
    - IOCP (with PCHIDs)
    - Mapping Reports
- IBM Manufacturing CONFIG file CD
  - Renaming of CONFIG file for PCHID movement
    - 2084 to 2094 upgrade
- Dynamic I/O Reconfiguration
  - Activate - commands / process

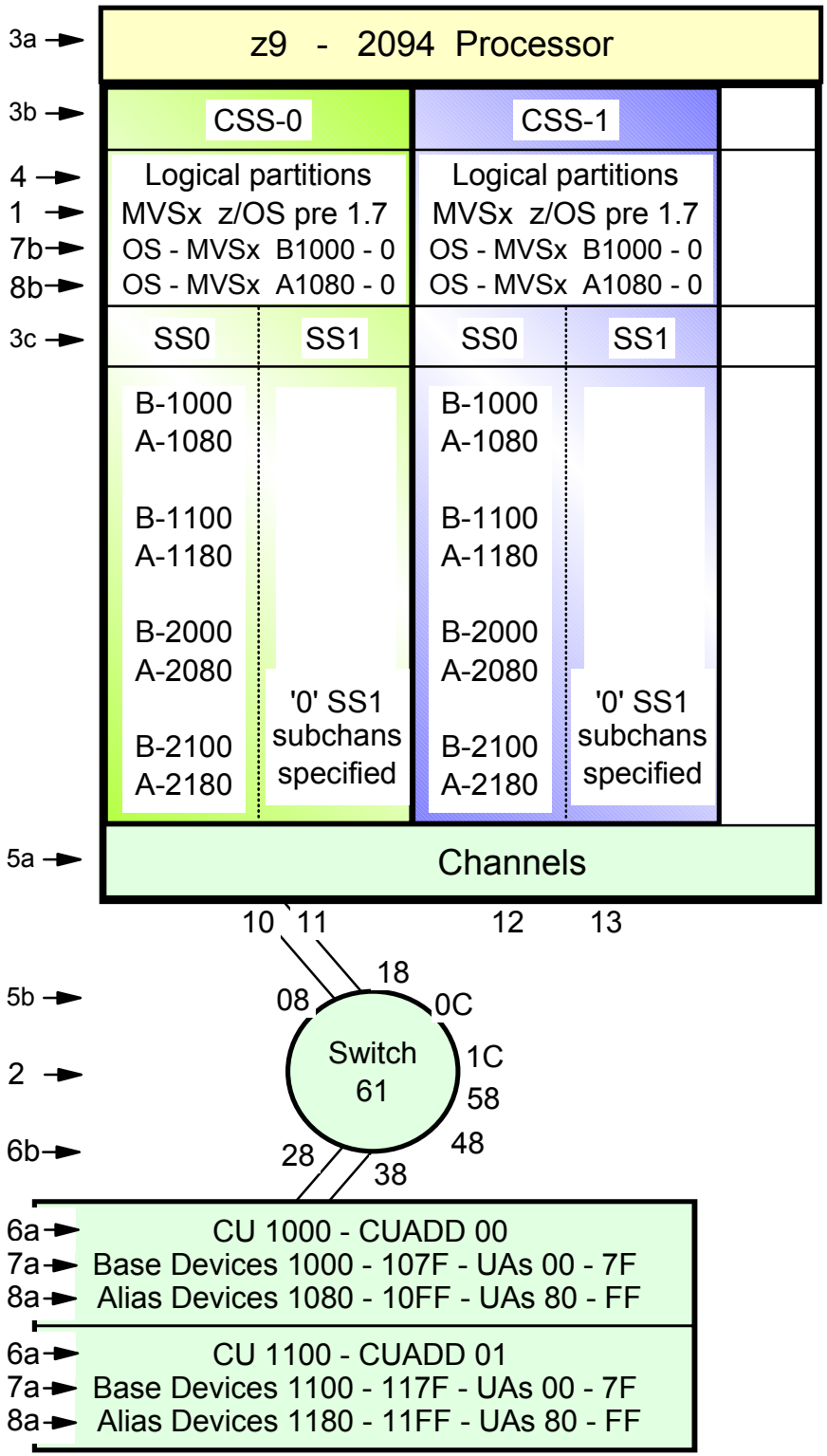
IBM System z9 109 - 2094
I/O Configuration Definition Support
I/O Configuration Definition Process

HCD - IOCP - HCM CMT - Dynamic I/O Reconfiguration

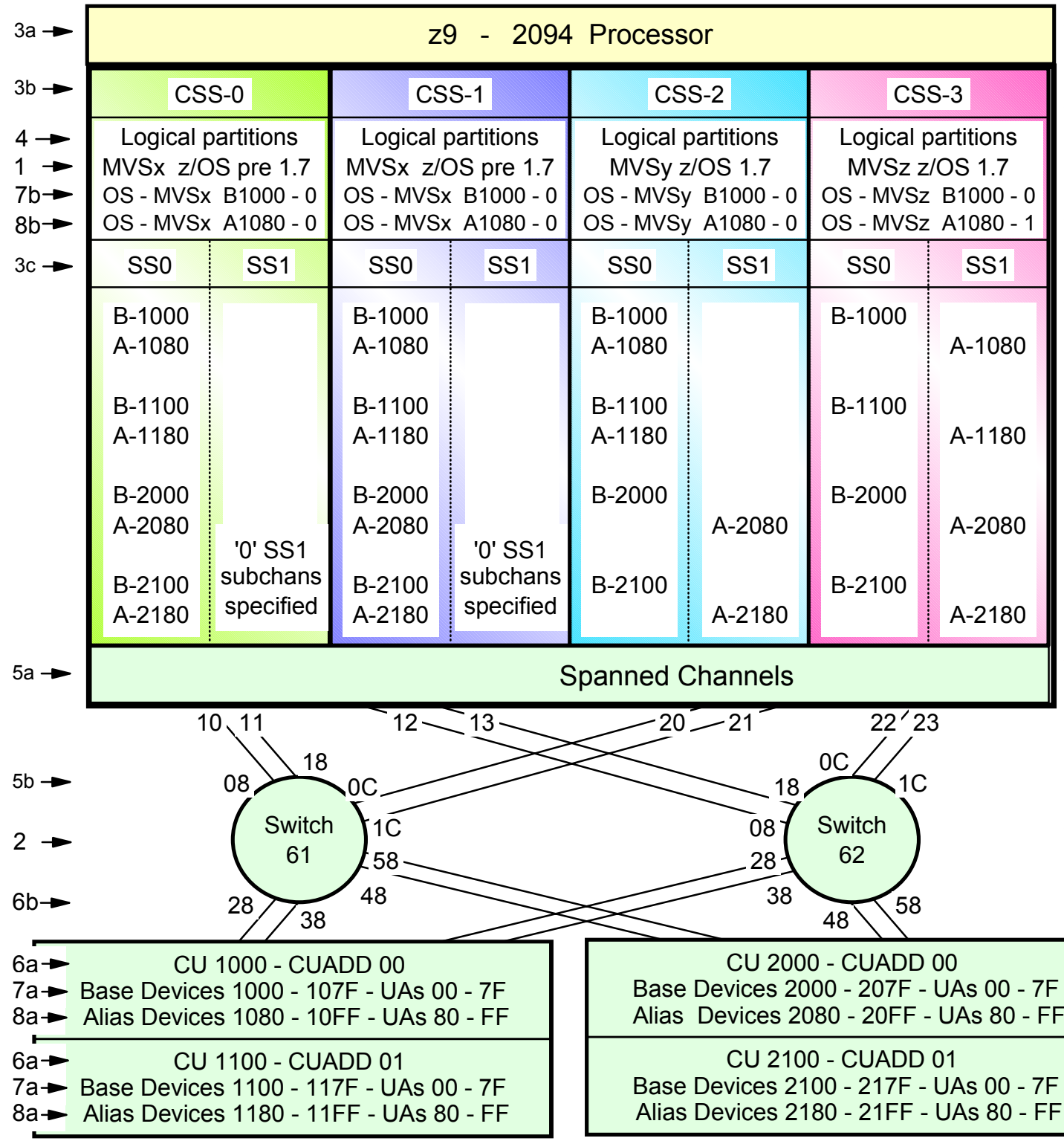
Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

- 2094 - HCD - Hardware Configuration Dialog - Definition Sequence
  - Operating Systems
    - **Multiple OSCONFIG.id may be required**
    - Esoterics
    - Devices (includes consoles)
  - Switches
  - Processor
    - Type, Model, Mode
    - Channel Subsystems
      - **Number of subchannels in a subchannel set for each defined CSS**
      - Partitions
      - Channels -Type, Mode, Access (to partitions), Connection Topology, PCHID
  - Control Units
    - Connection to channels (to processor and CSS)
  - I/O device
    - Device number and Unit Address
    - Connection to CU
    - **Subchannel Set location**
    - Partition Access
    - CSS Access
    - OSCONFIG - MVSx definition
      - Subchannel set location
    - OSCONFIG - MVSy definition
      - Alias device subchannel set location
    - OSCONFIG - MVSz definition
      - Alias device subchannel set location

- The definition sequence shown here Is the sequence that is used in the following foils in this part of the presentation
  - Black definition to be done
  - Red definition being performed
  - Blue definition complete



IBM System z9 109 - 2094 - Configuration Definition Support - No items defined - Open an IODF



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 instead of SS0
- This allows all the subchannels in SS0 to be used in support of additional Base DASD devices and other devices (non-DASD)
- z/OS 1.7 will support Alias devices defined in either SS0 or SS1 Alias
  - Note an alias device csn only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports alias devices that are defined in SS0
- An Alias devices can be defined in SS0 in one CSS and SS1 in another CSS
- This example shows Alias devices defined in SS0 for CSS0 and CSS1, and in SS1 for CSS2 and CSS3. Therefore z/OS pre 1.7 systems cannot run in CSS2 or CSS3 and still acess all the alias devices
- Note: This configuration definition will require one Processor definition (PROC.id) and three OSCONFIG definitions (MVSx, MVSy, MVSz)
  - z/OS pre 1.7 - OSCONFIG - MVSx
  - z/OS 1.7 OSCONFIG - MVSy or MVSz
- This configurstion definition approach can be used when migrating from z/OS pre 1.7 to z/OS 1.7 for paritions in CSS-0,1,2
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

z/OS V1.7HCD - Main Menu Panel

```
                          z/OS V1.7 HCD
Command ===> ____________________________________________________________

                            Hardware Configuration

Select one of the following.

1   1.  Define, modify, or view configuration data
    2.  Activate or process configuration data
    3.  Print or compare configuration data
    4.  Create or view graphical configuration report
    5.  Migrate configuration data
    6.  Maintain I/O definition files
    7.  Query supported hardware and installed UIMs
    8.  Getting started with this dialog
    9.  What's new in this release

For options 1 to 5, specify the name of the IODF to be used.

I/O definition file . . . 'TROWELL.IODF8E.WORK'                    +


 F1=Help      F2=Split     F3=Exit      F4=Prompt    F9=Swap      F12=Cancel
F22=Command
```

z/OS V1.7 HCD - Main Menu Panel - option 6.4

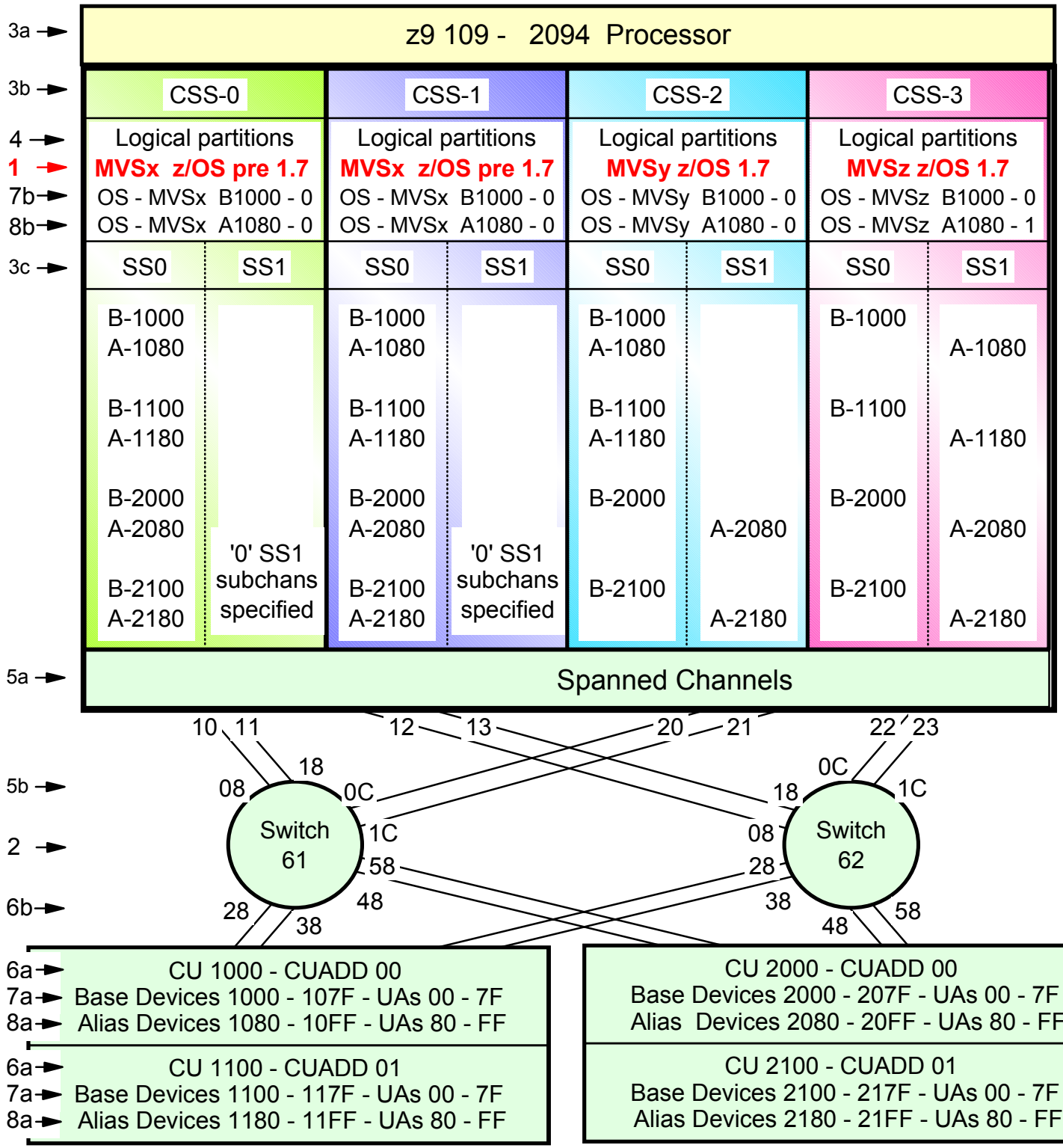
```
                    View I/O Definition File Information


IODF name  . . . . . : 'TROWELL.IODF8F.WORK'
IODF type  . . . . . : Work
IODF version . . . . : 5

Creation date  . . . . : 2005-03-19
Last update  . . . . . : 2005-06-02  14:16

Volume serial number . : SBOX77
Allocated space  . . . : 1024    (Number of 4K blocks)
Used space . . . . . : 123     (Number of 4K blocks)
   thereof utilized (%)  27

Activity logging . . . : Yes
Backup IODF name . . . :

Description  . . . . . :



 F1=Help    F2=Split   F3=Exit    F9=Swap   F12=Cancel
```

z/OS V1.7 HCD IODF uses a version **5** IODF. Version 5 IODFs cannot be changed by HCD v1.4

Version 5 IODF uses device number grouping, makes the IODF smaller and quicker to use.

z/OS level	HCD Version	IODF Version	Device Number Grouping	Device Number Grouping I/O List Example	IODF Size Example 4K Blocks
1.4 - 1.6	1.4	4	No	86 K	318 K
1.7	1.7	5	Yes	4 K	14 K

IBM System z9 109 - 2094 - Configuration Definition Support - OSCONFIG Definitions



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
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  - Note an alias device csn only be defined in one Subchannel set within a CSS
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- Note: This configuration definition will require one Processor definition (PROC.id) and three OSCONFIG definitions (MVSx, MVSy, MVSz)
  - z/OS pre 1.7 - OSCONFIG - MVSx
  - z/OS 1.7 OSCONFIG - MVSy or MVSz
- This configurstion definition approach can be used when migrating from z/OS pre 1.7 to z/OS 1.7 for paritions in CSS-0,1,2
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

z/OS V1.7HCD - Main Menu Panel

```
                          z/OS V1.7 HCD
Command ===> ____________________________________________________________

                            Hardware Configuration

Select one of the following.

1    1.  Define, modify, or view configuration data
     2.  Activate or process configuration data
     3.  Print or compare configuration data
     4.  Create or view graphical configuration report
     5.  Migrate configuration data
     6.  Maintain I/O definition files
     7.  Query supported hardware and installed UIMs
     8.  Getting started with this dialog
     9.  What's new in this release

For options 1 to 5, specify the name of the IODF to be used.

I/O definition file . . . 'TROWELL.IODF8E.WORK'                    +


 F1=Help       F2=Split      F3=Exit       F4=Prompt     F9=Swap      F12=Cancel
F22=Command
```

z/OS V1.7 HCD - Main Definition Selection (option 1.1)

```
                Define, Modify, or View Configuration Data

    Select type of objects to define, modify, or view data.

     1_ 1. Operating system configurations
              consoles
              system-defined generics
              EDTs
                esoterics
                user-modified generics
        2. Switches
              ports
              switch configurations
                port matrix
        3. Processors
              channel subsystems
                partitions
                channel paths
        4. Control units
        5. I/O devices
F1=Help    F2=Split   F3=Exit    F9=Swap    F12=Cancel
```

z/OS V1.7 HCD - Define OSCONFIG - Define MVSX (option 1.1)

```
                    Add Operating System Configuration


Specify or revise the following values.

OS configuration ID  . . . . . MVSX_____
Operating system type  . . . . MVS       +

Description  . . . . . . . . . ____________________________________

 F1=Help    F2=Split   F3=Exit    F4=Prompt  F5=Reset   F9=Swap
```

- With the 2094 processor an alias device can be defined in either subchannel set 0 or 1 (SS0 or SS1) for a given CSS and the alias device number in SS1 can be the same as another device number in SS0
- Both the device defined in SS0 and SS1 (for a given CSS) will still be defined in the OSCONFIG (as a UCB) to allow z/OS to use the devices. Therefore there is a need to specify in the OSCONFIG for where the alias device resides when the alias device's supporting subchannel resides in SS1
- Because the location of alias device subchannels can be different between each of the CSSs , and if different, then this will require different OSCONFIGs for the z/OS depending which CSS the z/OS is running in and where the alias device subchannel resides .For this example:
  - CONFIG MVSx used by z/OS partitions in in CSS0 and CSS1
  - CONFIG MVSy used by z/OS partitions in in CSS2
  - CONFIG MVSz used by z/OS partitions in in CSS3

z/OS V1.7 HCD - Define OSCONFIG - MVSX - ADD EDT (option 1.1.s)

```
                                  EDT List
Backup  Query  Help
 ------------------------------------------------------------------------

 Command ===> ____________________________________________ Scroll ===> PAGE

 Select one or more EDTs, then press Enter. To add, use F11.

 Configuration ID . : MVSX

 / EDT Last Update By       Description
************************** Bottom of data ****************************
```

- With the 2094 processor an alias device can be defined in either subchannel set 0 or 1 (SS0 or SS1) for a given CSS and the alias device number in SS1 can be the same as another device number in SS0
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  - CONFIG MVSx used by z/OS partitions in in CSS0 and CSS1
  - CONFIG MVSy used by z/OS partitions in in CSS2
  - CONFIG MVSz used by z/OS partitions in in CSS3

z/OS V1.7 HCD - Define OSCONFIG - MVSX - EDT (option 1.1.s.s)

```
                                  Add EDT

Specify the following values.

Configuration ID . : MVSX

EDT identifier . . . 01
Description  . . . . _____________________________________

 F1=Help      F2=Split     F3=Exit      F5=Reset     F9=Swap     F12=Cancel
```

- With the 2094 processor an alias device can be defined in either subchannel set 0 or 1 (SS0 or SS1) for a given CSS and the alias device number in SS1 can be the same as another device number in SS0
- Both the device defined in SS0 and SS1 (for a given CSS) will still be defined in the OSCONFIG (as a UCB) to allow z/OS to use the devices. Therefore there is a need to specify in the OSCONFIG for where the alias device resides when the alias device's supporting subchannel resides in SS1
- Because the location of alias device subchannels can be different between each of the CSSs , and if different, then this will require different OSCONFIGs for the z/OS depending which CSS the z/OS is running in and where the alias device subchannel resides .For this example:
  - CONFIG MVSx used by z/OS partitions in in CSS0 and CSS1
  - CONFIG MVSy used by z/OS partitions in in CSS2
  - CONFIG MVSz used by z/OS partitions in in CSS3

z/OS V1.7 HCD - Define OSCONFIG - MVSX - EDT - ADD Esoteric (option 1.1.s.s)

```
                                  EDT List
  Goto  Backup  Query  Help
--------------------------------------------------------------------------------
                                                                    Row 1 of 1
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more EDTs, then press Enter. To add, use F11.

Configuration ID . : MVSX

/ EDT Last Update By       Description
_ 01  2005-06-04  TROWELL  ____________________________________
********************************* Bottom of data ********************************
```

- With the 2094 processor an alias device can be defined in either subchannel set 0 or 1 (SS0 or SS1) for a given CSS and the alias device number in SS1 can be the same as another device number in SS0
- Both the device defined in SS0 and SS1 (for a given CSS) will still be defined in the OSCONFIG (as a UCB) to allow z/OS to use the devices. Therefore there is a need to specify in the OSCONFIG for where the alias device resides when the alias device's supporting subchannel resides in SS1
- Because the location of alias device subchannels can be different between each of the CSSs , and if different, then this will require different OSCONFIGs for the z/OS depending which CSS the z/OS is running in and where the alias device subchannel resides .For this example:
  - CONFIG MVSx used by z/OS partitions in in CSS0 and CSS1
  - CONFIG MVSy used by z/OS partitions in in CSS2
  - CONFIG MVSz used by z/OS partitions in in CSS3

z/OS V1.7 HCD - Define OSCONFIG - MVSX - Esoteric List (option 1.1.s.s)

```
                              Esoteric List
  Goto  Filter  Backup  Query  Help
------------------------------------------------------------------------
                                                              Row 1 of 3
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more esoterics, then press Enter. To add, use F11.

Configuration ID . : MVSX
EDT identifier . . : 01

/ Esoteric  VIO    Token  State
_ DASD      No     ____   No device defined
_ SYSDA     No     ____   No device defined
_ TAPE      No     ____   No device defined
*************************** Bottom of data ****************************




 F1=Help       F2=Split      F3=Exit       F4=Prompt     F5=Reset
 F7=Backward   F8=Forward    F9=Swap      F10=Actions    F11=Add
F12=Cancel    F13=Instruct  F22=Command
```

Display Defined OSCONFIG's - MVSX - MVSY - MVSZ

```
                    Operating System Configuration List                Row 1 of 3
Command ===> _____________________________________________ Scroll ===> PAGE

Select one or more operating system configurations, then press Enter. To
add, use F11.

/ Config. ID   Type     Description
_ MVSx         MVS      ____________________________________
_ MVSy         MVS      ____________________________________
_ MVSz         MVS      ____________________________________
******************************* Bottom of data ********************************



 F1=Help       F2=Split      F3=Exit       F4=Prompt     F5=Reset      F7=Backward
 F8=Forward    F9=Swap      F10=Actions   F11=Add       F12=Cancel    F13=Instruct
F22=Command
```

- With the 2094 processor an alias device can be defined in either subchannel set 0 or 1 (SS0 or SS1) for a given CSS and the alias device number in SS1 can be the same as another device number in SS0
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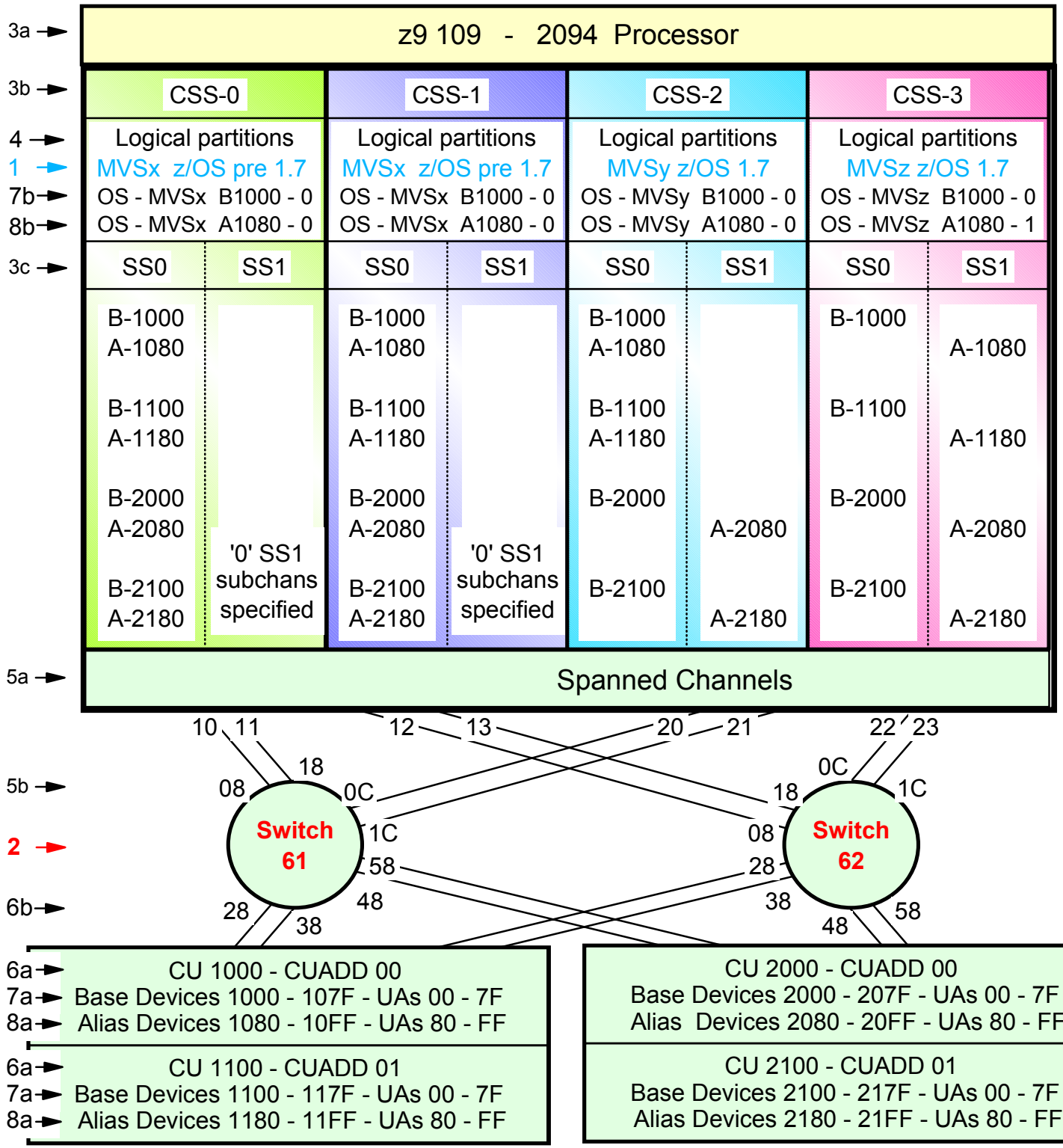
  - CONFIG MVSx used by z/OS partitions in in CSS0 and CSS1
  - CONFIG MVSy used by z/OS partitions in in CSS2
  - CONFIG MVSz used by z/OS partitions in in CSS3

IBM System z9 109 - 2094 - Configuration Definition Support - Switch Definitions



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 instead of SS0
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- This example shows Alias devices defined in SS0 for CSS0 and CSS1, and in SS1 for CSS2 and CSS3. Therefore z/OS pre 1.7 systems cannot run in CSS2 or CSS3 and still acess all the alias devices
- Note: This configuration definition will require one Processor definition (PROC.id) and three OSCONFIG definitions (MVSx, MVSy, MVSz)
  - z/OS pre 1.7 - OSCONFIG - MVSx
  - z/OS 1.7 OSCONFIG - MVSy or MVSz
- This configurstion definition approach can be used when migrating from z/OS pre 1.7 to z/OS 1.7 for paritions in CSS-0,1,2
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

z/OS V1.7 HCD - Main Definition Selection (option 1.2)

```
                Define, Modify, or View Configuration Data

    Select type of objects to define, modify, or view data.

     2_ 1. Operating system configurations
              consoles
              system-defined generics
              EDTs
                esoterics
                user-modified generics
        2. Switches
              ports
              switch configurations
                port matrix
        3. Processors
              channel subsystems
                partitions
                channel paths
        4. Control units
        5. I/O devices
F1=Help    F2=Split   F3=Exit    F9=Swap    F12=Cancel
```

z/OS V1.7 HCD - Define Switch Definition (option 1.2)

```
                              Add Switch

Specify or revise the following values.

Switch ID . . . . . . . . . 61  (00-FF)
Switch type . . . . . . . . 2032_________  +
Serial number . . . . . . . __________
Description . . . . . . . . ________________________________
Switch address  . . . . . . 61  (00-FF) for a FICON switch

Specify the port range to be installed only if a larger range
than the minimum is desired.

Installed port range  . . 04  -  8F  +

Specify either numbers of existing control unit and device, or
numbers for new control unit and device to be added.

Switch CU number(s) . . . 0061  ____  ____  ____  ____  +
Switch device number(s) . 0061  ____  ____  ____  ____
 F1=Help    F2=Split   F3=Exit    F4=Prompt  F5=Reset   F9=Swap
F12=Cancel
```

- Definition of switches as per the configuration diagram

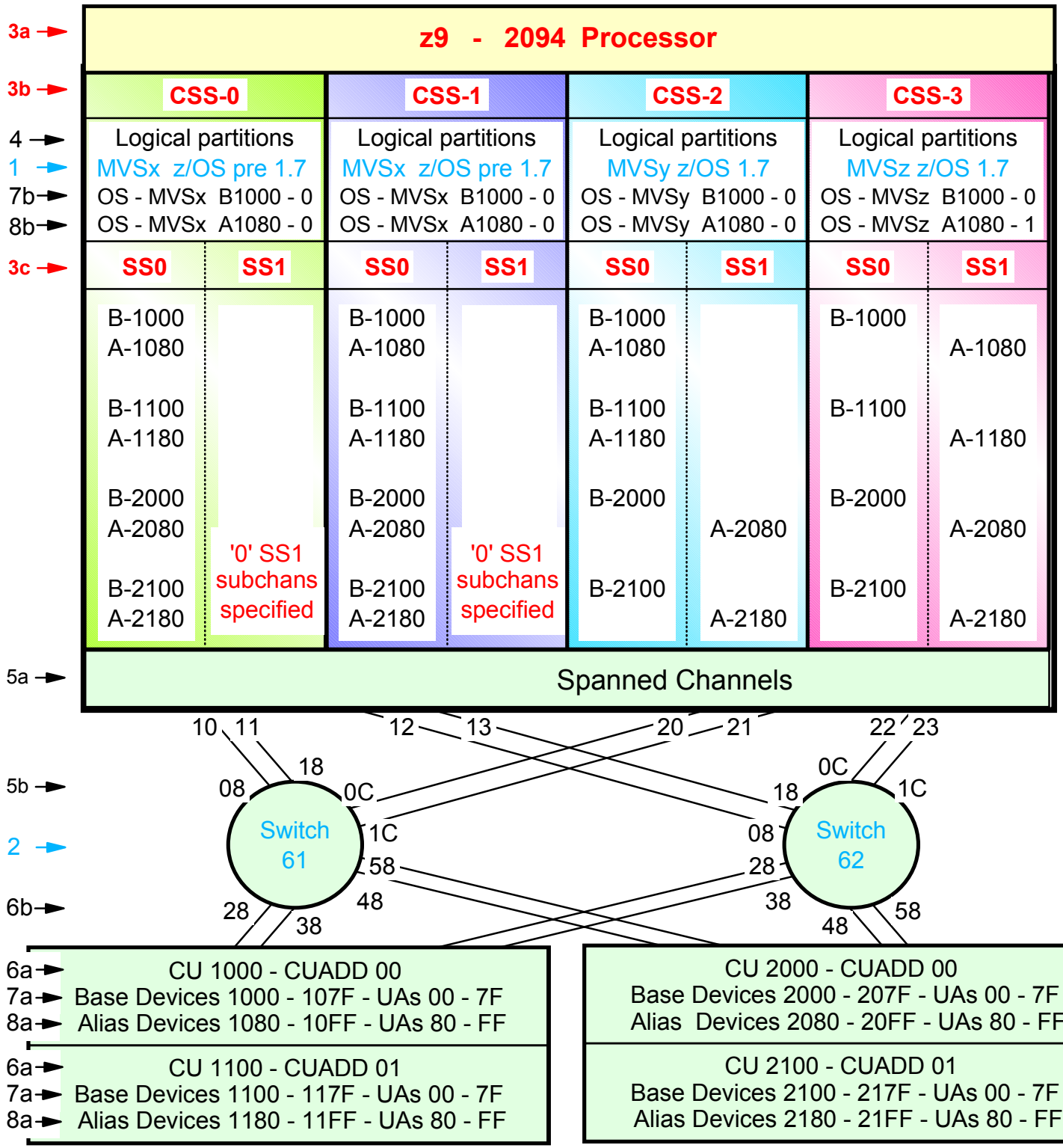
Display Defined Switch Definitions

```
                                  Switch List          Row 1 of 2 More:       >
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more switches, then press Enter. To add, use F11.

                                                                      CU   Dev
/ ID Type +         Ad Serial-# + Description                         Num. Num.
_ 61 2032           61 __________ ____________________________________ 0061 0061
_ 62 2032           62 __________ ____________________________________ 0062 0062
******************************* Bottom of data ********************************
```

- FICON switches defined as per the configuration diagram



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  - z/OS pre 1.7 - OSCONFIG - MVSx
  - z/OS 1.7 OSCONFIG - MVSy or MVSz
- This configurstion definition approach can be used when migrating from z/OS pre 1.7 to z/OS 1.7 for paritions in CSS-0,1,2
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

z/OS V1.7 HCD - Main Definition Selection (option 1.3)

```
                Define, Modify, or View Configuration Data

    Select type of objects to define, modify, or view data.

     3  1. Operating system configurations
              consoles
              system-defined generics
              EDTs
                esoterics
                user-modified generics
        2. Switches
              ports
              switch configurations
                port matrix
        3. Processors
              channel subsystems
                partitions
                channel paths
        4. Control units
        5. I/O devices
F1=Help    F2=Split   F3=Exit    F9=Swap    F12=Cancel
```

Define z9 109 - 2094 Processor - Type - Model - Mode - # CSSs

- Processor definition of a 2094 processor defined to support 4 Channel Subsystems (CSS)

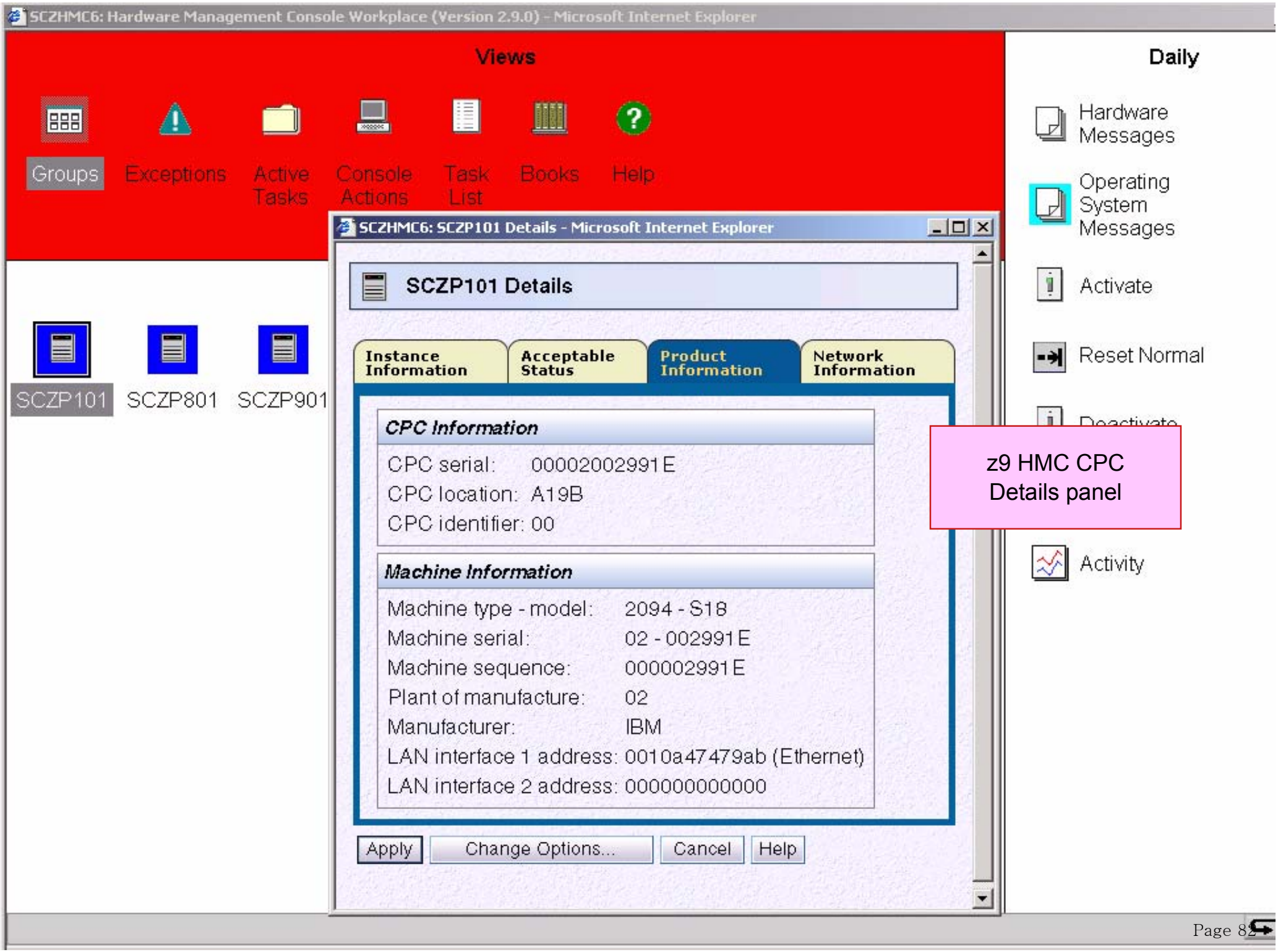
```
                                Add Processor


Specify or revise the following values.

Processor ID . . . . . . . . . . TEST2094

Processor type . . . . . . . . . 2094      +
Processor model  . . . . . . . . S18       +
Configuration mode . . . . . . . LPAR      +
Number of channel subsystems . . 4         +

Serial number  . . . . . . . . . _________
Description  . . . . . . . . . . ____________________________________

Specify SNA address only if part of an S/390 microprocessor cluster:

Network name . . . . . . . . . . usibmsc_  +
CPC name . . . . . . . . . . . . test2094  +

 F1=Help      F2=Split     F3=Exit      F4=Prompt    F5=Reset     F9=Swap
F12=Cancel
```

z9 109 Machine Type	Number of Books	Hardware Model CPC ND	Number of Characterizable PUs	Model Capacity Indicator CPC SI	Number CSSs	Number of SSs per CSS
2094	1	S08	8	700 - 708	1 - 4	1 or 2
2094	2	S18	18	700 - 718	1 - 4	1 or 2
2094	3	S28	28	700 - 728	1 - 4	1 or 2
2094	4	S38	38	700 - 738	1 - 4	1 or 2
2094	4	S54	54	700 - 754	1 - 4	1 or 2

Characterizable PU = CP - ICF - IFL IFA - SAP

z/OS - 'D M=CPU' Command results

```
D M=CPU
IEE174I 13.54.46 DISPLAY M 520
....
....
PROCESSOR STATUS
CPC ND = 002094.S18.IBM.02.0000000B0CBE
CPC SI = 2094.718.IBM.02.00000000000B0CBE
CPC ID = 00
CPC NAME = T47
LP NAME = TC4T01      LP ID =  1
CSS ID  = 0
MIF ID  = 1
```


SCZHMC6: Hardware Management Console Workplace (Version 2.9.0) - Microsoft Internet Explorer
Views
Groups
Exceptions
Active Tasks
Console Actions
Task List
Books
Help
Daily
Hardware Messages
Operating System Messages
Activate
Reset Normal
Activity
SCZP101
SCZP801
SCZP901
SCZHMC6: SCZP101 Details - Microsoft Internet Explorer
SCZP101 Details
Instance Information
Acceptable Status
Product Information
Network Information
CPC Information
CPC serial: 00002002991E
CPC location: A19B
CPC identifier: 00
Machine Information
Machine type - model: 2094 - S18
Machine serial: 02 - 002991E
Machine sequence: 000002991E
Plant of manufacture: 02
Manufacturer: IBM
LAN interface 1 address: 0010a47479ab (Ethernet)
LAN interface 2 address: 000000000000
Apply
Change Options...
Cancel
Help
z9 HMC CPC Details panel

Display / Define Processor: Processor List

```
x                                  Processor List        Row 1 of 1 More:       >
Command ===> ____________________________________________________ Scroll ===> PAGE

Select one or more processors, then press Enter. To add, use F11.


/ Proc. ID Type +   Model +  Mode+ Serial-# + Description
S TEST2094 2094     S18      LPAR  __________ ________________________________
```

Use HCD action code 's' to display the channel subsystem subchannels

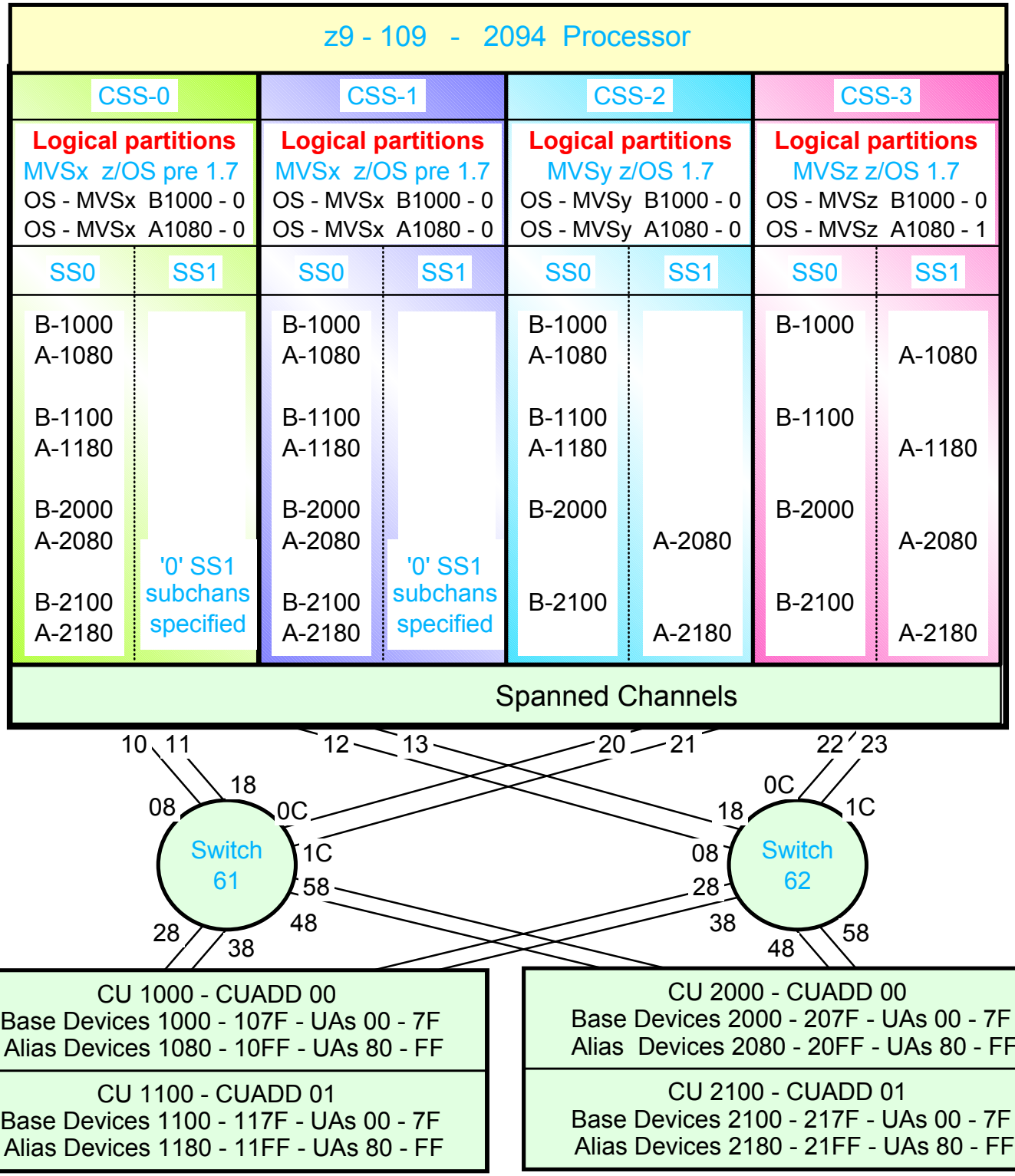
Display / Define Processor: Channel Subsystems - Subchannel Sets

New or Changed

```
                              Channel Subsystem List                  Row 1 of 4
Command ===> ____________________________________________________ Scroll ===> PAGE

Select one or more channel subsystems, then press Enter.  To add, use F11.

Processor ID . . . : TEST2094

   CSS Devices in SS0    Devices in SS1
/  ID  Maximum + Actual  Maximum + Actual  Description
_  0   64512     0       0         0       All LPs will use z/OS pre 1.7
_  1   64512     0       0         0       All LPs will use z/OS pre 1.7
_  2   65280     0       48256     0       LP mix of z/OS pre 1.7 and 1.7
_  3   65280     0       65535     0       All LPs will use z/OS 1.7

  Requested change has been performed, but cannot be activated dynamically.
```

- For the configuration shown in this presentation all 4 2094 Channel subsystems (CSSs) are defined
- A maximum device support of 64512 SS0 subchannels are specified for CSS 0, 1 and 3
- A maximum device support of 48256 SS0 subchannels are specified for CSS 2
- All alias devices for CSS 0 and CSS 1 will be efined in SS0, therefore no alias device support subchannels are required for SS1 for these two CSSs, therefore no SS1 alias device subchannels are specified
  - This will allow z/OS pre 1.7 to run in partitions in these two CSSs and still have access to all the alias devices (using OSCONFIG.id MVSx)
- For CSS2 some alias devices will be defined in SS0 and some in SS1 therefore a maximum of 48256 subchannels are specified for SS1 in CSS2
  - Some patitions in CSS2 will still run z/OS pre 1.7 with the alias devices supported by SS0 while other partitions will run z/OS 1.7 with selected alias device subchannels defined in SS1 (using OSCONFIG.id MVSy)
  - It is not recommended to define the system this way, it is just to show what can be defined and is supported
- CSS3 will have all its alias devices defined in SS1 therefore it has been defined to to support the maximum number of subchannels (64K - 1) in SS1
  - All partitions in CSS3 will run z/OS 1.7 to be able to access the alias devices (using OSCONFIG.id MVSz)

IBM System z9 109 - 2094 - Configuration Definition Support - Proccesor CSS Partition - Definitions



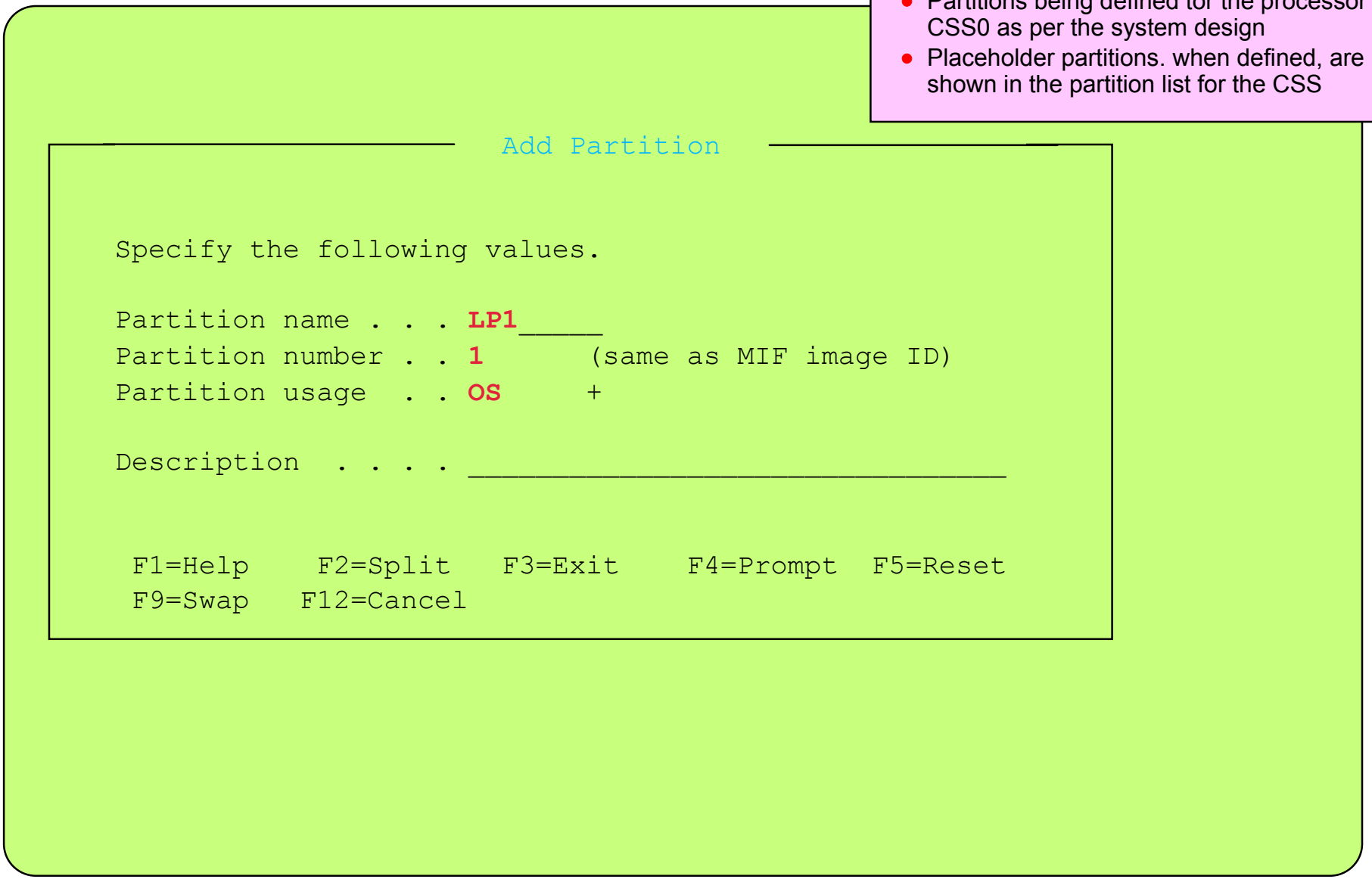
- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 instead of SS0
- This allows all the subchannels in SS0 to be used in support of additional Base DASD devices and other devices (non-DASD)
- z/OS 1.7 will support Alias devices defined in either SS0 or SS1 Alias
  - Note an alias device csn only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports alias devices that are defined in SS0
- An Alias devices can be defined in SS0 in one CSS and SS1 in another CSS
- This example shows Alias devices defined in SS0 for CSS0 and CSS1, and in SS1 for CSS2 and CSS3. Therefore z/OS pre 1.7 systems cannot run in CSS2 or CSS3 and still acess all the alias devices
- Note: This configuration definition will require one Processor definition (PROC.id) and three OSCONFIG definitions (MVSx, MVSy, MVSz)
  - z/OS pre 1.7 - OSCONFIG - MVSx
  - z/OS 1.7 OSCONFIG - MVSy or MVSz
- This configurstion definition approach can be used when migrating from z/OS pre 1.7 to z/OS 1.7 for paritions in CSS-0,1,2
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

z/OS V1.7 HCD - Main Definition Selection (option 1.3.s.p)

```
                Define, Modify, or View Configuration Data

    Select type of objects to define, modify, or view data.

     3_ 1. Operating system configurations
              consoles
              system-defined generics
              EDTs
                esoterics
                user-modified generics
        2. Switches
              ports
              switch configurations
                port matrix
        3. Processors
              channel subsystems
                partitions
                channel paths
        4. Control units
        5. I/O devices
F1=Help    F2=Split   F3=Exit    F9=Swap    F12=Cancel
```

Define Processor Partitions: Logical Partitions for CSS-0

- Partitions being defined tor the processor CSS0 as per the system design
- Placeholder partitions. when defined, are shown in the partition list for the CSS



Display Processor Partitions: Logical Partitions for CSS-0

- Partitions being defined tor the processor CSS0 as per the system design
- Placeholder partitions. when defined, are shown in the partition list for the CSS

```
                         Partition List
  Goto  Backup  Query  Help
--------------------------------------------------------------------------
                                                             Row 1 of 5
Command ===> ________________________________________ Scroll ===> PAGE

Select one or more partitions, then press Enter. To add, use F11.

Processor ID . . . . : TEST2094
Configuration mode  . : LPAR
Channel Subsystem ID  : 0         All LPs will use z/OS pre 1.7

/ Partition Name    Number Usage + Description
_ LP1               1      OS      ________________________________
_ LP2               2      OS      ________________________________
_ LP3               3      OS      ________________________________
_ LP8               8      OS      ________________________________
_ *                 7      OS      ________________________________
**************************** Bottom of data ****************************
```

Display Processor Partitions: Logical Partitions for CSS-1

- Partitions being defined tor the processor CSS1 as per the system design
- Placeholder partitions, when defined, are shown in the partition list for the CSS

```
                              Partition List
  Goto  Backup  Query  Help
--------------------------------------------------------------------------------
                                                                    Row 1 of 8
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more partitions, then press Enter. To add, use F11.

Processor ID  . . . . : TEST2094
Configuration mode  . : LPAR
Channel Subsystem ID  : 1          All LPs will use z/OS pre 1.7

/ Partition Name   Number Usage + Description
_ LPA              1      OS     ____________________________________
_ LPB              2      OS     ____________________________________
_ LPC              3      OS     ____________________________________
_ LPD              4      OS     ____________________________________
_ LPE              5      OS     ____________________________________
_ LPF              8      OS     ____________________________________
_ *                6      OS     ____________________________________
 F1=Help       F2=Split      F3=Exit       F4=Prompt     F5=Reset
 F7=Backward   F8=Forward    F9=Swap      F10=Actions   F11=Add
F12=Cancel    F13=Instruct  F22=Command
```

Display Processor Partitions: Logical Partitions for CSS-2

- Partitions being defined tor the processor CSS2 as per the system design
- Placeholder partitions, when defined, are shown in the partition list for the CSS

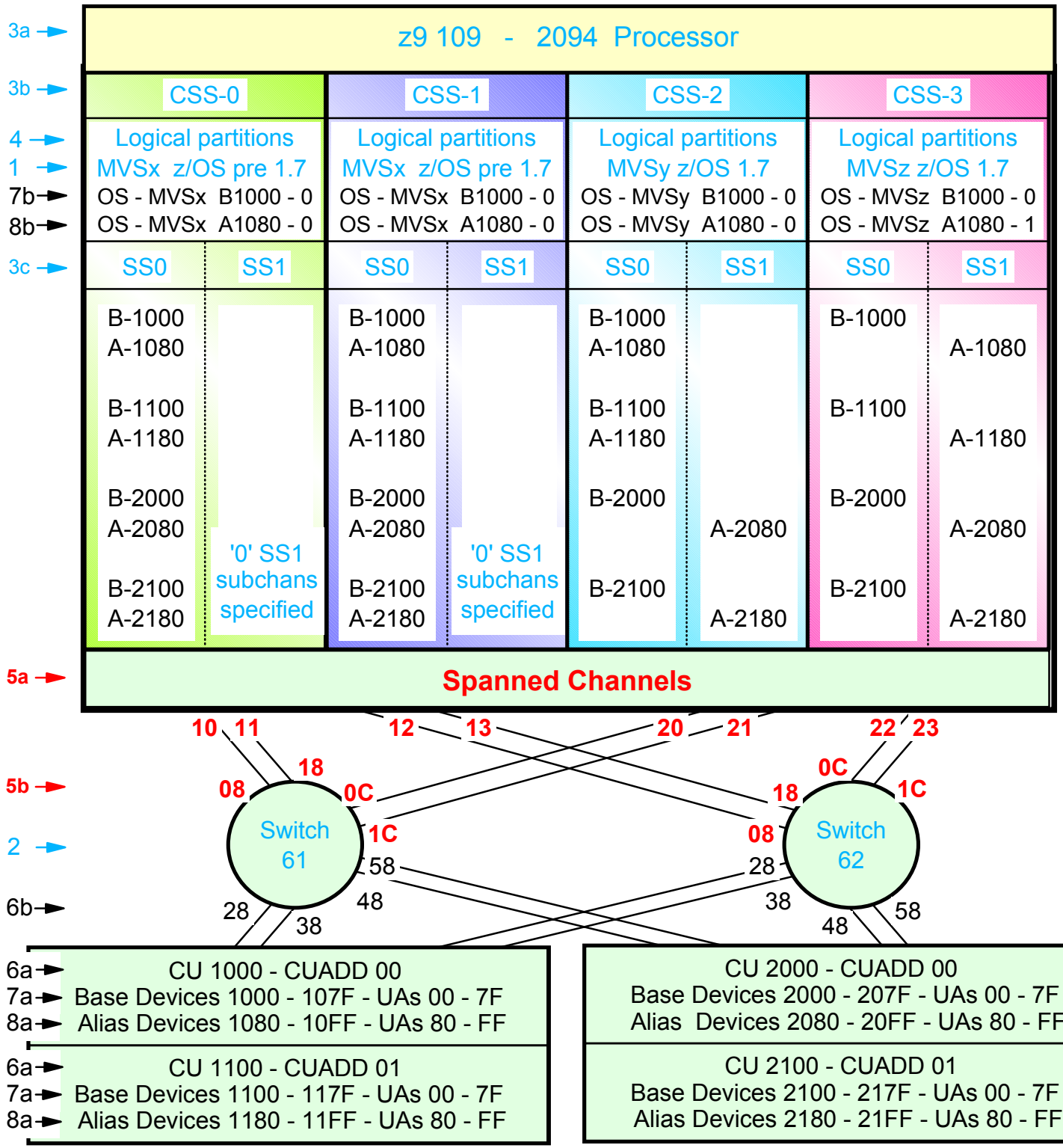
```
                              Partition List
  Goto  Backup  Query  Help
--------------------------------------------------------------------------------
                                                                    Row 1 of 6
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more partitions, then press Enter. To add, use F11.

Processor ID  . . . . : TEST2094
Configuration mode  . : LPAR
Channel Subsystem ID  : 2          LP mix of z/OS pre 1.7 and 1.7

/ Partition Name   Number Usage + Description
_ LPJ              4      OS      ________________________________
_ LPK              5      OS      ________________________________
_ LPL              6      OS      ________________________________
_ LPP              C      OS      ________________________________
_ *                8      OS      ________________________________
_ *                9      OS      ________________________________
**************************** Bottom of data ****************************
 F1=Help       F2=Split      F3=Exit       F4=Prompt     F5=Reset
 F7=Backward   F8=Forward    F9=Swap      F10=Actions    F11=Add
F12=Cancel    F13=Instruct  F22=Command
```

Display Processor Partitions: Logical Partitions for CSS-3

- Partitions being defined tor the processor CSS3 as per the system design
- Placeholder partitions, when defined, are shown in the partition list for the CSS

```
                              Partition List
  Goto  Backup  Query  Help
--------------------------------------------------------------------------------
                                                                    Row 1 of 4
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more partitions, then press Enter. To add, use F11.

Processor ID  . . . . : TEST2094
Configuration mode  . : LPAR
Channel Subsystem ID  : 3          All LPs will use z/OS 1.7

/ Partition Name   Number Usage + Description
_ LPS              1      OS      ________________________________
_ LPT              2      OS      ________________________________
_ LPU              3      OS      ________________________________
_ LPZ              6      OS      ________________________________
****************************** Bottom of data ******************************


 F1=Help       F2=Split      F3=Exit       F4=Prompt     F5=Reset
 F7=Backward   F8=Forward    F9=Swap      F10=Actions   F11=Add
F12=Cancel    F13=Instruct  F22=Command
```

IBM System z9 109 - 2094 - Configuration Definition Support - Processor CSS Channel - Definitions



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 instead of SS0
- This allows all the subchannels in SS0 to be used in support of additional Base DASD devices and other devices (non-DASD)
- z/OS 1.7 will support Alias devices defined in either SS0 or SS1 Alias
  - Note an alias device csn only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports alias devices that are defined in SS0
- An Alias devices can be defined in SS0 in one CSS and SS1 in another CSS
- This example shows Alias devices defined in SS0 for CSS0 and CSS1, and in SS1 for CSS2 and CSS3. Therefore z/OS pre 1.7 systems cannot run in CSS2 or CSS3 and still acess all the alias devices
- Note: This configuration definition will require one Processor definition (PROC.id) and three OSCONFIG definitions (MVSx, MVSy, MVSz)
  - z/OS pre 1.7 - OSCONFIG - MVSx
  - z/OS 1.7 OSCONFIG - MVSy or MVSz
- This configurstion definition approach can be used when migrating from z/OS pre 1.7 to z/OS 1.7 for paritions in CSS-0,1,2
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

z/OS V1.7 HCD - Main Definition Selection (option 13.s.s)

```
                Define, Modify, or View Configuration Data

    Select type of objects to define, modify, or view data.

     3_ 1. Operating system configurations
              consoles
              system-defined generics
              EDTs
                esoterics
                user-modified generics
        2. Switches
              ports
              switch configurations
                port matrix
        3. Processors
              channel subsystems
                partitions
                channel paths
        4. Control units
        5. I/O devices
F1=Help    F2=Split   F3=Exit    F9=Swap    F12=Cancel
```

Define Processor / CSS Channel Paths: CHPID (10-13)- PCHID - Type - Mode - Switch Connection

```
                          Add Channel Path


Specify or revise the following values.

Processor ID . . . . : TEST2094
Configuration mode . : LPAR
Channel Subsystem ID : 0            All LPs will use z/OS pre 1.7

Channel path ID  . . . . 10    +            PCHID . . . ___
Number of CHPIDs . . . . 4
Channel path type  . . . FC_   +
Operation mode . . . . . SPAN  +
Managed  . . . . . . . . no    (Yes or No)   I/O Cluster ________  +
Description  . . . . . . _____________________________________

Specify the following values only if connected to a switch:
Dynamic entry switch ID  61  + (00 - FF)
Entry switch ID  . . . . 61  +
Entry port . . . . . . . 08  +
```

- Normal channel path definition.
- The channels being defined will be used by all the Partitions accessing the DASD CUs therefore they are being defined as SPANNED
- PCHID information will be provided as a result of using the 2094 CMT

Define Processor / CSS Channel Path: CHPID (10-13) to Switch Connections

```
                Update CHPID Settings
                                                    Row 1 of 4
Command ===> ____________________ Scroll ===> PAGE

Specify or revise the following values.

Processor ID . . . . : TEST2094
Channel Subsystem ID : 0

              DynEntry  --Entry +--
CHPID  PCHID  Switch +  Switch Port
10      ___   61        61     08
11      ___   61        61     18
12      ___   62        62     08
13      ___   62        62     18
****************** Bottom of data ******************
```

- Provide the channel (CHPID) to switch connectivity information for all the CHPIDs in the defined group

Define Processor / CSS Channel Paths: CHPID (10-13) Logical Patition Access

```
                         Define Access List
                                                       Row 1 of 18
Command ===> ________________________________________ Scroll ===> PAGE

Select one or more partitions for inclusion in the access list.

Channel subsystem ID : 0      All LPs will use z/OS pre 1.7
Channel path ID . . : 10     Channel path type  . : FC
Operation mode . . . : SPAN   Number of CHPIDs . . : 4

/ CSS ID Partition Name   Number Usage Description
_ 0      LP1              1      OS
_ 0      LP2              2      OS
_ 0      LP3              3      OS
_ 0      LP8              8      OS
_ 1      LPA              1      OS
_ 1      LPB              2      OS
_ 1      LPC              3      OS
_ 1      LPD              4      OS
_ 1      LPE              5      OS
_ 1      LPF              8      OS

_ 2      LPJ              4      OS
_ 2      LPK              5      OS
_ 2      LPL              6      OS
_ 2      LPP              C      OS
_ 3      LPS              1      OS
_ 3      LPT              2      OS
_ 3      LPU              3      OS
_ 3      LPZ              6      OS
```

- For SPANED CHPIDs all partitions are shown from all CSSs in the Define ACCESS List panel (except placeholder partitions)
- Select the partitions that require access to the SPANED channels
- CHPIDs will remain defined as SPANED if 2 or more partitions from different CSSs are selected from the define access list

Define Processor / CSS Channel Paths: CHPID (2-23) - PCHID - Type - Mode - Switch Connection

```
                          Add Channel Path


Specify or revise the following values.

Processor ID . . . . : TEST2094
Configuration mode . : LPAR
Channel Subsystem ID : 0            All LPs will use z/OS pre 1.7

Channel path ID  . . . . 20    +            PCHID . . . ___
Number of CHPIDs . . . . 4
Channel path type  . . . FC_   +
Operation mode . . . . . SPAN  +
Managed  . . . . . . . . no    (Yes or No)   I/O Cluster ________  +
Description  . . . . . . _____________________________________

Specify the following values only if connected to a switch:
Dynamic entry switch ID  61  + (00 - FF)
Entry switch ID  . . . . 61  +
Entry port . . . . . . . 0C  +
```

- Normal channel path definition.
- The channels being defined will be used by all the Partitions accessing the DASD CUs therefore they are being defined as SPANED
- PCHID information will be provided as a result of using the 2094 CMT

Define Processor / CSS Channel Path: CHPID (20-23) to Switch Connections

```
                Update CHPID Settings
                                                  Row 1 of 4
Command ===> ____________________ Scroll ===> PAGE

Specify or revise the following values.

Processor ID . . . . : TEST2094
Channel Subsystem ID : 0

              DynEntry  --Entry +--
CHPID  PCHID  Switch +  Switch Port
20      ___   61        61     0C
21      ___   61        61     1C
22      ___   62        62     0C
23      ___   62        62     1C
****************** Bottom of data ******************
```

- Provide the channel (CHPID) to switch connectivity information for all the CHPIDs in the defined group

Define Processor / CSS Channel Paths: CHPID (20-23) Logical Patition Access

```
                              Define Access List
                                                                 Row 1 of 18
Command ===> _____________________________________________ Scroll ===> PAGE

Select one or more partitions for inclusion in the access list.

Channel subsystem ID : 0       All LPs will use z/OS pre 1.7
Channel path ID  . . : 20      Channel path type  . : FC
Operation mode . . . : SPAN    Number of CHPIDs . . : 4

/ CSS ID Partition Name   Number Usage Description
_ 0      LP1              1      OS
_ 0      LP2              2      OS
_ 0      LP3              3      OS
_ 0      LP8              8      OS
_ 1      LPA              1      OS
_ 1      LPB              2      OS
_ 1      LPC              3      OS
_ 1      LPD              4      OS
_ 1      LPE              5      OS
_ 1      LPF              8      OS
_ 2      LPJ              4      OS
_ 2      LPK              5      OS
_ 2      LPL              6      OS
_ 2      LPP              C      OS
_ 3      LPS              1      OS
_ 3      LPT              2      OS
_ 3      LPU              3      OS
_ 3      LPZ              6      OS
```

- For SPANNED CHPIDs all partitions are shown from all CSSs in the Define ACCESS List panel (except placeholder partitions)
- Select the partitions that require access to the SPANED channels
- CHPIDs will remain defined as SPANNED if 2 or more partitions from different CSSs are selected from the define access list

Display Processor / CSS Channel Paths: CSS-0 Channel Path List

```
                              Channel Path List       Row 1 of 8 More:       >
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more channel paths, then press Enter. To add use F11.

Processor ID . . . . : TEST2094
Configuration mode . : LPAR
Channel Subsystem ID : 0            All LPs will use z/OS pre 1.7

                     DynEntry Entry +
/ CHPID Type+ Mode+ Switch + Sw Port Con Mngd Description
_ 10    FC    SPAN  61       61 08       No   ____________________________
_ 11    FC    SPAN  61       61 18       No   ____________________________
_ 12    FC    SPAN  62       62 08       No   ____________________________
_ 13    FC    SPAN  62       62 18       No   ____________________________
_ 20    FC    SPAN  61       61 0C       No   ____________________________
_ 21    FC    SPAN  61       61 1C       No   ____________________________
_ 22    FC    SPAN  62       62 0C       No   ____________________________
_ 23    FC    SPAN  62       62 1C       No   ____________________________
```

- Use F19 or F20 to shift left/right to display which paritions in the 'partitions Nx' matrix can access the listed CHPIDs
- PCHID information will be provided as a result of using the 2094 CMT

Display Processor / CSS Channel Paths: CSS-0 Channel Path List - CSS-0 Partition Access

```
                                Channel Path List       Row 1 of 8 More: <     >
Command ===> _____________________________________________ Scroll ===> PAGE

Select one or more channel paths, then press Enter. To add, use F11.

Channel Subsystem ID : 0            All LPs will use z/OS pre 1.7
1=LP1        2=LP2        3=LP3       4=          5=
6=           7=*          8=LP8       9=          A=
B=           C=           D=          E=          F=
                           I/O Cluster  --------- Partitions 0x -----
/ CHPID Type+ Mode+ Mngd   Name +       1 2 3 4 5 6 7 8 9 A B C D E F   PCHID
_ 10    FC    SPAN  No     ________     a a a _ _ _ # a _ _ _ _ _ _ _   ___
_ 11    FC    SPAN  No     ________     a a a _ _ _ # a _ _ _ _ _ _ _   ___
_ 12    FC    SPAN  No     ________     a a a _ _ _ # a _ _ _ _ _ _ _   ___
_ 13    FC    SPAN  No     ________     a a a _ _ _ # a _ _ _ _ _ _ _   ___
_ 20    FC    SPAN  No     ________     a a a _ _ _ # a _ _ _ _ _ _ _   ___
_ 21    FC    SPAN  No     ________     a a a _ _ _ # a _ _ _ _ _ _ _   ___
_ 22    FC    SPAN  No     ________     a a a _ _ _ # a _ _ _ _ _ _ _   ___
_ 23    FC    SPAN  No     ________     a a a _ _ _ # a _ _ _ _ _ _ _   ___
```

- Use F19 or F20 to shift left/right to display which paritions in the 'partitions Nx' matrix can access the listed CHPIDs
- PCHID information will be provided as a result of using the 2094 CMT

Display Processor / CSS Channel Paths: CSS-0 Channel Path List - CSS-1 Partition Access

```
                                Channel Path List        Row 1 of 8 More: <     >
Command ===> ____________________________________________________ Scroll ===> PAGE

Select one or more channel paths, then press Enter. To add, use F11.

Channel Subsystem ID : 0              All LPs will use z/OS pre 1.7
1=LPA        2=LPB        3=LPC        4=LPD        5=LPE
6=*          7=*          8=LPF        9=           A=
B=           C=           D=           E=           F=
                            I/O Cluster  --------- Partitions 1x -----
/ CHPID Type+ Mode+ Mngd  Name +       1 2 3 4 5 6 7 8 9 A B C D E F   PCHID
_ 10    FC    SPAN  No    ________     a a a a a # # a _ _ _ _ _ _ _ _   ___
_ 11    FC    SPAN  No    ________     a a a a a # # a _ _ _ _ _ _ _ _   ___
_ 12    FC    SPAN  No    ________     a a a a a # # a _ _ _ _ _ _ _ _   ___
_ 13    FC    SPAN  No    ________     a a a a a # # a _ _ _ _ _ _ _ _   ___
_ 20    FC    SPAN  No    ________     a a a a a # # a _ _ _ _ _ _ _ _   ___
_ 21    FC    SPAN  No    ________     a a a a a # # a _ _ _ _ _ _ _ _   ___
_ 22    FC    SPAN  No    ________     a a a a a # # a _ _ _ _ _ _ _ _   ___
_ 23    FC    SPAN  No    ________     a a a a a # # a _ _ _ _ _ _ _ _   ___
```

- Use F19 or F20 to shift left/right to display which paritions in the 'Partitions Nx' matrix can access the CHPIDs shown in the channel path list
- PCHID information will be provided after migrating the 2094 CMT output

Display Processor / CSS Channel Paths: CSS-0 Channel Path List - CSS-2 Partition Access

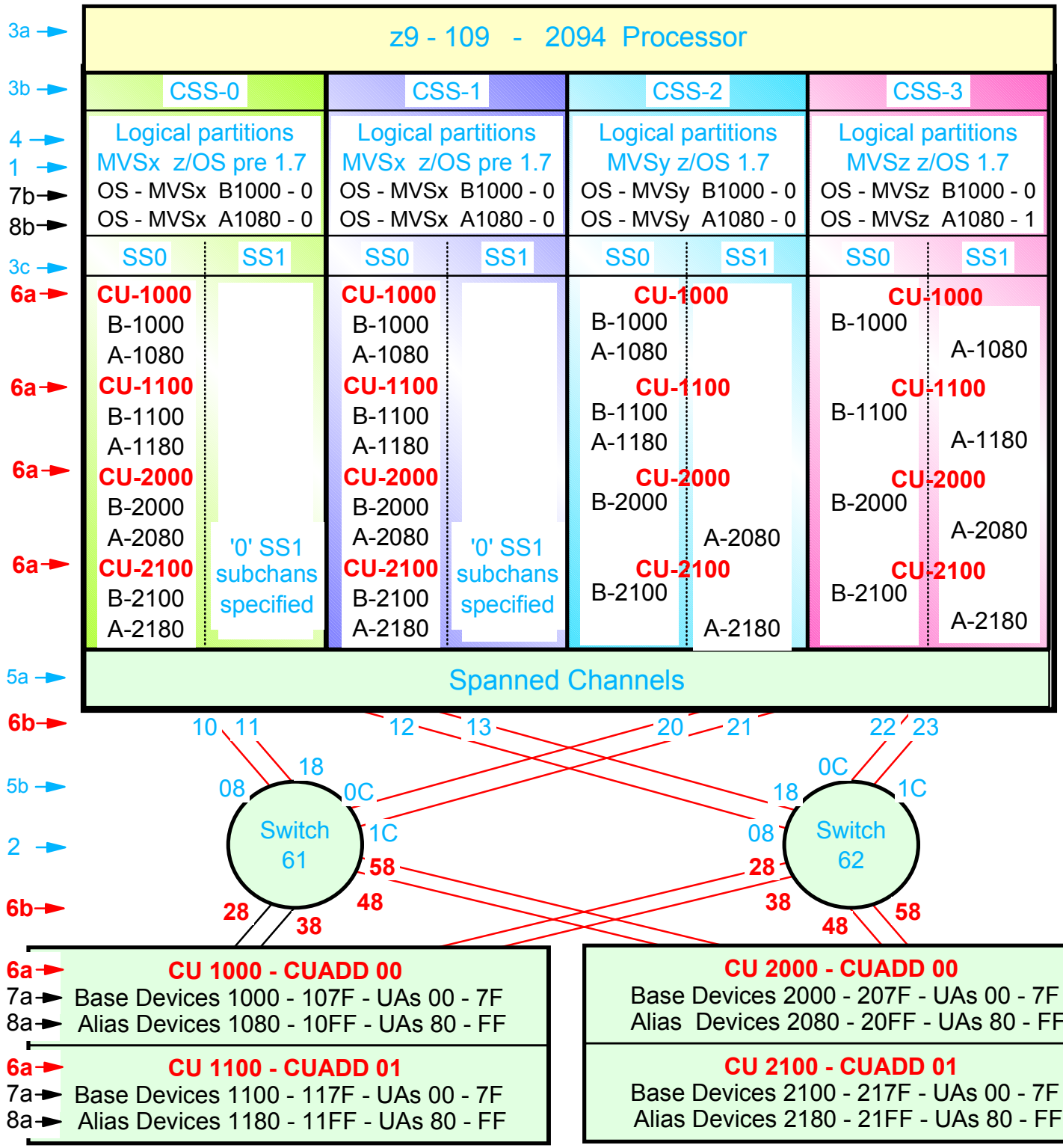
```
                                Channel Path List          Row 1 of 8 More: <     >
Command ===> ____________________________________________________ Scroll ===> PAGE

Select one or more channel paths, then press Enter. To add, use F11.

Channel Subsystem ID : 0              All LPs will use z/OS pre 1.7
1=            2=            3=            4=LPJ         5=LPK
6=LPL         7=            8=*           9=*           A=
B=            C=LPP         D=            E=            F=
                                I/O Cluster  --------- Partitions 2x -----
/ CHPID Type+ Mode+ Mngd  Name +        1 2 3 4 5 6 7 8 9 A B C D E F   PCHID
_ 10    FC    SPAN  No    ________      _ _ _ a a a _ # # _ _ a _ _ _   ___
_ 11    FC    SPAN  No    ________      _ _ _ a a a _ # # _ _ a _ _ _   ___
_ 12    FC    SPAN  No    ________      _ _ _ a a a _ # # _ _ a _ _ _   ___
_ 13    FC    SPAN  No    ________      _ _ _ a a a _ # # _ _ a _ _ _   ___
_ 20    FC    SPAN  No    ________      _ _ _ a a a _ # # _ _ a _ _ _   ___
_ 21    FC    SPAN  No    ________      _ _ _ a a a _ # # _ _ a _ _ _   ___
_ 22    FC    SPAN  No    ________      _ _ _ a a a _ # # _ _ a _ _ _   ___
_ 23    FC    SPAN  No    ________      _ _ _ a a a _ # # _ _ a _ _ _   ___
```

- Use F19 or F20 to shift left/right to display which paritions in the 'Partitions Nx' matrix can access the CHPIDs shown in the channel path list
- PCHID information will be provided after migrating the 2094 CMT output

Display Processor / CSS Channel Paths: CSS-0 Channel Path List - CSS-3 Partition Access

```
                                Channel Path List          Row 1 of 8 More: <
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more channel paths, then press Enter. To add, use F11.

Channel Subsystem ID : 0              All LPs will use z/OS pre 1.7
1=LPS        2=LPT        3=LPU        4=           5=
6=LPZ        7=           8=           9=           A=
B=           C=           D=           E=           F=
                           I/O Cluster  --------- Partitions 3x -----
/ CHPID Type+ Mode+ Mngd   Name +       1 2 3 4 5 6 7 8 9 A B C D E F   PCHID
_ 10    FC    SPAN  No     ________     a a a _ _ a _ _ _ _ _ _ _ _ _   ___
_ 11    FC    SPAN  No     ________     a a a _ _ a _ _ _ _ _ _ _ _ _   ___
_ 12    FC    SPAN  No     ________     a a a _ _ a _ _ _ _ _ _ _ _ _   ___
_ 13    FC    SPAN  No     ________     a a a _ _ a _ _ _ _ _ _ _ _ _   ___
_ 20    FC    SPAN  No     ________     a a a _ _ a _ _ _ _ _ _ _ _ _   ___
_ 21    FC    SPAN  No     ________     a a a _ _ a _ _ _ _ _ _ _ _ _   ___
_ 22    FC    SPAN  No     ________     a a a _ _ a _ _ _ _ _ _ _ _ _   ___
_ 23    FC    SPAN  No     ________     a a a _ _ a _ _ _ _ _ _ _ _ _   ___
```

- Use F19 or F20 to shift left/right to display which paritions in the 'partitions Nx' matrix can access the listed CHPIDs
- PCHID information will be provided as a result of using the 2094 CMT



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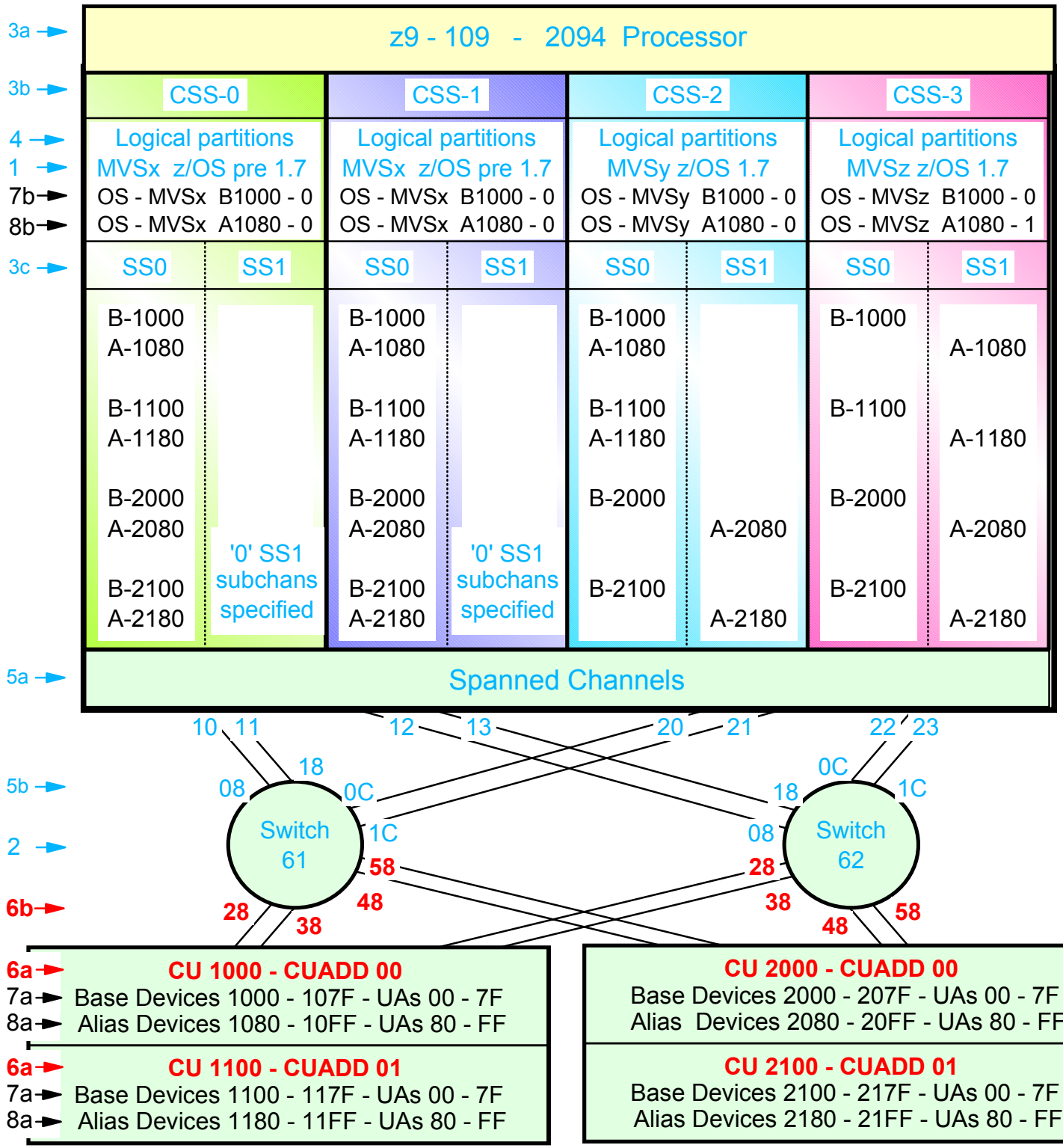
- Note: This configuration definition will require one Processor definition (PROC.id) and three OSCONFIG definitions (MVSx, MVSy, MVSz)
  - z/OS pre 1.7 - OSCONFIG - MVSx
  - z/OS 1.7 OSCONFIG - MVSy or MVSz
- This configurstion definition approach can be used when migrating from z/OS pre 1.7 to z/OS 1.7 for paritions in CSS-0,1,2
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS



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z/OS V1.7 HCD - Main Definition Selection (option 1.4)

```
                Define, Modify, or View Configuration Data

   Select type of objects to define, modify, or view data.

    4  1. Operating system configurations
                consoles
                system-defined generics
                EDTs
                  esoterics
                  user-modified generics
         2. Switches
                ports
                switch configurations
                  port matrix
         3. Processors
                channel subsystems
                  partitions
                  channel paths
         4. Control units
         5. I/O devices
F1=Help    F2=Split   F3=Exit    F9=Swap    F12=Cancel
```

Define CU 1000, and CU to switch connections

```
                        Add Control Unit


Specify or revise the following values.

Control unit number  . . . : 1000

Control unit type  . . . . . 2105          +

Serial number  . . . . . . . _________
Description  . . . . . . . . ____________________________________

Connected to switches  . . . 61  61  62  62  __  __  __  __  +
Ports  . . . . . . . . . . . 28  38  28  38  __  __  __  __  +


If connected to a switch:

Define more than eight ports . . 2   1.  Yes
                                     2.  No
```

- Define the CU number, Unit Type and CU to switch connectivity if a switched point-to-point CU connectiont

Define CU 1000 - Processor / CSS channel path to CU - CHPID and Destition Link (Port)

```
                              Select Processor / CU     Row 1 of 4 More:       >
Command ===> _____________________________________________ Scroll ===> PAGE

Select processors to change CU/processor parameters, then press Enter.

Control unit number . . : 1000     Control unit type . . . : 2105

              ---------------Channel Path ID . Link Address + ---------------
/ Proc.CSSID 1------ 2------ 3------ 4------ 5------ 6------ 7------ 8------
_ TEST2094.0 10.28__ 11.38__ 12.28__ 13.38__ _______ _______ _______ _______
_ TEST2094.1 10.28__ 11.38__ 12.28__ 13.38__ _______ _______ _______ _______
_ TEST2094.2 10.28__ 11.38__ 12.28__ 13.38__ _______ _______ _______ _______
_ TEST2094.3 10.28__ 11.38__ 12.28__ 13.38__ _______ _______ _______ _______
******************************* Bottom of data ********************************
```

- Define the CSS-to-CU logical path connectivity (CUADD CHPID Link Address - Port Address) for each CSS that will access the CU. For a FICON Cascade Switch connection path you must use a 2-byte link address
- This example is for FICON switched point-to-point (i.e. non-cascade switch)

Define CU 1000 - Processor / CSS CUADD (CUI), CU Unit Address, CU Unit Address range

```
                              Select Processor / CU     Row 1 of 4 More: <     >
Command ===> _____________________________________________ Scroll ===> PAGE

Select processors to change CU/processor parameters, then press Enter.

Control unit number . . : 1000     Control unit type . . . : 2105

                  CU   --------------Unit Address . Unit Range + -------------
/ Proc.CSSID Att ADD+ 1----- 2----- 3----- 4----- 5----- 6----- 7----- 8-----
_ TEST2094.0 Yes 0_   00.256 ______ ______ ______ ______ ______ ______ ______
_ TEST2094.1 Yes 0_   00.256 ______ ______ ______ ______ ______ ______ ______
_ TEST2094.2 Yes 0_   00.256 ______ ______ ______ ______ ______ ______ ______
_ TEST2094.3 Yes 0_   00.256 ______ ______ ______ ______ ______ ______ ______
******************************* Bottom of data ********************************
```

- Define CU Unit Address and Unit Address range for each CSS that requires to access the CU

Display IODF CU list - CU #, Type, # of CSSs defined to access, # Managed Channel Paths

```
                              Control Unit List                        Row 1 of 3
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more control units, then press Enter.  To add, use F11.

/ CU   Type +        #CSS #MC Serial-# + Description
_ 0061 2032                   __________ ____________________________________
_ 0062 2032                   __________ ____________________________________
_ 1000 2105          4        __________ ____________________________________
****************************** Bottom of data ********************************
```

- So far the CU has beeen defined to the required processor(s) and CSS(s). As a double check, check that the CU is defined to the required number of CSSs.

Display IODF CU list - CU #, Type, # of CSSs defined to access, # Managed Channel Paths

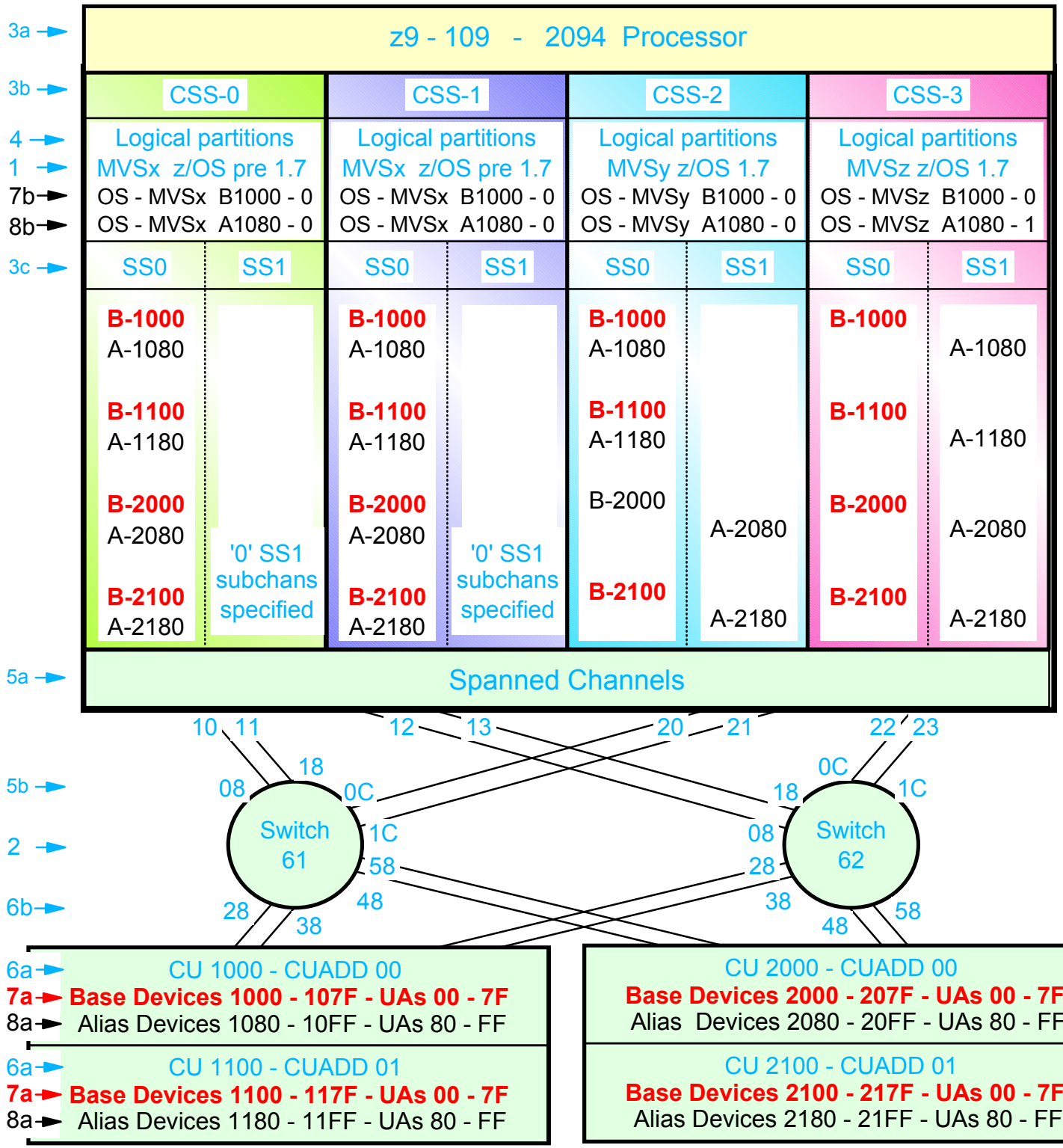
```
                                Control Unit List                          Row 1 of 6
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more control units, then press Enter.  To add, use F11.

/ CU   Type +        #CSS #MC Serial-# + Description
_ 0061 2032                   __________ ________________________________
_ 0062 2032                   __________ ________________________________
_ 1000 2105          4        __________ ________________________________
_ 1100 2105          4        __________ ________________________________
_ 2000 2105          4        __________ ________________________________
_ 2100 2105          4        __________ ________________________________
****************************** Bottom of data ********************************
```

- Define the other logical CU in the configuration, and as a double check, check that each CU is defined to the required number of CSSs.

IBM System z9 109 - 2094 - Configuration Definition Support - CU Base Device (DASD) - Definitions



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- Note: This configuration definition will require one Processor definition (PROC.id) and three OSCONFIG definitions (MVSx, MVSy, MVSz)
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  - z/OS 1.7 OSCONFIG - MVSy or MVSz
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z/OS V1.7 HCD - Main Definition Selection (option 1.5 or 1.4.s)

```
                Define, Modify, or View Configuration Data

    Select type of objects to define, modify, or view data.

     5  1. Operating system configurations
              consoles
              system-defined generics
              EDTs
                esoterics
                user-modified generics
        2. Switches
              ports
              switch configurations
                port matrix
        3. Processors
              channel subsystems
                partitions
                channel paths
        4. Control units
        5. I/O devices
  F1=Help    F2=Split   F3=Exit    F9=Swap   F12=Cancel
```

Define Base Device(s) to: Processor / CSS(s) - CU 1000 and OSCONFIG(s)

```
                                Control Unit List                          Row 1 of 6
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more control units, then press Enter.  To add, use F11.

/ CU   Type +        #CSS #MC Serial-# + Description
_ 0061 2032                   __________ ________________________________________
_ 0062 2032                   __________ ________________________________________
S 1000 2105          4        __________ ________________________________________
_ 1100 2105          4        __________ ________________________________________
_ 2000 2105          4        __________ ________________________________________
_ 2100 2105          4        __________ ________________________________________
******************************* Bottom of data ********************************
```

- Proceed to define the Base devices to the to the CUs. Following the sequence shown in this presentation will allow you to also to define the devices the the required processors/logical partitions, the required Subchannel Sets, and at a later stage to the required OSCONFIGs

Define Base Device(s) to: Processor / CSS(s) - CU 1000 and OSCONFIG(s)

```
  Goto  Filter  Backup  Query  Help
--------------------------------------------------------------------------------
                              I/O Device List
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more devices, then press Enter. To add, use F11.

Control unit number  : 1000     Control unit type  . : 2105

  ----------Device------ --#--- --------Control Unit Numbers + --------
/ Number   Type +        CSS OS 1--- 2--- 3--- 4--- 5--- 6--- 7--- 8---
******************************* Bottom of data ********************************
```

- The panel shows there is currently no devices defned to this CU. Use F11 to add devices to the CU

Define Base Device(s) to: Processor / CSS(s) - CU 1000 and OSCONFIG(s)

```
                                Add Device


Specify or revise the following values.

Device number  . . . . . . . . . 1000  + (0000 - FFFF)
Number of devices  . . . . . . . 128_
Device type  . . . . . . . . . . 3390B_______  +

Serial number  . . . . . . . . . __________
Description  . . . . . . . . . . ________________________________

Volume serial number . . . . . . ______  (for DASD)

Connected to CUs . . 1000  ____  ____  ____  ____  ____  ____  ____  +
```

- Define the 1000 device number for 128 devices, and define them as 3390B (Base Devices)

Define Base Device(s) to: Processor / CSS(s) - CU 1000 and OSCONFIG(s)

```
                          Device / Processor Definition
                                                                  Row 1 of 4
Command ===> ____________________________________________ Scroll ===> PAGE

Select processors to change device/processor definitions, then press
Enter.

Device number  . . : 1000        Number of devices  . : 128
Device type  . . . : 3390B

                                                Preferred  Device Candidate List
/ Proc.CSSID  SS+  UA+  Time-Out  STADET  CHPID +    Explicit        Null
_ TEST2094.0  _    __   No        Yes     __         No              ___
_ TEST2094.1  _    __   No        Yes     __         No              ___
_ TEST2094.2  _    __   No        Yes     __         No              ___
_ TEST2094.3  _    __   No        Yes     __         No              ___
****************************** Bottom of data ******************************
```

- There is ALWAYS a need to understand that device definition requirements on this panel.
  - Which CSS
  - Which Subchannel set
  - Unit address
  - Device candidate list
    - Explicit / Null

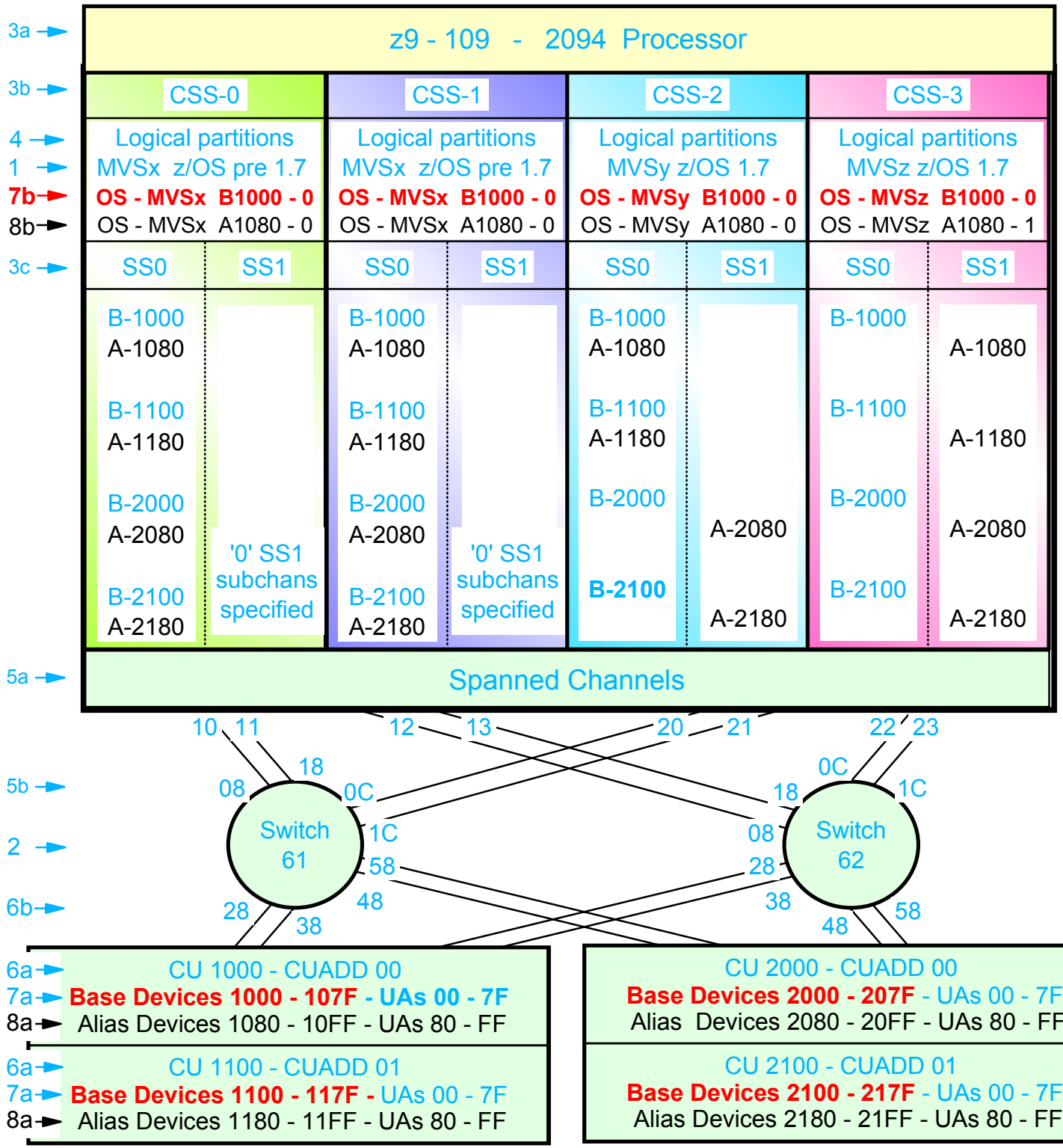
Define Base Device(s) to: Processor / CSS(s) - CU 1000 and OSCONFIG(s)

```
                        Device / Processor Definition
                                                                  Row 1 of 4
Command ===> _____________________________________________ Scroll ===> PAGE

Select processors to change device/processor definitions, then press
Enter.

Device number  . . : 1000        Number of devices  . : 128
Device type  . . . : 3390B

                                                 Preferred  Device Candidate List
/ Proc.CSSID  SS+  UA+  Time-Out  STADET  CHPID +    Explicit        Null
_ TEST2094.0  _    __   No        Yes     __         No              ___
_ TEST2094.1  _    __   No        Yes     __         No              ___
_ TEST2094.2  _    __   No        Yes     __         No              ___
_ TEST2094.3  _    __   No        Yes     __         No              ___
```

- There is a need to understand the meaning of some of the selection options on this panel
  - SS (Subhannel Set) - in which Subchannel Set the device may be / will be defined - use promt (F4) to show allowed SSs
  - Explicit - Device Candidate List - provides selection as to which partitions may access the device
  - Null - Device Candidate List - if explicit is selected and no partitions then this is a Null candidate list for the Processor/CSS

```
            Available Subchannel Set IDs
                                          Row 1 of 1
  Command ===> ___________________________________

  Select one.
      Subchannel Set ID
    0
```

IBM System z9 109 - 2094 - Configuration Definition Support - OSCONFIG Base Device (DASD) - Definitions



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Define Base Device(s) to: Processor / CSS(s) - CU 1000 and OSCONFIG(s)

```
           Define Device to Operating System Configuration
                                                              Row 1 of 3
Command ===> _____________________________________ Scroll ===> PAGE

Select OSs to connect or disconnect devices, then press Enter.

Device number  . : 1000           Number of devices  : 128
Device type  . . : 3390B

/ Config. ID   Type     SS Description                        Defined
  MVSX         MVS
  MVSY         MVS
  MVSZ         MVS
************************** Bottom of data ***************************
```

- Using the sequence shown in these foils, once having defined the device to the CU, proccessor / CSS / Partitions, the next action is to define the device(s) to the required OSCONFIGs

Define Base Device(s) to OSCONFIG MVSX

```
                    Define Device Parameters / Features
                                                                  Row 1 of 6
Command ===> ____________________________________________ Scroll ===> PAGE

Specify or revise the values below.

Configuration ID . : MVSX
Device number  . . : 1000          Number of devices  : 128
Device type  . . . : 3390B

Parameter/
Feature    Value +           R Description
OFFLINE    No                  Device considered online or offline at IPL
DYNAMIC    Yes                 Device supports dynamic configuration
LOCANY     No                  UCB can reside in 31 bit storage
WLMPAV     Yes                 Device supports work load manager
SHARED     Yes                 Device shared with other systems
SHAREDUP   No                  Shared when system physically partitioned
****************************** Bottom of data ********************************
```

- Defining the DASD to OSCONFIG MVSx
- Being a Base DASD device (or another way to express this is a - non Alias Device) the defnition process will define the UCB device to reside as a Subchannel Set 0 subchannel

Define Base Device(s) to OSCONFIG MVSX

```
                    Assign/Unassign Device to Esoteric
                                                                  Row 1 of 2
Command ===> ____________________________________________ Scroll ===> PAGE

Specify Yes to assign or No to unassign.  To view devices already
assigned to esoteric, select and press Enter.

Configuration ID : MVSX
Device number  . : 1000              Number of devices  : 128
Device type  . . : 3390B             Generic  . . . . . : 3390

/ EDT.Esoteric  Assigned  Starting Number Number of Devices
_ 01.DASD       No        1000           8___
_ 01.SYSDA      No        1000           8___
****************************** Bottom of data ******************************
```

- Define the Devices to the required Esoterics

I/O Device 1000 for 128 (3390B) defined to OSCONFIG.ids - MVSX, MVSY, MVSZ

```
            Define Device to Operating System Configuration
                                                                Row 1 of 3
Command ===> _____________________________________ Scroll ===> PAGE

Select OSs to connect or disconnect devices, then press Enter.

Device number  . : 1000           Number of devices  : 128
Device type  . . : 3390B

/ Config. ID   Type     SS Description                        Defined
_ MVSX         MVS                                           Yes
_ MVSY         MVS                                           Yes
_ MVSZ         MVS                                           Yes
************************ Bottom of data ***************************
```

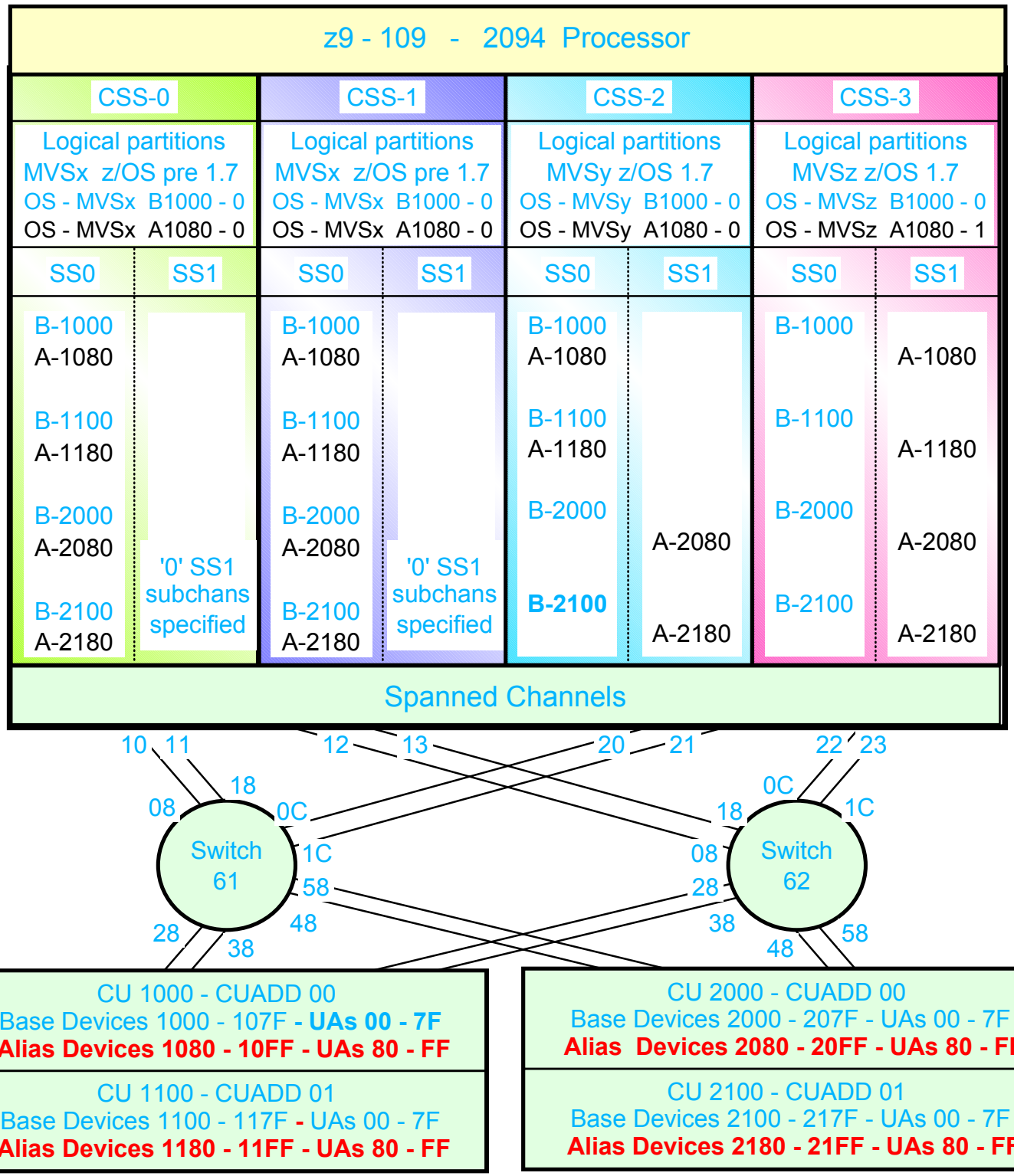
- Continue to define the devices to the other required OSCONFIGs. As a double check, check that the devices are defined to the required OCCONFIGs

I/O Device 1000 for 128 (3390B) defined to CU 1000 and OSCONFIG.ids - MVSX, MVSY, MVSZ

```
                              I/O Device List          Row 1 of 1 More:       >
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more devices, then press Enter. To add, use F11.

Control unit number  : 1000     Control unit type  . : 2105

  ----------Device------ --#--- --------Control Unit Numbers + --------
/ Number   Type +        CSS OS 1--- 2--- 3--- 4--- 5--- 6--- 7--- 8---
_ 1000,128 3390B         4   3  1000 ____ ____ ____ ____ ____ ____ ____
****************************** Bottom of data ********************************
```

- For this configuration definition, device 1000,128 is now defined to 4 CSSs and 3 OSCONFIGs
- Continue to define the other base devices to thier logical CUs as per the required configuration design

IBM System z9 109 - 2094 - Configuration Definition Support - CU Alias Device (DASD) - Definitions



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z/OS V1.7 HCD - Main Definition Selection (option 1.5 or 1.4.s

```
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              consoles
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              channel subsystems
                partitions
                channel paths
        4. Control units
        5. I/O devices
  F1=Help    F2=Split   F3=Exit    F9=Swap   F12=Cancel
```

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 and - OSCONFIG(s)

```
                                Control Unit List                       Row 1 of 6
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more control units, then press Enter.  To add, use F11.

/ CU   Type +        #CSS #MC Serial-# + Description
_ 0061 2032                   __________ ________________________________
_ 0062 2032                   __________ ________________________________
S 1000 2105          4        __________ ________________________________
_ 1100 2105          4        __________ ________________________________
_ 2000 2105          4        __________ ________________________________
_ 2100 2105          4        __________ ________________________________
******************************* Bottom of data ********************************
```

- Proceed to define the Alias devices to the to the CUs. Following the sequence shown in this presentation will allow you to also to define the devices the the required processors/logical partitions, the required Subchannel Sets, and at a later stage to the required OSCONFIGs

Base I/O Device 1000 for 128 (3390B) defined to OSCONFIG.ids - MVSX, MVSY, MVSZ
Alias I/O Device 1080 for 128 (3390B) to be defined to OSCONFIG.ids - MVSX, MVSY, MVSZ

```
                              I/O Device List          Row 1 of 1 More:       >
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more devices, then press Enter. To add, use F11.

Control unit number  : 1000     Control unit type  . : 2105

  ----------Device------ --#--- --------Control Unit Numbers + --------
/ Number   Type +        CSS OS 1--- 2--- 3--- 4--- 5--- 6--- 7--- 8---
_ 1000,128 3390B         4   3  1000 ____ ____ ____ ____ ____ ____ ____
******************************* Bottom of data ********************************
```

- The panel shows that the Base devices are currently defned to this CU. Use F11 to add the Alias devices to the CU

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

Add Device

Specify or revise the following values.

```
Device number  . . . . . 1080  + (0000 - FFFF)
Number of devices  . . . . . 128_
Device type  . . . . . 3390A_______  +

Serial number  . . . . . __________
Description  . . . . . ________________________________

Volume serial number . . . . . ______  (for DASD)

Connected to CUs . . 1000  ____  ____  ____  ____  ____  ____  ____  +
```

- Define the 3390 Alias devices to CU 1000

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
                        Device / Processor Definition
                                                                  Row 1 of 4
Command ===> ____________________________________________ Scroll ===> PAGE

Select processors to change device/processor definitions, then press
Enter.

Device number  . . : 1080        Number of devices  . : 128
Device type  . . . : 3390A

                                                 Preferred  Device Candidate List
/ Proc.CSSID  SS+  UA+  Time-Out  STADET  CHPID +    Explicit        Null
_ TEST2094.0  0    __   No        Yes     __         No              ___
_ TEST2094.1  0    __   No        Yes     __         No              ___
_ TEST2094.2  1    __   No        Yes     __         No              ___
_ TEST2094.3  1    __   No        Yes     __         No              ___
****************************** Bottom of data ********************************
  F1=Help       F2=Split       F3=Exit        F4=Prompt      F5=Reset
 F6=Previous   F7=Backward    F8=Forward     F9=Swap        F12=Cancel
F22=Command
```

F4 (Prompt) →

- There is a need to understand the meaning of some of the selection options on this panel
  - SS (Subhannel Set) - in which CSS / Subchannel Set the device may be / will be defined - use promt (F4) to show allowed SSs
  - Explicit - Device Candidate List - provides selection as to which partitions may access the device
  - Null - Device Candidate List - if explicit is selected and no partitions, then this is a Null candidate list for the Processor/CSS
  - device 1080 can only be placed in SS-0 of TEST2094 CSS-0 because there is a 0 numbers of subchannels defined in SS-0

```
                    Available Subchannel Set IDs
                 Select one.
                 Subchannel Set ID
                0
```

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
                        Device / Processor Definition
                                                                  Row 1 of 4
Command ===> _____________________________________________ Scroll ===> PAGE

Select processors to change device/processor definitions, then press
Enter.

Device number  . . : 1080        Number of devices  . : 128
Device type  . . . : 3390A
                                          Preferred  Device Candidate List
/ Proc.CSSID  SS+  UA+  Time-Out  STADET  CHPID +    Explicit        Null
_ TEST2094.0  0    __   No        Yes     __         No              ___
_ TEST2094.1  0    __   No        Yes     __         No              ___
_ TEST2094.2  0    80   No        Yes     __         No              ___
_ TEST2094.3  1    __   No        Yes     __         No              ___
****************************** Bottom of data ******************************
  F1=Help       F2=Split      F3=Exit       F4=Prompt     F5=Reset
 F6=Previous   F7=Backward   F8=Forward    F9=Swap       F12=Cancel
F22=Command
```

F4 (Prompt)

- There is a need to understand the meaning of some of the selection options on this panel
  - SS (Subhannel Set) - in which CSS / Subchannel Set the device may be / will be defined - use promt (F4) to show allowed SSs
  - Explicit - Device Candidate List - provides selection as to which partitions may access the device
  - Null - Device Candidate List - if explicit is selected and no partitions, then this is a Null candidate list for the Processor/CSS
  - device 1080 can be placed in SS-0 or 1 of TEST2094 CSS-2 because thereare a number of subchannels defined in SS-1

```
                    Available Subchannel Set IDs
                  Select one.
                  Subchannel Set ID
                0
                1
```

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

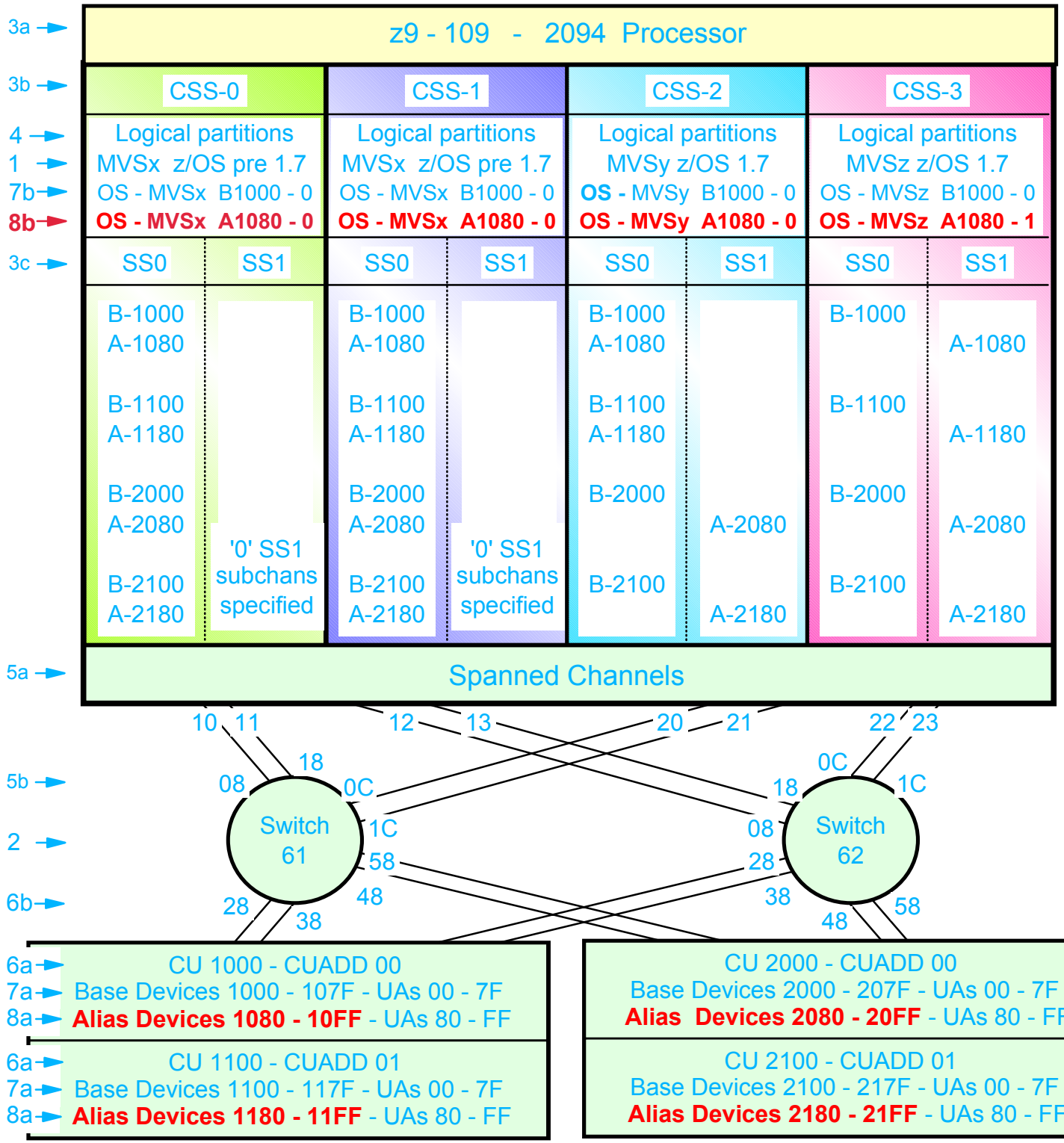
```
                        Device / Processor Definition
                                                                  Row 1 of 4
Command ===> _____________________________________________ Scroll ===> PAGE

Select processors to change device/processor definitions, then press
Enter.

Device number  . . : 1080        Number of devices  . : 128
Device type  . . . : 3390A
                                          Preferred  Device Candidate List
/ Proc.CSSID  SS+  UA+  Time-Out  STADET  CHPID +    Explicit        Null
_ TEST2094.0  0    __   No        Yes     __         No              ___
_ TEST2094.1  0    __   No        Yes     __         No              ___
_ TEST2094.2  1    __   No        Yes     __         No              ___
_ TEST2094.3  1    __   No        Yes     __         No              ___
****************************** Bottom of data ******************************
  F1=Help       F2=Split      F3=Exit       F4=Prompt     F5=Reset
 F6=Previous   F7=Backward   F8=Forward    F9=Swap       F12=Cancel
F22=Command
```

F4 (Prompt)

- There is a need to understand the meaning of some of the selection options on this panel
  - SS (Subhannel Set) - in which CSS / Subchannel Set the device may be / will be defined - use promt (F4) to show allowed SSs
  - Explicit - Device Candidate List - provides selection as to which partitions may access the device
  - Null - Device Candidate List - if explicit is selected and no partitions, then this is a Null candidate list for the Processor/CSS
  - device 1080 can be placed in SS-0 or 1 of TEST2094 CSS-2 because thereare a number of subchannels defined in SS-1

```
                    Available Subchannel Set IDs
                  Select one.
                  Subchannel Set ID
                0
                1
```

IBM System z9 109 - 2094 - Configuration Definition Support - OSCONFIG Alias Device - Definitions



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 instead of SS0
- This allows all the subchannels in SS0 to be used in support of Base DASD devices and other devices (non-DASD)
- z/OS 1.7 will support Alias devices defined in either SS0 or SS1 Alias
  - Note an alias device csn only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports alias devices that are defined in SS0
- An Alias devices can be defined in SS0 in one CSS and SS1 in another CSS
- This example shows Alias devices defined in SS0 in CSS0 and CSS1, and in SS1 in CSS2 and CSS3. Therefore z/OS pre 1.7 systems cannot run in CSS2 or CSS3 and acess the alias devices
- Note: This configuration will require one Processor definition (PROC.id) and three MVS definitions (MVS.id)
  - z/OS pre 1.7
    - OSCONFIG - MVSX
  - z/OS 1.7
    - OSCONFIG - MVSY or MVSZ
- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

Define Device(s) to CU(s) - Processor / CSS - OSCONFIG(s)

```
          Define Device to Operating System Configuration
                                                              Row 1 of 3
Command ===> _____________________________________ Scroll ===> PAGE

Select OSs to connect or disconnect devices, then press Enter.

Device number  . : 1080           Number of devices  : 128
Device type  . . : 3390A

/ Config. ID   Type     SS Description                      Defined
  MVSX         MVS
  MVSY         MVS
  MVSZ         MVS
************************** Bottom of data ***************************
```

- For each OSCONFIG, make swure There is a need to

Define Device(s) to CU(s) - Processor / CSS - OSCONFIG MVSX

```
        Define Device to Operating System Configuration

                    Specify Subchannel Set ID


Specify the ID of the subchannel set into which devices are placed,
then press Enter.

Configuration ID . : MVSX
Device number  . . : 1080           Number of devices  : 128
Device type  . . . : 3390A

Subchannel Set ID    1  +

 F1=Help    F2=Split   F3=Exit    F4=Prompt  F5=Reset   F9=Swap
F12=Cancel
```

- For each OSCONFIG, make swure that the correct subchannel set is specified for the Alias device(s) based on which logical partition the OSCONFIG will be used in

I/O Device 1000 for 128 (3390B) defined to OSCONFIG.ids - MVSX, MVSY, MVSZ

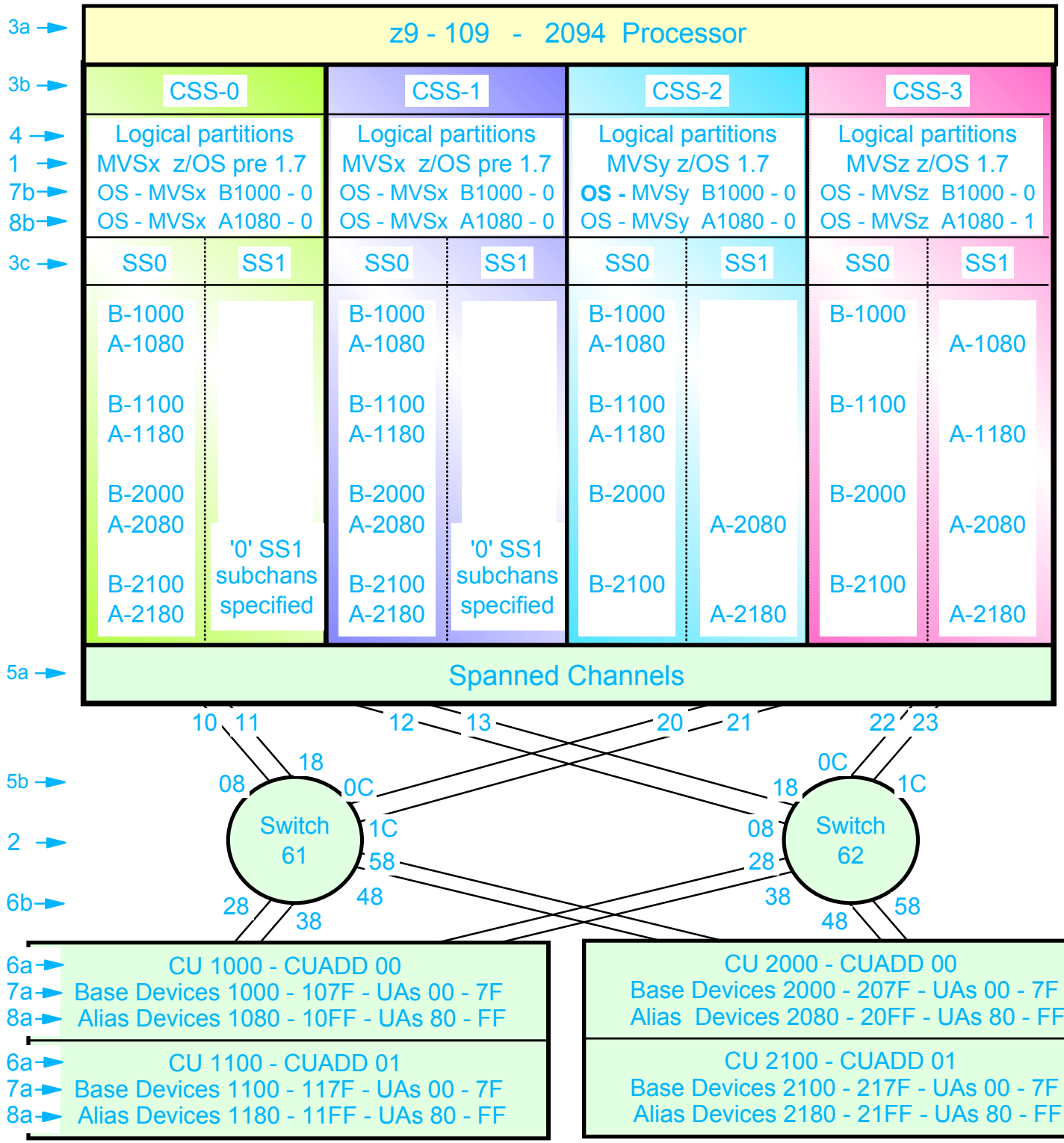
```
          Define Device to Operating System Configuration
                                                              Row 1 of 3
Command ===> _____________________________________ Scroll ===> PAGE

Select OSs to connect or disconnect devices, then press Enter.

Device number  . : 1080           Number of devices  : 128
Device type  . . : 3390A

/ Config. ID   Type     SS Description                      Defined
_ MVSX         MVS                                         Yes
_ MVSY         MVS                                         Yes
_ MVSZ         MVS                                         Yes
************************ Bottom of data ***************************
```

I/O Device 1000 for 128 (3390B) defined to OSCONFIG.ids - MVSX, MVSY, MVSZ

```
                              I/O Device List          Row 1 of 1 More:       >
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more devices, then press Enter. To add, use F11.

Control unit number  : 1080     Control unit type  . : 2105

  ----------Device------ --#--- --------Control Unit Numbers + --------
/ Number    Type +        CSS OS 1--- 2--- 3--- 4--- 5--- 6--- 7--- 8---
_ 1080,128 3390A          4   3  1000 ____ ____ ____ ____ ____ ____ ____
******************************* Bottom of data ********************************
```

- For this configuration definition, device 1080,128 is now defined to 4 CSSs and 3 OSCONFIGs
  - Warning: although its defined to 4 CSSs and 3 OSCONFIGs, irs not defined the same way in each CSS and OSCONFIG
- Continue to define the other base devices to thier logical CUs as per the required configuration design

IBM System z9 109 - 2094 - Configuration Definition Support - Processor / OSCONFIG - Complete



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 instead of SS0
- This allows all the subchannels in SS0 to be used in support of Base DASD devices and other devices (non-DASD)
- z/OS 1.7 will support Alias devices defined in either SS0 or SS1 Alias
  - Note an alias device csn only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports alias devices that are defined in SS0
- An Alias devices can be defined in SS0 in one CSS and SS1 in another CSS
- This example shows Alias devices defined in SS0 in CSS0 and CSS1, and in SS1 in CSS2 and CSS3. Therefore z/OS pre 1.7 systems cannot run in CSS2 or CSS3 and acess the alias devices
- Note: This configuration will require one Processor definition (PROC.id) and three MVS definitions (MVS.id)
  - z/OS pre 1.7
    - OSCONFIG - MVSX
  - z/OS 1.7
    - OSCONFIG - MVSY or MVSZ
- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

IBM System z9 109 - 2094
I/O Configuration Support - Installation
Subchannel Sets -
Alias Device Support, 2094 and z/OS
End of Presentation - Part 2

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

IBM System z9 109 - 2094
I/O Configuration Support
Base - Alias Subchanel Support
z/OS 1.7 Definition Demonstration
Presentation Part 3

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

- The Base / Alais I/O device definition demonstration will used a previouly defined I/O configuration ('TROWELL.IODF8F') for:
  - OSCONFIGs
    - MVSX
    - MVSY
    - MVSZ
  - The 2 switches
  - 2094 processor
    - 4 x CSSs
      - CCS 0 and CSS 1 - MSS 0 only
      - CSS 2 and CSS 3 - each have an MSS 0 and 1
    - Partitions in each CSS has its partitions defined
    - Channels defined to esch CSS
    - All the logical CUs are defined
- The following devices are not defined, but will be defined during the demostration
  - Device numbers 1000,128 - 3390B
    - Defined to all CSSs and defined in MSS 0
  - Device numbers 1080,128 - 3390A
    - Defined to CSS0 and CSS 1 in MSS 0
    - Defined to CSS2 and CSS 3 in MSS 1
    - Defined to CSS3 in MSS 1 as Alias device number 1000

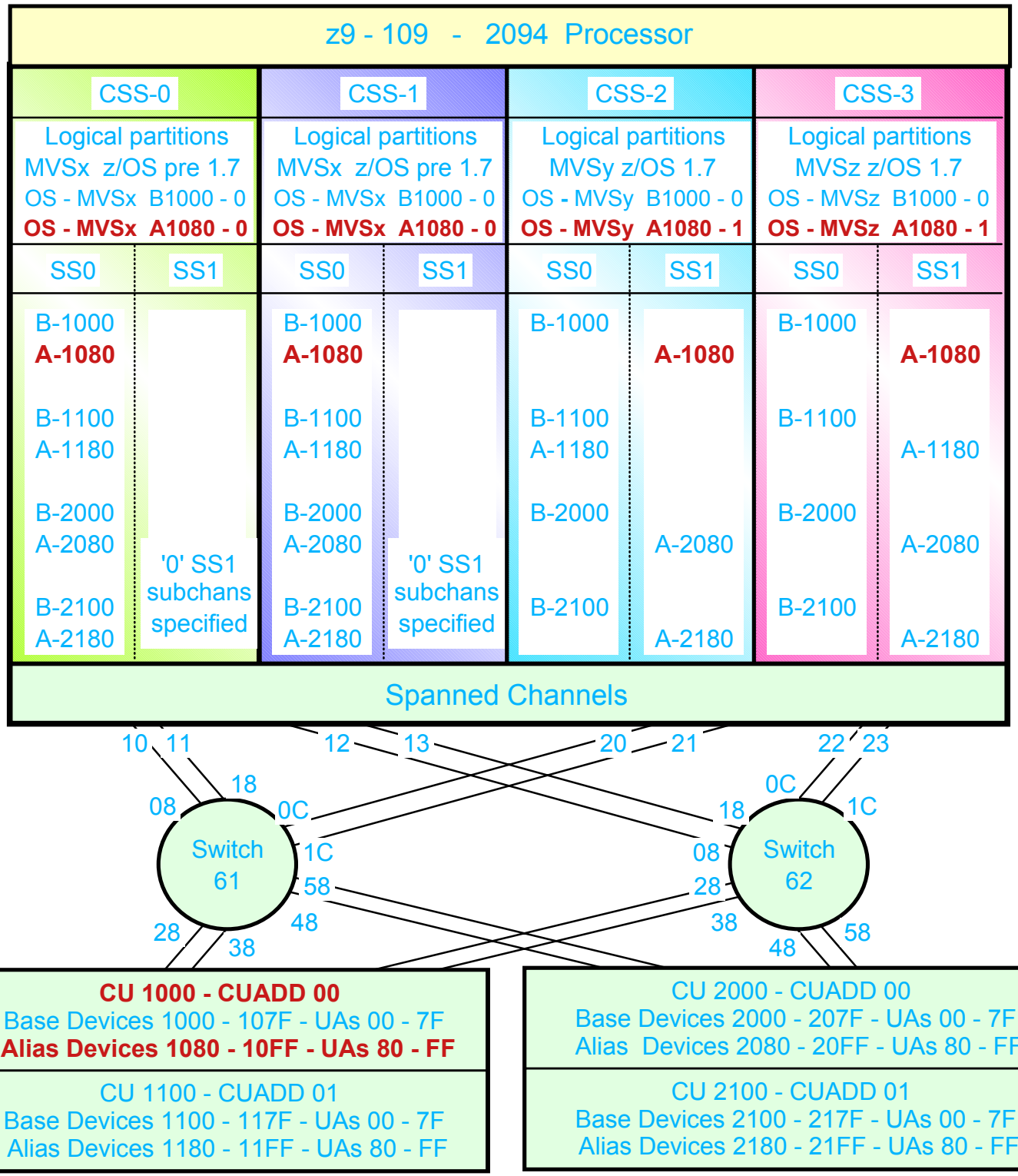
Base / Alias device definition demonstration

- Demonstration 1
  - Show how both the Base / Alias I/O devices are defined to both the Processor / CSSs and to the OSCONFIGs
    - Once defined, view the subchannel set usage (0 and 1) in all CSSs
      - Use HCD option 1.3.s - to view the subchannel sets subchannel usage

- Demonstration 2
  - Show how both the Base / Alias I/O devices are defined to both the Processor / CSSs and to the OSCONFIGs, but using s different Alias device numbers for CSS 3
    - Once defined, view the subchannel sett usage (0 and 1) in all CSSs
      - Use HCD option 1.3.s - to view the subchannel sets subchannel usage

Base / Alias device definition demonstration

- Demostration 1
  - Show how the Base / Alias I/O devices are defined to both the Processor / CSSs and to the OSCONFIGs
    - The same Base device number will be used in all CSSs
      1. Device 1000 defined in CSS 0 and CSS 1 in MSS 0
      2. Device 1000 defined in CSS 2 and CSS 3 in MSS 0
    - The same Alias device nunber will be used in all CSSs
      1. Device 1080 defined in CSS 0 and CSS 1 in MSS 0
      2. Device 1080 defined in CSS 2 and CSS 3 in MSS 1
    - Once defined, view the subchannel set usage (0 and 1) in all CSSs
      - Use HCD option 1.3.s - to view the subchannel sets subchannel usage



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 instead of SS0
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- z/OS 1.7 will support Alias devices defined in either SS0 or SS1 Alias
  - Note an alias device csn only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports alias devices that are defined in SS0
- An Alias devices can be defined in SS0 in one CSS and SS1 in another CSS
- This example shows Alias devices defined in SS0 in CSS0 and CSS1, and in SS1 in CSS2 and CSS3. Therefore z/OS pre 1.7 systems cannot run in CSS2 or CSS3 and acess the alias devices
- Note: This configuration will require one Processor definition (PROC.id) and three MVS definitions (MVS.id)
  - z/OS pre 1.7
    - OSCONFIG - MVSX
  - z/OS 1.7
    - OSCONFIG - MVSY or MVSZ
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 and - OSCONFIG(s)

```
                            Control Unit List                     Row 1 of 6
Command ===> ___________________________________________ Scroll ===> PAGE

Select one or more control units, then press Enter.  To add, use F11.

/ CU   Type +        #CSS #MC Serial-# + Description
_ 0061 2032                   __________ ________________________________
_ 0062 2032                   __________ ________________________________
S 1000 2105          4        __________ ________________________________
_ 1100 2105          4        __________ ________________________________
_ 2000 2105          4        __________ ________________________________
_ 2100 2105          4        __________ ________________________________
******************************* Bottom of data ********************************
```

- Proceed to define the Alias devices to the to the CUs. Following the sequence shown in this presentation will allow you to also to define the devices the the required processors/logical partitions, the required Subchannel Sets, and at a later stage to the required OSCONFIGs

Base I/O Device 1000 for 128 (3390B) defined to OSCONFIG.ids - MVSX, MVSY, MVSZ
Alias I/O Device 1080 for 128 (3390B) to be defined to OSCONFIG.ids - MVSX, MVSY, MVSZ

```
                              I/O Device List          Row 1 of 1 More:       >
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more devices, then press Enter. To add, use F11.

Control unit number  : 1000     Control unit type  . : 2105

  ----------Device------ --#--- --------Control Unit Numbers + --------
/ Number   Type +        CSS OS 1--- 2--- 3--- 4--- 5--- 6--- 7--- 8---
_ 1000,128 3390B         4   3  1000 ____ ____ ____ ____ ____ ____ ____
****************************** Bottom of data ********************************
```

- The panel shows that the Base devices are currently defned to this CU. Use F11 to add the Alias devices to the CU

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

Add Device

Specify or revise the following values.

```
Device number  . . . . . 1080  + (0000 - FFFF)
Number of devices  . . . . . 128_
Device type  . . . . . 3390A_______  +

Serial number  . . . . . _________
Description  . . . . . ________________________________

Volume serial number . . . . . ______  (for DASD)

Connected to CUs . . 1000  ____  ____  ____  ____  ____  ____  ____  +
```

- Define the 3390 Alias devices to CU 1000

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
                        Device / Processor Definition
                                                                  Row 1 of 4
Command ===> _____________________________________________ Scroll ===> PAGE

Select processors to change device/processor definitions, then press
Enter.

Device number  . . : 1080        Number of devices  . : 128
Device type  . . . : 3390A
                                          Preferred  Device Candidate List
/ Proc.CSSID  SS+  UA+  Time-Out  STADET  CHPID +     Explicit        Null
_ TEST2094.0  0    __   No        Yes     __         No              ___
_ TEST2094.1  0    __   No        Yes     __         No              ___
_ TEST2094.2  1    __   No        Yes     __         No              ___
_ TEST2094.3  1    __   No        Yes     __         No              ___
****************************** Bottom of data ********************************
  F1=Help       F2=Split      F3=Exit       F4=Prompt     F5=Reset
 F6=Previous   F7=Backward   F8=Forward    F9=Swap       F12=Cancel
F22=Command
```

F4 (Prompt)

- There is a need to understand the meaning of some of the selection options on this panel
  - SS (Subhannel Set) - in which CSS / Subchannel Set the device may be / will be defined - use promt (F4) to show allowed SSs
  - Explicit - Device Candidate List - provides selection as to which partitions may access the device
  - Null - Device Candidate List - if explicit is selected and no partitions, then this is a Null candidate list for the Processor/CSS
  - device 1080 can be placed in SS-0 or 1 of TEST2094 CSS-2 because thereare a number of subchannels defined in SS-1

```
                    Available Subchannel Set IDs
                  Select one.
                  Subchannel Set ID
                0
                1
```

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
            Define Device to Operating System Configuration
                                                              Row 1 of 3
Command ===> ___________________________________________ Scroll ===> PAGE

Select OSs to connect or disconnect devices, then press Enter.

Device number  . : 1080           Number of devices  : 128
Device type  . . : 3390A

/ Config. ID   Type     SS Description                      Defined
c MVSX         MVS
c MVSY         MVS
c MVSZ         MVS
************************** Bottom of data ***************************
```

- Define the Alias 1080,128 to all 3 OSCONFIGs
  - MVSx is planned to run in CSS 0 partitions therefore must be defined as being supported by the OSCONFIG in MSS 0
  - MVSy is planned to run in CSS 2 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1
  - MVSz is planned to run in CSS 3 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
       Define Device to Operating System Configuration

                      Specify Subchannel Set ID


Specify the ID of the subchannel set into which devices are placed,
then press Enter.

Configuration ID . : MVSX
Device number  . . : 1080            Number of devices  : 128
Device type  . . . : 3390A

Subchannel Set ID    0  +

 F1=Help    F2=Split   F3=Exit    F4=Prompt  F5=Reset   F9=Swap
F12=Cancel
s
```

- Define the Alias 1080,128 to all 3 OSCONFIGs
  - MVSx is planned to run in CSS 0 partitions therefore must be defined as being supported by the OSCONFIG in MSS 0
  - MVSy is planned to run in CSS 2 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1
  - MVSz is planned to run in CSS 3 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
       Define Device to Operating System Configuration

                      Specify Subchannel Set ID


Specify the ID of the subchannel set into which devices are placed,
then press Enter.

Configuration ID . : MVSY
Device number  . . : 1080           Number of devices  : 128
Device type  . . . : 3390A

Subchannel Set ID    1  +

 F1=Help    F2=Split   F3=Exit    F4=Prompt  F5=Reset   F9=Swap
F12=Cancel
s
```

- Define the Alias 1080,128 to all 3 OSCONFIGs
  - MVSx is planned to run in CSS 0 partitions therefore must be defined as being supported by the OSCONFIG in MSS 0
  - MVSy is planned to run in CSS 2 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1
  - MVSz is planned to run in CSS 3 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
       Define Device to Operating System Configuration

                      Specify Subchannel Set ID


Specify the ID of the subchannel set into which devices are placed,
then press Enter.

Configuration ID . : MVSZ
Device number  . . : 1080            Number of devices  : 128
Device type  . . . : 3390A

Subchannel Set ID    1  +

 F1=Help    F2=Split   F3=Exit    F4=Prompt  F5=Reset   F9=Swap
F12=Cancel
s
```

- Define the Alias 1080,128 to all 3 OSCONFIGs
  - MVSx is planned to run in CSS 0 partitions therefore must be defined as being supported by the OSCONFIG in MSS 0
  - MVSy is planned to run in CSS 2 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1
  - MVSz is planned to run in CSS 3 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
            Define Device to Operating System Configuration
                                                              Row 1 of 3
Command ===> ___________________________________________ Scroll ===> PAGE

Select OSs to connect or disconnect devices, then press Enter.

Device number  . : 1080           Number of devices  : 128
Device type  . . : 3390A

/ Config. ID   Type     SS Description                        Defined
_ MVSX         MVS      0                                    Yes
_ MVSY         MVS      1                                    Yes
_ MVSZ         MVS      1                                    Yes
************************** Bottom of data ***************************
```

- Alias device 1080,128 to has been defined to all 3 OSCONFIGs
  - MVSx is planned to run in CSS 0 partitions therefore must be defined as being supported by the OSCONFIG in MSS 0
  - MVSy is planned to run in CSS 2 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1
  - MVSz is planned to run in CSS 3 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
                            I/O Device List          Row 1 of 2 More:       >
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more devices, then press Enter. To add, use F11.

Control unit number  : 1000     Control unit type  . : 2105

  ----------Device------ --#--- --------Control Unit Numbers + --------
/ Number   Type +        CSS OS 1--- 2--- 3--- 4--- 5--- 6--- 7--- 8---
_ 1000,128 3390B         4   3  1000 ____ ____ ____ ____ ____ ____ ____
_ 1080,128 3390A         4   3  1000 ____ ____ ____ ____ ____ ____ ____
```

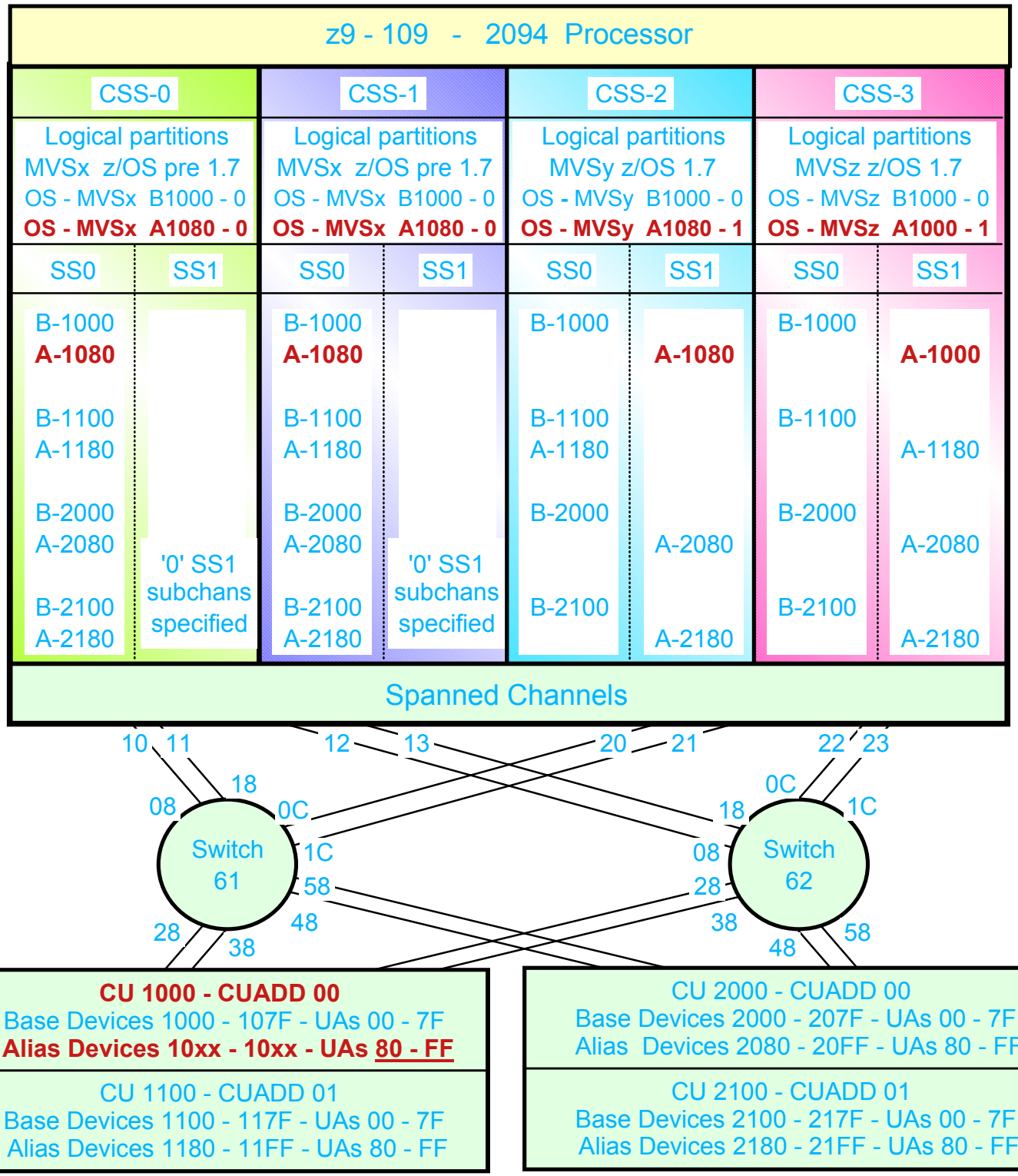
- Base devices 1000,128 and Alias device 1080,128 to has been defined to all 4 2094 CSSs and 3 OSCONFIGs

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
                          Channel Subsystem List                  Row 1 of 4
Command ===> ____________________________________________________ Scroll ===>
PAGE

Select one or more channel subsystems, then press Enter.  To add, use F11.

Processor ID . . . : TEST2094

  CSS Devices in SS0    Devices in SS1
/ ID  Maximum + Actual  Maximum + Actual  Description
_ 0   64512     258     0         0       All LPs will use z/OS pre 1.7
_ 1   64512     258     0         0       All LPs will use z/OS pre 1.7
_ 2   65280     130     32000     128     LP mix of z/OS pre 1.7 and 1.7
_ 3   65280     130     65535     128     Al LPs will use z/OS 1.7
```

- 2094 CSS 0 - 2 switches + 128 Bases + 128 Aliases defined in MSS 0 = 258 devices defined in CSS 0
- 2094 CSS 1 - 2 switches + 128 Bases + 128 Aliases defined in MSS 0 = 258 devices defined in CSS 1
- 2094 CSS 2 - (2 switches + 128 Bases = 130 devices defined in MSS 0) + (128 Alias devices defined in MSS 1) = 258 devices defined in CSS 2
- 2094 CSS 3 - (2 switches + 128 Bases = 130 devices defined in MSS 0) + (128 Alias devices defined in MSS 1) = 258 devices defined in CSS 3

- Demostration 2
  - Show how both the Base / Alias I/O devices are defined to both the Processor / CSSs and to the OSCONFIGs, but using different Alias device numbers for CSS 3
    - The same Base device number will be used in all CSSs
    - The Alias device CU Number 1000 CUADD 0 UA 80 will be defined as follows
      1. The Alias device number 1080 will be used (for Alais device UA 80) in CSS 0 and CSS 1 and placed in MSS 0
      2. The Alias device number 1080 will be used (for Alais device UA 80) in CSS 2 and placed in MSS 1
      3. The Alias device number ***1000*** will be used (for Alias device UA 80) in CSS 3 and placed in MSS 1
    - The above definition will require the use of the Explicit and Null candidate list options, the purpose of this demostraction is to show how the Explicit and Null options are used in the above three cases
    - Once defined, view the subchannel set usage (0 and 1) in all CSSs
      - Use HCD option 1.3.s - to view the subchannel sets subchannel usage



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 instead of SS0
- This allows all the subchannels in SS0 to be used in support of Base DASD devices and other devices (non-DASD)
- z/OS 1.7 will support Alias devices defined in either SS0 or SS1 Alias
  - Note an alias device csn only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports alias devices that are defined in SS0
- An Alias devices can be defined in SS0 in one CSS and SS1 in another CSS
- This example shows Alias devices defined in SS0 in CSS0 and CSS1, and in SS1 in CSS2 and CSS3. Therefore z/OS pre 1.7 systems cannot run in CSS2 or CSS3 and acess the alias devices
- Note: This configuration will require one Processor definition (PROC.id) and three MVS definitions (MVS.id)
  - z/OS pre 1.7
    - OSCONFIG - MVSX
  - z/OS 1.7
    - OSCONFIG - MVSY or MVSZ
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 and - OSCONFIG(s)

```
                                Control Unit List                          Row 1 of 6
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more control units, then press Enter.  To add, use F11.

/ CU   Type +        #CSS #MC Serial-# + Description
_ 0061 2032                   __________ ________________________________
_ 0062 2032                   __________ ________________________________
S 1000 2105          4        __________ ________________________________
_ 1100 2105          4        __________ ________________________________
_ 2000 2105          4        __________ ________________________________
_ 2100 2105          4        __________ ________________________________
****************************** Bottom of data ********************************
```

- Proceed to define the Alias devices to the to the CUs. Following the sequence shown in this presentation will allow you to also to define the devices the the required processors/logical partitions, the required Subchannel Sets, and at a later stage to the required OSCONFIGs

Base I/O Device 1000 for 128 (3390B) defined to OSCONFIG.ids - MVSX, MVSY, MVSZ
Alias I/O Device 1080 for 128 (3390B) to be defined to OSCONFIG.ids - MVSX, MVSY, MVSZ

```
                              I/O Device List          Row 1 of 1 More:       >
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more devices, then press Enter. To add, use F11.

Control unit number  : 1000     Control unit type  . : 2105

  ----------Device------ --#--- --------Control Unit Numbers + --------
/ Number   Type +        CSS OS 1--- 2--- 3--- 4--- 5--- 6--- 7--- 8---
_ 1000,128 3390B         4   3  1000 ____ ____ ____ ____ ____ ____ ____
******************************* Bottom of data ********************************
```

- The panel shows that the Base devices are currently defned to this CU. Use F11 to add the Alias devices to the CU

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

Add Device

Specify or revise the following values.

```
Device number  . . . . . 1080  + (0000 - FFFF)
Number of devices  . . . . . 128_
Device type  . . . . . 3390A_______  +

Serial number  . . . . . _________
Description  . . . . . ________________________________

Volume serial number . . . . . ______  (for DASD)

Connected to CUs . . 1000  ____  ____  ____  ____  ____  ____  ____  +
```

- Define the 3390 Alias devices to CU 1000

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
                        Device / Processor Definition
                                                                  Row 1 of 4
Command ===> ____________________________________________ Scroll ===> PAGE

Select processors to change device/processor definitions, then press
Enter.

Device number  . . : 1080        Number of devices  . : 128
Device type  . . . : 3390A
                                          Preferred  Device Candidate List
/ Proc.CSSID  SS+  UA+  Time-Out  STADET  CHPID +    Explicit       Null
_ TEST2094.0  0    __   No        Yes     __         No             ___
_ TEST2094.1  0    __   No        Yes     __         No             ___
_ TEST2094.2  1    __   No        Yes     __         No             ___
_ TEST2094.3  1    __   No        Yes     __         Yes            ___
****************************** Bottom of data ***************************
  F1=Help       F2=Split      F3=Exit       F4=Prompt      F5=Reset
 F6=Previous   F7=Backward   F8=Forward    F9=Swap        F12=Cancel
F22=Command
```

- There is a need to understand the meaning of some of the selection options on this panel
  - SS (Subhannel Set) - in which CSS / Subchannel Set the device may be / will be defined - use promt (F4) to show allowed SSs
  - Explicit - Device Candidate List - provides selection as to which partitions may access the device
  - Null - Device Candidate List - if explicit is selected and no partitions, then this is a Null candidate list for the Processor/CSS
  - device 1080 can be placed in SS-0 or 1 of TEST2094 CSS-2 because thereare a number of subchannels defined in SS-1

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
                    Define Device Candidate List
                                                                Row 1 of 4
Command ===> ____________________________________ Scroll ===> PAGE

Select one or more partitions to allow them to access the device,
or ENTER to continue without selection.

Device number  . . . : 1080      Number of devices  . . . : 128
Device type  . . . . : 3390A
Processor ID . . . . : TEST2094
Channel Subsystem ID : 3         Al LPs will use z/OS 1.7

/ Partition Name  Description                        Reachable
_ LPS                                                Yes
_ LPT                                                Yes
_ LPU                                                Yes
_ LPZ                                                Yes
```

- There is a need to understand the meaning of some of the selection options on this panel
  - SS (Subhannel Set) - in which CSS / Subchannel Set the device may be / will be defined - use promt (F4) to show allowed SSs
  - Explicit - Device Candidate List - provides selection as to which partitions may access the device
  - Null - Device Candidate List - if explicit is selected and no partitions, then this is a Null candidate list for the Processor/CSS
  - For this example none of the partitions (LPS, LPT, LPU, LPZ) are selected, therefore its a NULL candidate list

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
                        Device / Processor Definition
                                                                Row 1 of 4
Command ===> ____________________________________________ Scroll ===> PAGE

Select processors to change device/processor definitions, then press
Enter.

Device number  . . : 1080       Number of devices  . : 128
Device type  . . . : 3390A

                                                 Preferred  Device Candidate List
/ Proc.CSSID  SS+  UA+  Time-Out  STADET  CHPID +    Explicit       Null
_ TEST2094.0  0    __   No        Yes     __         No             ___
_ TEST2094.1  0    __   No        Yes     __         No             ___
_ TEST2094.2  1    __   No        Yes     __         No             ___
_ TEST2094.3  1    80   No        Yes     __         Yes            Yes
```

- Device 1080,defined on CU 1000 using UA x'80' is defined not to be accessed by any paritions in CSS 3
- However all the partitions defined to access the CHPIDs to CU 1000 have access to device 1080,128 (using UA x'80') i.e. they have not been explicitly prevented from accessing the device.

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
            Define Device to Operating System Configuration
                                                              Row 1 of 3
Command ===> ___________________________________________ Scroll ===> PAGE

Select OSs to connect or disconnect devices, then press Enter.

Device number  . : 1080           Number of devices  : 128
Device type  . . : 3390A

/ Config. ID   Type     SS Description                      Defined
c MVSX         MVS
c MVSY         MVS
- MVSZ         MVS
************************** Bottom of data ***************************
```

- Define the Alias 1080,128 to only OSCONFIGs - MVSx and MVSy
  - MVSx is planned to run in CSS 0 partitions therefore must be defined as being supported by the OSCONFIG in MSS 0
  - MVSy is planned to run in CSS 2 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
       Define Device to Operating System Configuration

                      Specify Subchannel Set ID


Specify the ID of the subchannel set into which devices are placed,
then press Enter.

Configuration ID . : MVSX
Device number  . . : 1080            Number of devices  : 128
Device type  . . . : 3390A

Subchannel Set ID    0  +

 F1=Help    F2=Split   F3=Exit    F4=Prompt  F5=Reset   F9=Swap
F12=Cancel
```

- Define the Alias 1080,128 to all 3 OSCONFIGs
  - MVSx is planned to run in CSS 0 partitions therefore must be defined as being supported by the OSCONFIG in MSS 0
  - MVSy is planned to run in CSS 2 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
       Define Device to Operating System Configuration

                      Specify Subchannel Set ID


Specify the ID of the subchannel set into which devices are placed,
then press Enter.

Configuration ID . : MVSY
Device number  . . : 1080            Number of devices  : 128
Device type  . . . : 3390A

Subchannel Set ID    1  +

 F1=Help    F2=Split   F3=Exit    F4=Prompt  F5=Reset   F9=Swap
F12=Cancel
s
```

- Define the Alias 1080,128 to all 3 OSCONFIGs
  - MVSx is planned to run in CSS 0 partitions therefore must be defined as being supported by the OSCONFIG in MSS 0
  - MVSy is planned to run in CSS 2 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
            Define Device to Operating System Configuration
                                                              Row 1 of 3
Command ===> ___________________________________________ Scroll ===> PAGE

Select OSs to connect or disconnect devices, then press Enter.

Device number  . : 1080           Number of devices  : 128
Device type  . . : 3390A

/ Config. ID   Type     SS Description                        Defined
_ MVSX         MVS      0                                    Yes
_ MVSY         MVS      1                                    Yes
_ MVSZ         MVS
************************** Bottom of data ***************************
```

- Alias device 1080,128 to has been defined to MVSx and MVSy
  - MVSx is planned to run in CSS 0 partitions therefore must be defined as being supported by the OSCONFIG in MSS 0
  - MVSy is planned to run in CSS 2 partitions therefore must be defined as being supported by the OSCONFIG in MSS 1
- Alias device 1080,128 has not / should not be defined to MVSz - for MVSZ Alias device 'CU 1000 x'80" device number 1000 will be used

Define Alias Device(s) to: Processor / CSS(s) - CU 1000 - OSCONFIG(s)

```
                            I/O Device List          Row 1 of 2 More:       >
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more devices, then press Enter. To add, use F11.

Control unit number  : 1000     Control unit type  . : 2105

  ----------Device------ --#--- --------Control Unit Numbers + --------
/ Number   Type +        CSS OS 1--- 2--- 3--- 4--- 5--- 6--- 7--- 8---
_ 1000,128 3390B         4   3  1000 ____ ____ ____ ____ ____ ____ ____
_ 1080,128 3390A         4   2  1000 ____ ____ ____ ____ ____ ____ ____
```

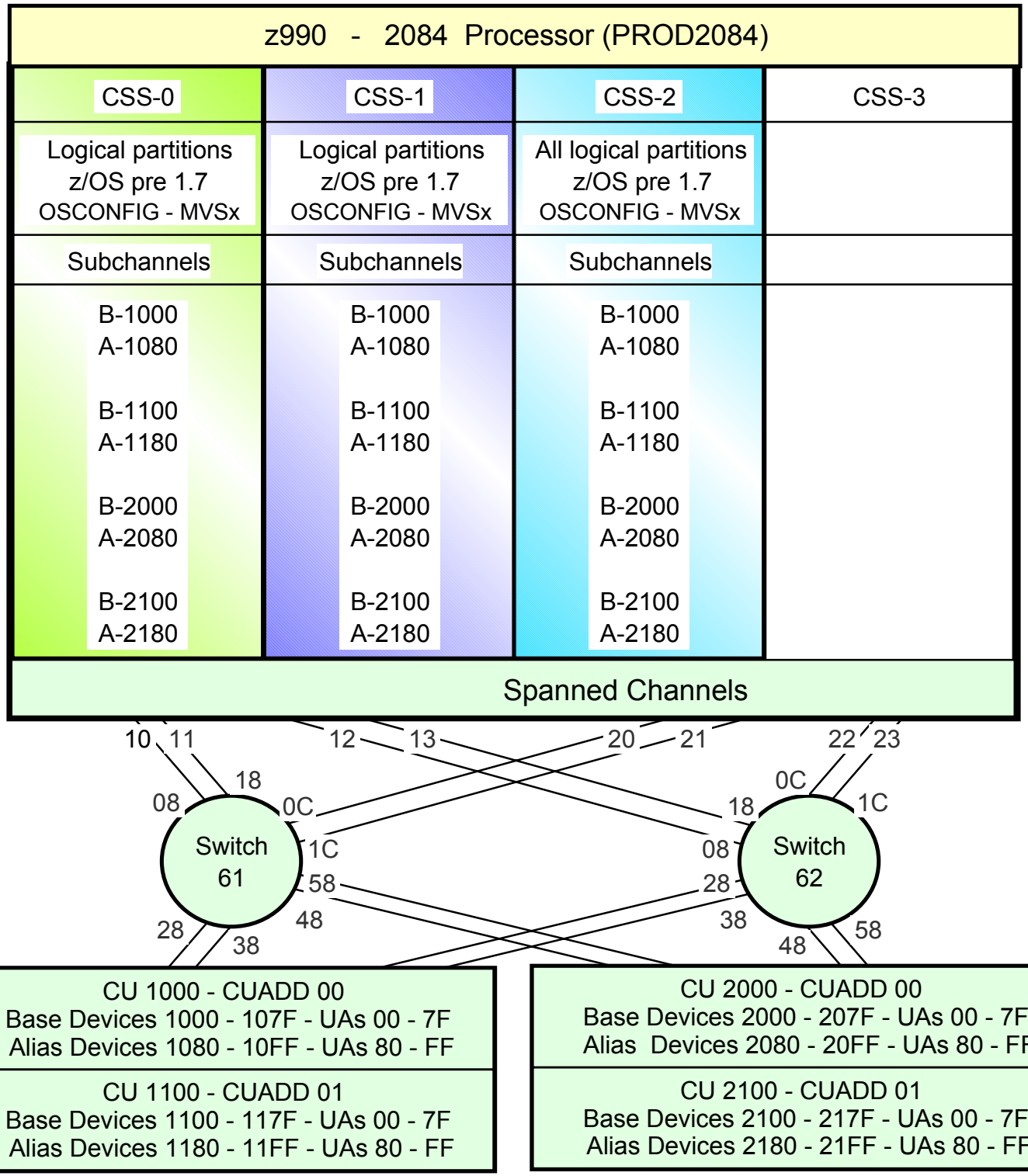
- Base devices 1000,128 has been defined to all 4 2094 CSSs and all 3 OSCONFIGs
- Alias device 1080,128 to has been defined to all 4 2094 CSSs but only 2 OSCONFIGs

Note:When a device has been defined to a CSS but with a NULL candidate list it still shows as being defined to the CSS

IBM System z9 109 - 2094
I/O Configuration Support - Installation Sequence
Subchannel Sets
Alias Device Support, 2094 and z/OS

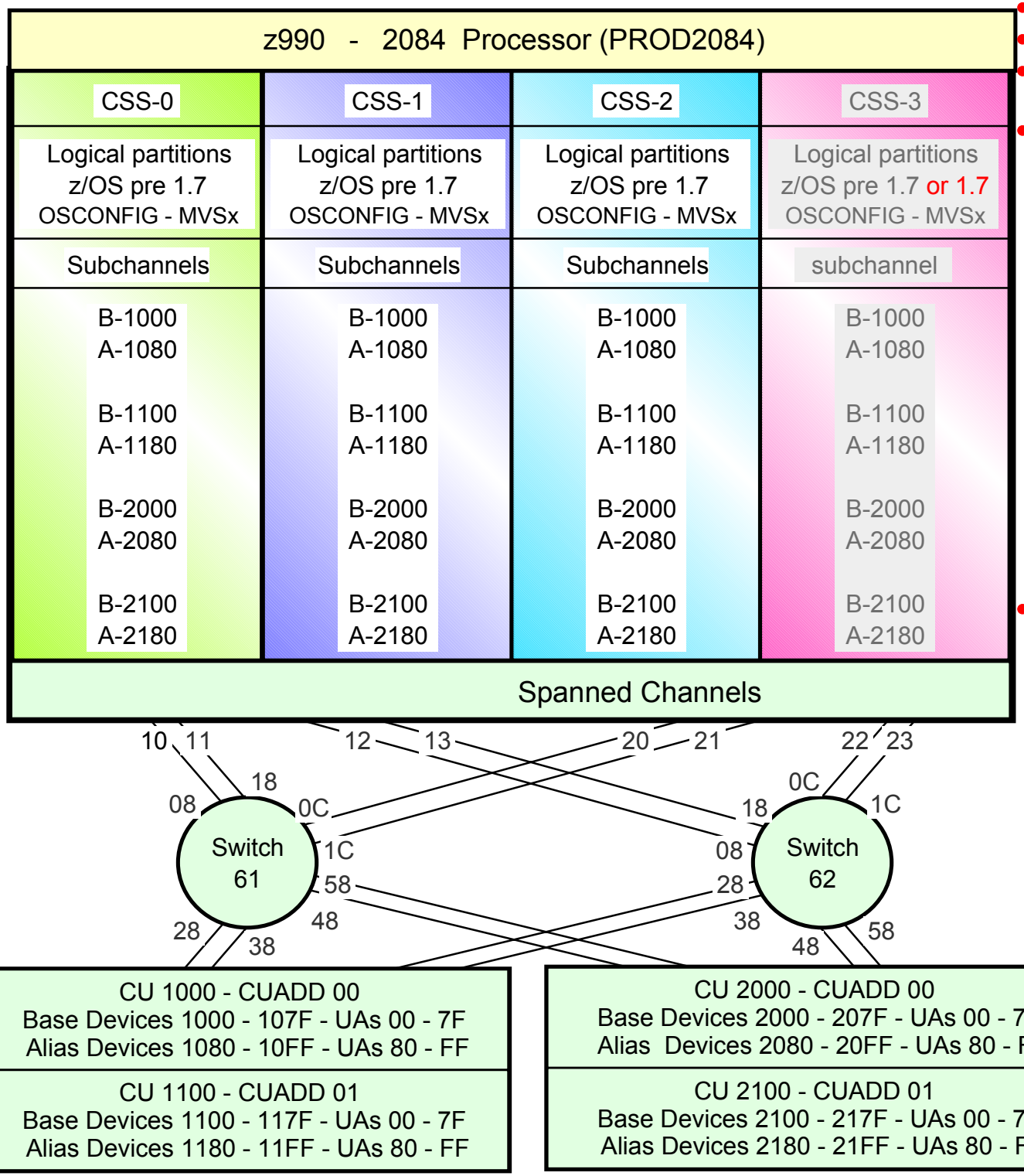
Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

zSeries z990 2084 - Current I/O Configuration Support



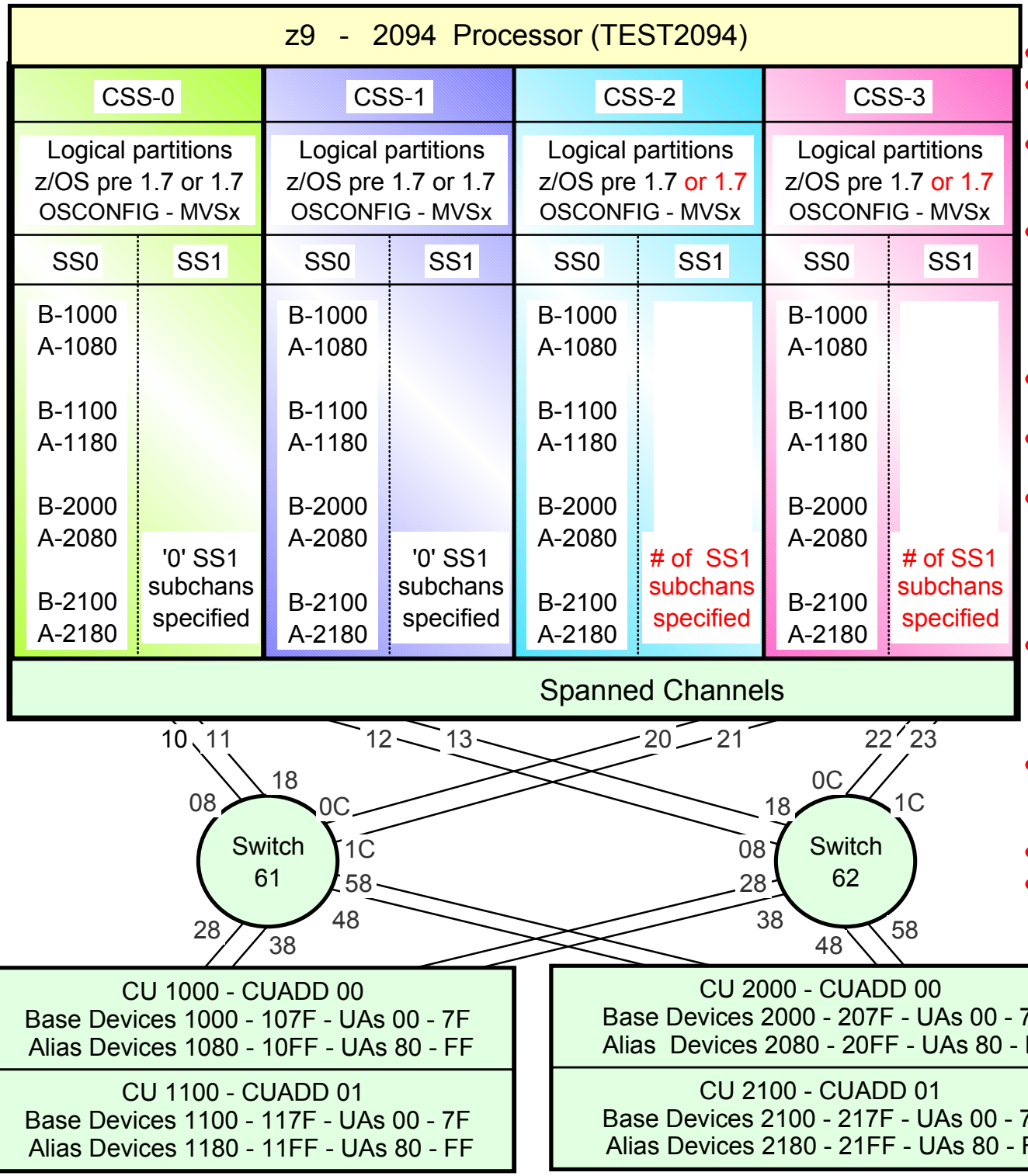
- All Bases are defined to CSS 0, 1, 2
- All Aliases are defined to CSS 0, 1, 2
- For this example either CSS3 is not defined in the 2084 or if defined the z/OSs running in CSS3 logical partitions will be ungraded to z/OS 1.7 prior to a 2084 to 2094 upgrade or when the 2084 is MES upgraded to a 2094. This is to allow the z/OS 1.7 to exploit the movement of Alias devices on the 2094 from SS0 to a SS1 in the 2094 CSS-3 and freeing up subchannels in the 2094 CCS-3 SS0 for the definition of additional Base devices in 2094 CSS-3 SS0.
  - Note: Once the Alias devices are defined in SS1 in a 2094 CSS all z/OSs running in logical partitions in that 2094 CSS must be at z/OS 1.7 or later to be able to access the Alias subchannels in that 2094 CSSs SS1 (covered later in this presentation).

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS



- All Bases are defined in CSS 0, 1, 2
- All Aliases are defined in CSS 0, 1, 2
- z/OS 1.7 has been installed and is running in at least one logical partition in any of the CSSs
- For this example either CSS3 is not defined in the 2084 or if defined then one or more z/OSs running in the 2084 CSS3 logical partitions will be upgraded to z/OS 1.7 prior to a 2084 to 2094 upgrade, or when the 2084 is MES upgraded to a 2094. This allows z/OS 1.7 to exploit the movement of Alias devices on the 2094 from SS0 to a SS1(in one or all 2094 CSSs) and freeing up subchannels in the 2094 CSS SS0 for the definition of additional Base devices in SS0s in the 2094 CSSs.
  - Note: Once the Alias devices are defined in SS1 in a 2094 CSS all z/OSs running in logical partitions in that 2094 CSS must be at z/OS 1.7 or later to be able to access the Alias subchannels in that 2094 CSS SS1 (covered later in this presentation).
- Once z/OS 1.7 is installed.
  - Upgrade the 2084 definition to a 2094 or define initially the 2094 (include 2094 SS1)
  - Proc.id = TEST2094
  - No change to OSCONFIG MVSx
  - Map 2094 PCHIDs to 2094 CHPIDs
  - Build a new Production IODF
  - Write a 2094 IOCDS, to the 2084 or 2094
  - Customize a 2094 Reset Profile
  - Reset Profile Activate the 2094
  - IPL z/OS 1.7 in at least one 2094 Logical Partition. z/OS pre1.7 may be IPL'd in other logical partitions
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

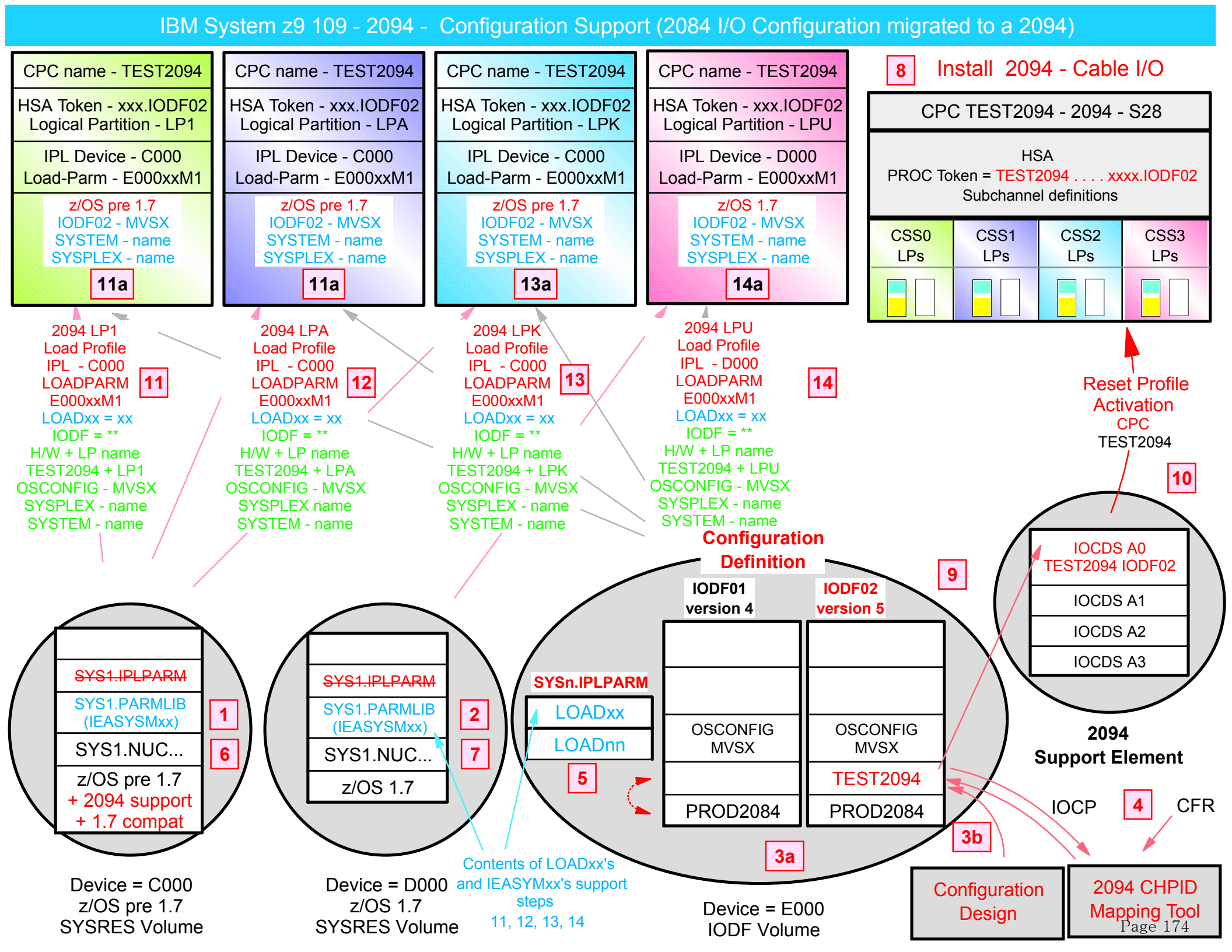
IBM System z9 109 - 2094 - Configuration Support (2084 I/O Configuration migrated to a 2094)



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 instead of SS0 (see later)
- This allows all the subchannels in SS0 to be used in support of additional Base DASD devices and other devices (non-DASD)
- z/OS 1.7 will support Alias devices defined in either SS0 or SS1
  - Note: a CSS alias device (CI - D_ID - CUI - UA) can only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports/uses alias devices that are defined in SS0
- An Alias device can be defined in SS0 in one CSS and SS1 in another CSS
- This example shows Alias devices defined in SS0 in all of the CSSs. Either z/OS pre 1.7 or z/OS 1.7 may be used in any partition in any CSS.
  - At least one 2094 partition MUST have z/OS 1.7 for dynamic I/O changes
- Note: This configuration only requires one Processor definition (PROC.id) and may require only one OSCONFIG definition
  - OSCONFIG - MVSx
- There is no Base device relief, in this example in SS0 as all Alias devices are still defined in SS0 in each of the CSSs
- CSS 0/1 have no SS1 subchannels defined
- CSS 2/3 have SS1 subchannels defined, and therefore the alias devices in CSS2/3 SS0 may be dynamically moved to SS1

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

IBM System z9 109 - 2094 - Configuration Support (2084 I/O Configuration migrated to a 2094)



z9 2094 - Definition - Installation - Activation - IPL

1. Install the z/OS 1.4 - 1.6 2094 'compat' support (2094 definition - no SS-1, and ability to read verion 5 IODF format)
2. Install z/OS 1.7
3. Define the 2094 processor the I/O configuration (includes the Switches, CUs and Devices), and the OSCONFIGs
   - This includes the new zSeries subchannel sets feature and the placenment of Alias devices
   - Some or all of the Alias devices may be defined in SS1 for some or all of the CSSs
   - Depending on which Image (logical partition) a OSCONFIG will be used, it should match the Alias subchannel definition location for the CSS / logical partition (this is a new requirement)
4. For 2094 channel-to-CU availablility map the CHPIDs to PCHIDs
   - The channel path internal availability characteristics of the 2094 is different from the previous zSeries processors therefore it is strongly recommended that the CHPID Mapping Tool (CMT) that supports the 2094 be used
5. Create and customize the LOADxx member(s) in SYSn.IPLPARM or SYS1.PARMLIB
   - Multiple z/OS levels are supported on the same processor at the same time, and each may have different alias support requirements
   - Specify the IODF search requirements, and each logical partition OSCONFIG requirement
   - Specify other LOADxx requirements
6. Make any required changes to the z/OS 1.7 SYSRES volume
   - i.e. IEASYMxx in SYS1.PARMLIB
7. Make any required changes to the z/OS pre 1.7 SYSRES volume
   - i.e. IEASYMxx in SYS1.PARMLIB
8. Install the 2094 processor (TEST2094) and connect the channel cables
9. Write the IOCDS to TEST2094
10. For processor TEST2094, Customize the Reset profile and perform a Reset Profile activation
11. Customize the Image and Load profiles for TEST2094 logical partition LP1, Image activate and IPL LP1
    - Specify the required Load device (SYSRES), and the Loadparms (IODF device and LOADxx)
12. Customize the Image and Load profiles for TEST2094 logical partition LPA , Image activate and IPL LPA
    - Specify the required Load device (SYSRES), and the Loadparms (IODF device and LOADxx)
13. Customize the Image and Load profiles for TEST2094 logical partition LPK, Image activate and IPL LPK
    - Specify the required Load device (SYSRES), and the Loadparms (IODF device and LOADxx)
14. Customize the Image and Load profiles for TEST2094 logical partition LPU, image activate and IPL LPU
    - Specify the required Load device (SYSRES), and the Loadparms (IODF device and LOADxx)

System IPL actions for each Logical Partition IPL (Load) operation

1. IPL from the Load Device specified in Load Profile (SYSRES device, - SYSRES volume)
2. Read in the IPLTEXT - IEAIPL00
   - Save the IPL load device number
3. Read more of the IRIMs (IPL Resource initialization Modules) from the load device
4. Obtain from the hardware the Image/Load Profile 'Loadparms' - the IODF device number and LOADxx value
5. Obtain the Processor Token from HSA - the last 2 fields (Descriptor fields 1 and 2) will be used to search for the IODF dataset if the Loadxx option is ** ++ -- == (see MVS Initialization and Tuning Reference)
6. Obtain from the hardware the CPC Object name and Logical Partition name
7. Access the IODF device - IODF volume (IODF device number - 1st 4 digits of the Loadparms)
8. Search for SYSn.IPLPARM (search from 0 to 9) on the IODF volume
9. If no SYSn.IPLPARM look for SYS1.PARMLIB on the IODF volume, then SYS1.PARMLIB on the SYSRES device
10. If no SYSn.IPLPARM or SYS1.PARMLIB dataset found - wait state the system
11. For the first SYSn.IPLPARM or SYS1.PARMLIB dataset found, find and read the required LOADxx member
    - The customer may setup a common LOADxx member for all logical partitions, one for each Logical partition, or set up for a number logical partitions to use the same LOADxx member, or setup one per Processor (CPC)
    - General recommendation is to have one common LOADxx member that all Logical Partitions use
    - If the required Loadxx member is not found - wait state the system
12. From the LOADxx member determine what IODF datset name to use (based on the IODF statement)
    - The required IODF dataset name can be based on the HSA token contents or is hard coded in the LOADxx
13. Search for the required IODF dataset on the IODF volume
    - If the IODF dataset is not found - wait state the system
14. Determine from the LOADxx member what OSCONFIG to use (based on the OSCONFIG statement for the H/W-LP)
    - The OSCONFIG name can be defaulted to a hard coded value in LOADxx or a Hard Coded value can be specified that can be selected based on the CPC hardware name and the Logical partition name
    - If the required OSCONFIG is not found, wait state the system
15. The OSCONFIG defines what devices are supported by this z/OS and what **subchannel set is used for a device**

- OSCONFIG - correct SELECTION
  - All Alias devices on hardware processor CPC name TEST2094 are initially defined in SS0 in all CSSs, therefore all z/OS systems running on this CPC can use the same OSCONFIG definition.
  - In this example MVSX is specified in SYSx.IPLPARM(LOADxx).
  - But this sample does show filtering by CPC Name (Processor Name) and LPAR Name (for later reasons, when SS-1 is used and a different OSCONFIGS are required).

```
NUCLEUS  1
NUCLST   XX
IEASYM   XX
PARMLIB  SYS1.SYSPROG.PARMLIB
PARMLIB  SYS1.PARMLIB
PARMLIB  CPAC.PARMLIB
PARMLIB  SYS1.IBM.PARMLIB
*-----------DEFINITION FOR SC01(LP1)-------------*
HWNAME   TEST2094
LPARNAME LP1
IODF     ** SYS6     MVSX 01 Y
SYSPLEX  PRODPLEX
SYSCAT   SBOX111   MCAT.SANDBOX.Z06.VSBOX11
*-----------DEFINITION FOR SC02(LPA)-------------*
HWNAME   TEST2094
LPARNAME LPA
IODF     ** SYS6     MVSX 01 Y
SYSPLEX  PRODPLEX
SYSCAT   SBOX111   MCAT.SANDBOX.Z06.VSBOX11
*-----------DEFINITION FOR SCxx(LPK)-------------*
HWNAME   TEST2094
LPARNAME LPK
IODF     ** SYS6     MVSX 01 Y
SYSPLEX  PRODPLEX
SYSCAT   SBOX111   MCAT.SANDBOX.Z06.VSBOX11
*-----------DEFINITION FOR SCyy(LPU)-------------*
HWNAME   TEST2094
LPARNAME LPU
IODF     ** SYS6     MVSX 01 Y
SYSPLEX  PRODPLEX
SYSCAT   SBOX111   MCAT.SANDBOX.Z07.VSBOX11
*------------------------------------------------*
```

z/OS pre 1.7 or z/OS1.7

Member IEASYMxx in SYS1.PARMLIB

In this sample we show filtering by Processor Hardware Name and LPAR Name.

For CPC name TEST2094 and Logical Partition name LP1 we show the definition of the system name, the IEASYSxx concatenation sequence, and the definition of some static system symbols unique to this LPAR.

```
SYSCLONE(&SYSNAME(3:2))
                    SYMDEF(&SYSR2='&SYSR1(1:5).2')
                    SYMDEF(&SYSR3='&SYSR1(1:5).3')

  SYSDEF            HWNAME(TEST2094)
                    LPARNAME(LP2)
                    ...

  SYSDEF            HWNAME(TEST2094)
                    LPARNAME(LP1)
                    SYSNAME(SC01)
                    SYSPARM(R3,01)
                    SYMDEF(&DFHSMHST='4')
                    SYMDEF(&DFHSMPRI='YES')
                    SYMDEF(&IGDSMSXX='03')

  SYSDEF            HWNAME(TEST2094)
                    LPARNAME(LPA)
                    ...
```

IBM System z9 109 - 2094
I/O Configuration Support - Installation
Subchannel Sets -
Alias Device Support, 2094 and z/OS
IPL z/OS 1.7 - z/OS 1.6 - IPL

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

\	Processor support System z/OS 1.7 2094 support included	Other systems z/OS 1.4 - 1.6 with 2094comatibility support	Other systems z/OS 1.4 - 1.6 without 2094 compatibility support
Operation / Condition	z/0S 1.7	z/0S 1.4 - 1.6	z/0S 1.4 - 1.6
2094 z/OS Support	Full 2094 Support installed SS-1 S/W UCBs can be defined and are supported SS-1 H/W subchannels can be defined and are supported	2094 compstibility sbvupport Installed SS-1 S/W UCBs and hardware SS-1 subchannels mcan be defined by z/OS 1.7 but the SS-1 UCBs are not supported by z/OS 1.4-1.6, and the SS-1 H/W subchannels are ignored	2094 support not installed SS-1 S/W UCBs cannot be defined SS-1 H/W subchannels may be defined but are ignored
Installed system HCD level	z/OS HCD 1.7	z/OS HCD 1.4	z/OS HCD 1.4
Processor IODF Used for IOCP / IOCDS	z/OS HCD 1.7 version 5 IODF	z/OS HCD 1.7 version 5 IODF	Not from this system, use z/OS HCD 1.7 version 5 IODF
IPL Support Version 5 IODF	Yes - and using version 5 IODF	Yes	No, using the version 4 IODF
OSCONFIG IODF	z/OS HCD 1.7 Version 5 IODF LOADxx = ** OSCONFIG = CPC + LP	z/OS HCD 1.7 Version 5 IODF LOADxx=** OSCONFIG = CPC+ LP	z/OS 1.4 - 1.6 using version 4 IODF LOADxx= Hardcoded OSCONFIG = CPC + LP
IPL and use the IODF / OSCONFIG for this Image	Yes Version 5 IODF	Yes Version 5 IODF	Yes Version 4 IODF Hardcoded in the LOADxx
View the IPL'd IODF	Yes	??? No	Yes Version 4 IODF
IOCP Program	z/OS 1.7 ICPIOCP V1 R3	z/OS 1.7 ICPIOCP V1 R3	z/OS 1.7 ICPIOCP V1 R3
2094 IOCDS Source	z/OS 1.7 ICPIOCP V1 R3	z/OS 1.7 ICPIOCP V1 R3	z/OS 1.7 ICPIOCP V1 R3
2094 Processor or I/O Configuration H/W definition Change	Yes, using the z/OS 1.7 version 5 IODF	Do not use this system Use the z/OS 1.7 system	Do not use this system Use the z/OS 1.7 system
I/O Configuration S/W definition Change	Yes, using the z/OS 1.7 version 5 IODF	Do not use this system Use the z/OS 1.7 system	Yes, using the z/OS 1.4-1.6 version 4 IODF
Dynamic Software change	Yes	Yes using the version 5 IODF	Yes using the version 4 IODF
Dynamic Hardware change	Yes	Do not use this system Use the z/OS 1.7 system	Do not use this system Use the z/OS 1.7 system

\	Processor Support System z/OS 1.4 - 1.6	Other systems z/OS 1.7 with 2094 support	Other systems without 2094 support
Operation / Condition	z/0S 1.4 -1.6	z/0S 1.7	z/0S 1.4 - 1.6
2094 z/OS Support	2094 Support Installed SS-1 S/W UCBs cannot be defined SS-1 H/W subchannels cannot be defined	Full 2094 Support installed SS-1 S/W Support SS-1 UCBs not defined SS-1 H/W Support SS-1 subchannels not defined	2094 support Not installed No SS-1 S/W Support No SS-1 H/W Support
Installed system HCD level	z/OS HCD 1.4	z/OS HCD 1.7	z/OS HCD 1.4
Processor IODF Used for IOCP / IOCDS	z/OS HCD 1.4 IODF Version 4	z/OS HCD 1.4 IODF Version 4	z/OS HCD 1.4 IODF Version 4
IPL Support Version 5 IODF	Yes - but n/a using version 4 IODF	Yes - but n/a using version 4 IODF	No - but n/a using version 4 IODF
OSCONFIG IODF	z/OS HCD 1.4 IODF Version 4 LOADxx = ** OSCONFIG = CPC + LP	z/OS HCD 1.4 IODF Version 4 LOADxx = ** OSCONFIG = CPC + LP	z/OS HCD 1.4 IODF Version 4 LOADxx = ** OSCONFIG = CPC + LP
IPL and use the IODF / OSCONFIG for this Image	Yes Version 4 IODF	Yes Version 4 IODF	Yes Version 4 IODF
View the IPL'd IODF	Yes	??? Yes, be careful of IODF conversion	Yes, but this system does not support the 2094
IOCP Program	ICPIOCP V1 R3 z/OS 1.4-1.6	ICPIOCP V1 R3 z/OS 1.4-1.6	ICPIOCP V1 R3 z/OS 1.4-1.6
2094 IOCDS Source	z/OS 1.4-1.6 w/ 2094 Support	z/OS 1.4-1.6 w/ 2094 Support	z/OS 1.4-1.6 w/ 2094 Support
2094 Processor or I/O Configuration H/W definition Change	Yes Use this z/OS 1.4-1.6 System	Yes Use the z/OS 1.4-1.6 System	Yes, use the z/OS 1.4-1.6 2094 support system
I/O Configuration S/W definition Change	Yes Use this z/OS 1.4-1.6	Not from this system, use the z/OS 1.4-1.6 system	Yes, use the z/OS 1.4-1.6 2094 support system
Dynamic Software change	Yes using the version 4 IODF	Yes using the version 4 IODF	Yes using the version 4 IODF
Dynamic Hardware change	Yes - But No SS-1 H/W support	? Not from this system, use the z/OS 1.4-1.6 system	Yes, use the z/OS 1.4-1.6 2094 support system

\	Processor Support Standalone IOCP IOCP V1 R3
Operation / Condition	z/0S 1.4 -1.6
2094 z/OS Support	2094 support Not installed No SS-1 S/W Support SS-1 H/W Support
Installed system HCD level	z/OS HCD 1.4
Processor IODF Used for IOCP / IOCDS	none using IOCP S/A
IPL Support Version 5 IODF	No But using version 4
OSCONFIG IODF	z/OS HCD 1.4 IODF Version 4 LOADxx= Hardcoded OSCONFIG = CPC + LP
IPL and use the IODF / OSCONFIG for this Image	Yes Version 4 IODF Hardcoded in the LOADxx
View the IPL'd IODF	Yes Version 4
IOCP Program	2094 Standalone ICPIOCP V1 R3
2094 IOCDS Source	2094 Standalone IOCP
2094 Processor or I/O Configuration H/W deffinition Change	Use 2094 Standalone IOCP
I/O Configuration S/W deffinition Change	Yes, using z/OS 1.4-1.6 system
Dynamic Hardware change	No
Dynamic Software change	Yes using the version 4 IODF

IBM System z9 109 - 2094
I/O Configuration Support - Installation
Subchannel Sets -
Alias Device Support, 2094 and z/OS
End of Presentation - Part 3a

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

- Display I/O device list
  - There are a number of different ways to display a device list
    - IODF
    - Processor
    - Partition
    - Channel
    - CU

Display I/O Device List by CU (CU 1000)

```
                              I/O Device List          Row 1 of 1 More:       >
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more devices, then press Enter. To add, use F11.

Control unit number  : 1000     Control unit type  . : 2105

  ----------Device------ --#--- --------Control Unit Numbers + --------
/ Number   Type +        CSS OS 1--- 2--- 3--- 4--- 5--- 6--- 7--- 8---
_ 1000,128 3390B         4   3  1000 ____ ____ ____ ____ ____ ____ ____
******************************* Bottom of data ********************************
```

Display I/O Device List by IODF

```
                              I/O Device List          Row 1 of 3 More:       >
Command ===> ____________________________________________ Scroll ===> PAGE

Select one or more devices, then press Enter. To add, use F11.

  ----------Device------ --#--- --------Control Unit Numbers + --------
/ Number   Type +        CSS OS 1--- 2--- 3--- 4--- 5--- 6--- 7--- 8---
_ 0061     2032                 0061 ____ ____ ____ ____ ____ ____ ____
_ 0062     2032                 0062 ____ ____ ____ ____ ____ ____ ____
_ 1000,128 3390B         4   3  1000 ____ ____ ____ ____ ____ ____ ____
******************************* Bottom of data ********************************
```

z9 109 - 2094
I/O Configuration Support - Installation
Subchannel Sets -
Alias Device Support, 2094 and z/OS
End of Presentation - Part 3b

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zSeries Channel Development
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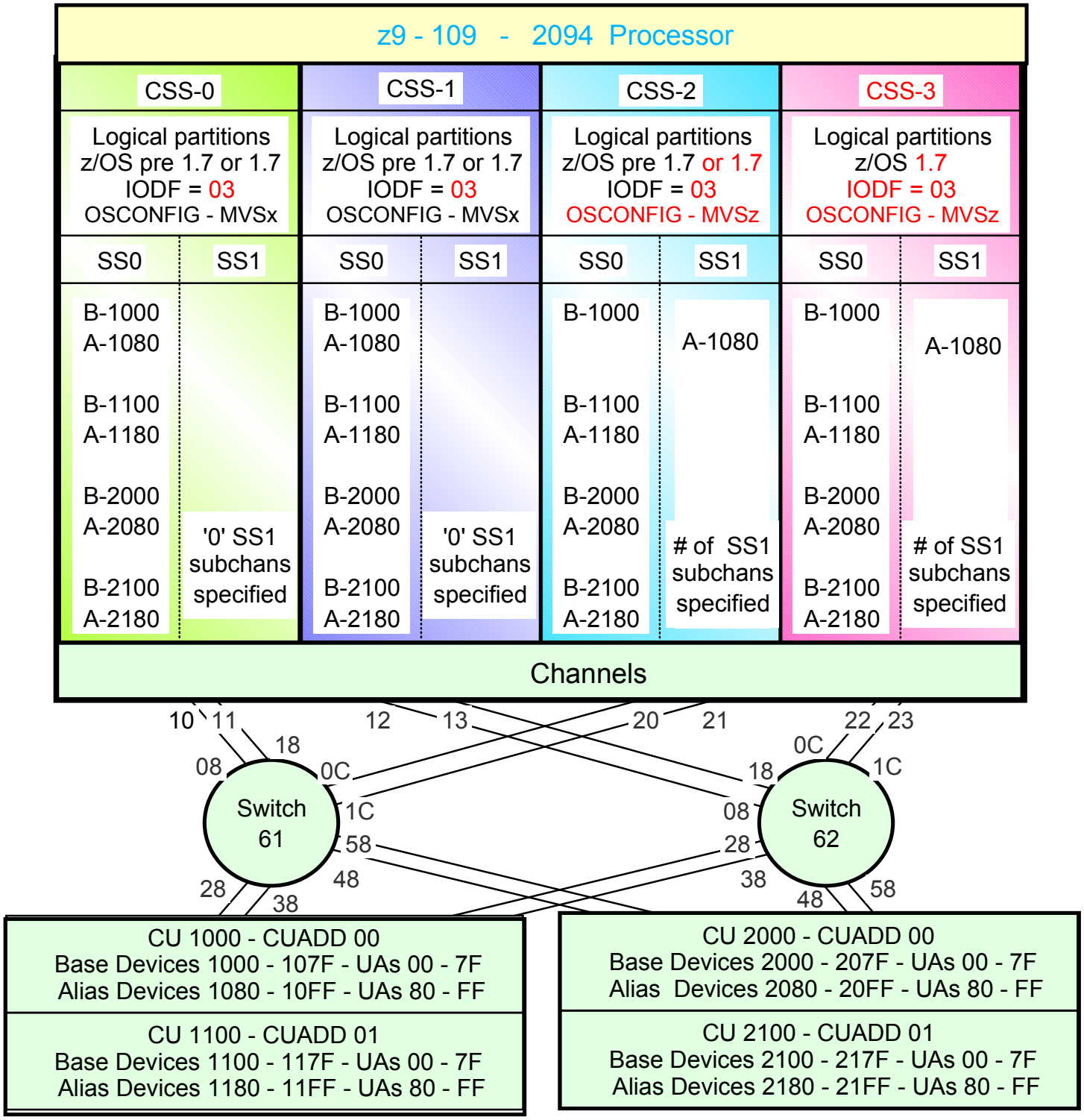
IBM System z9 109 - 2094
I/O Configuration Definition Support

HCD - IOCP - HCM CMT - Dynamic I/O Reconfiguration

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005



- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

PROC.id - TEST2094 -IOCP Listing

```
ID    MSG2='TROWELL.IODF8F - 2005-03-25 09:07',                *
      SYSTEM=(2094,1),                                         *
      TOK=('TEST2094',008001136A3A208409072639010508 4F00000000*
      ,00000000,'05-03-25','09:07:26','TROWELL','IODF8F')
RESOURCE PARTITION=((CSS(0),(LP1,1),(LP2,2),(LP3,3)),(CSS(1),(*
      LPA,1),(LPB,2),(LPC,3),(LPD,4)),(CSS(2),(LPL,1),(LPM,2),*
      (LPN,3),(LPO,4),(LPP,5)),(CSS(3),(LPS,1),(LPT,2),(LPU,3)*
      ,(LPV,4),(LPW,5),(LPX,6))),                              *
      MAXDEV=((CSS(0),64512,0),(CSS(1),64512,0),(CSS(2),64512,*
      32000),(CSS(3),64512,32000))
CHPID PATH=(CSS(0,1,2,3),10),SHARED,SWITCH=61,PCHID=100,       *
      TYPE=FC
CHPID PATH=(CSS(0,1,2,3),11),SHARED,SWITCH=61,PCHID=110,       *
      TYPE=FC
CHPID PATH=(CSS(0,1,2,3),12),SHARED,SWITCH=62,PCHID=120,       *
      TYPE=FC
CHPID PATH=(CSS(0,1,2,3),13),SHARED,SWITCH=62,PCHID=130,       *
      TYPE=FC
CHPID PATH=(CSS(0,1,2,3),20),SHARED,SWITCH=61,PCHID=200,       *
      TYPE=FC
CHPID PATH=(CSS(0,1,2,3),21),SHARED,SWITCH=61,PCHID=210,       *
      TYPE=FC
CHPID PATH=(CSS(0,1,2,3),22),SHARED,SWITCH=62,PCHID=220,       *
      TYPE=FC
CHPID PATH=(CSS(0,1,2,3),23),SHARED,SWITCH=62,PCHID=230,       *
      TYPE=FC
```

PROC.id - TEST2094 -IOCP Listing - cont...

```
CNTLUNIT CUNUMBR=0061,                                          *
      PATH=((CSS(0),10),(CSS(1),10),(CSS(2),10),(CSS(3),10)),   *
      UNITADD=((00,001)),                                       *
      LINK=((CSS(0),FE),(CSS(1),FE),(CSS(2),FE),(CSS(3),FE)),   *
      UNIT=2032
IODEVICE ADDRESS=061,UNITADD=00,CUNUMBR=(0061),STADET=Y,        *
      UNIT=2032

CNTLUNIT CUNUMBR=0062,                                          *
      PATH=((CSS(0),12),(CSS(1),12),(CSS(2),12),(CSS(3),12)),   *
      UNITADD=((00,001)),                                       *
      LINK=((CSS(0),FE),(CSS(1),FE),(CSS(2),FE),(CSS(3),FE)),   *
      UNIT=2032
IODEVICE ADDRESS=062,UNITADD=00,CUNUMBR=(0062),STADET=Y,        *
      UNIT=2032
```

PROC.id - TEST2094 -IOCP Listing - cont...

```
CNTLUNIT CUNUMBR=1000,                                          *
      PATH=((CSS(0),10,11,12,13),(CSS(1),10,11,12,13),(CSS(2),*
      10,11,12,13),(CSS(3),10,11,12,13)),UNITADD=((00,256)),   *
      LINK=((CSS(0),28,38,28,38),(CSS(1),28,38,28,38),(CSS(2),*
      28,38,28,38),(CSS(3),28,38,28,38)),CUADD=0,UNIT=2105
IODEVICE ADDRESS=(1000,128),CUNUMBR=(1000),STADET=Y,UNIT=3390B
IODEVICE ADDRESS=(1080,128),CUNUMBR=(1000),STADET=Y,            *
      SCHSET=((CSS(2),1),(CSS(3),1)),UNIT=3390A

CNTLUNIT CUNUMBR=1100,                                          *
      PATH=((CSS(0),10,11,12,13),(CSS(1),10,11,12,13),(CSS(2),*
      10,11,12,13),(CSS(3),10,11,12,13)),UNITADD=((00,256)),   *
      LINK=((CSS(0),28,38,28,38),(CSS(1),28,38,28,38),(CSS(2),*
      28,38,28,38),(CSS(3),28,38,28,38)),CUADD=1,UNIT=2105
IODEVICE ADDRESS=(1100,128),CUNUMBR=(1100),STADET=Y,UNIT=3390B
IODEVICE ADDRESS=(1180,128),CUNUMBR=(1100),STADET=Y,UNIT=3390A

CNTLUNIT CUNUMBR=2000,                                          *
      PATH=((CSS(0),10,11,12,13),(CSS(1),10,11,12,13),(CSS(2),*
      10,11,12,13),(CSS(3),10,11,12,13)),UNITADD=((00,256)),   *
      LINK=((CSS(0),48,58,48,58),(CSS(1),48,58,48,58),(CSS(2),*
      48,58,48,58),(CSS(3),48,58,48,58)),CUADD=0,UNIT=2105
IODEVICE ADDRESS=(2000,128),CUNUMBR=(2000),STADET=Y,UNIT=3390B
IODEVICE ADDRESS=(2080,128),CUNUMBR=(2000),STADET=Y,UNIT=3390A

CNTLUNIT CUNUMBR=2100,                                          *
      PATH=((CSS(0),10,11,12,13),(CSS(1),10,11,12,13),(CSS(2),*
      10,11,12,13),(CSS(3),10,11,12,13)),UNITADD=((00,256)),   *
      LINK=((CSS(0),48,58,48,58),(CSS(1),48,58,48,58),(CSS(2),*
      48,58,48,58),(CSS(3),48,58,48,58)),CUADD=1,UNIT=2105
IODEVICE ADDRESS=(2100,128),CUNUMBR=(2100),STADET=Y,UNIT=3390B
IODEVICE ADDRESS=(2180,128),CUNUMBR=(2100),STADET=Y,UNIT=3390A
```

OSCONFIG - MVSX - Listing

```
    TITLE 'TROWELL.IODF8F.WORK - 2005-03-24 15:11:24  '

     IOCONFIG ID=00,NAME=MVSX,TYPE=MVS
     IODEVICE ADDRESS=(0061,1),UNIT=2032,OFFLINE=YES,DYNAMIC=YES,   *
           LOCANY=NO,CUNUMBR=0061
     IODEVICE ADDRESS=(0062,1),UNIT=2032,OFFLINE=YES,DYNAMIC=YES,   *
           LOCANY=NO,CUNUMBR=0062
     IODEVICE ADDRESS=(1000,128),UNIT=3390B,FEATURE=SHARED,         *
           OFFLINE=NO,DYNAMIC=YES,LOCANY=NO,USERPRM=((WLMPAV,YES)),*
           CUNUMBR=1000
     IODEVICE ADDRESS=(1080,128),UNIT=3390A,USERPRM=((WLMPAV,YES)),*
           CUNUMBR=1000
     EDT ID=01
```

OSCONFIG - MVSZ - Listing

```
TITLE 'TROWELL.IODF8F.WORK - 2005-03-24 15:11:24  '

 IOCONFIG ID=00,NAME=MVSZ,TYPE=MVS
 IODEVICE ADDRESS=(0061,1),UNIT=2032,OFFLINE=YES,DYNAMIC=YES,   *
       LOCANY=NO,CUNUMBR=0061
 IODEVICE ADDRESS=(0062,1),UNIT=2032,OFFLINE=YES,DYNAMIC=YES,   *
       LOCANY=NO,CUNUMBR=0062
 IODEVICE ADDRESS=(1000,128),UNIT=3390B,FEATURE=SHARED,         *
       OFFLINE=NO,DYNAMIC=YES,LOCANY=NO,USERPRM=((WLMPAV,YES)),*
       CUNUMBR=1000
 IODEVICE ADDRESS=(1080,128),UNIT=3390A,SCHSET=1,               *
       USERPRM=((WLMPAV,YES)),CUNUMBR=1000
 EDT ID=01
```

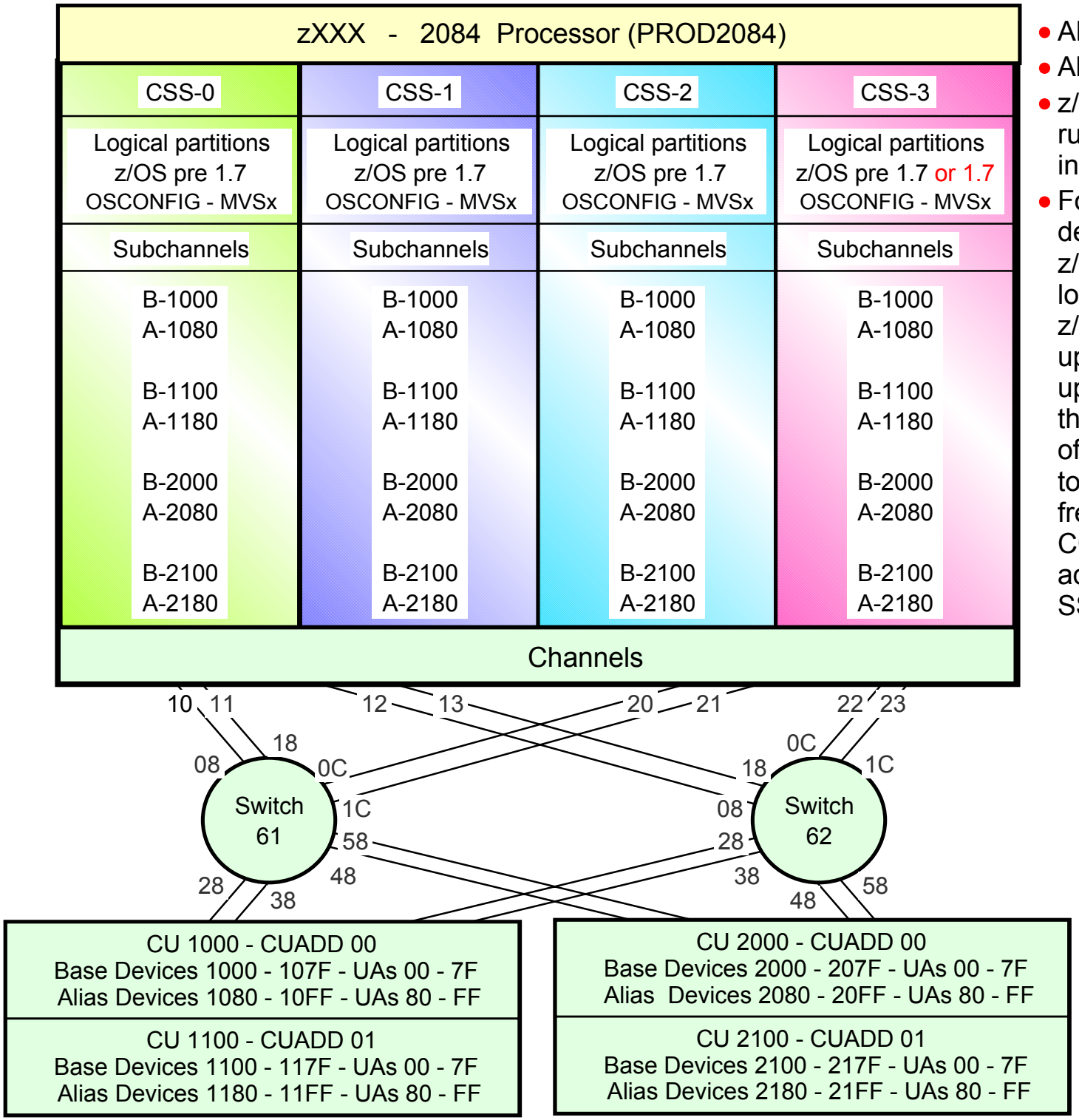
IBM System z9 109 - 2094
IOCP and OSCONFIG - Statements

End of Presentation

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

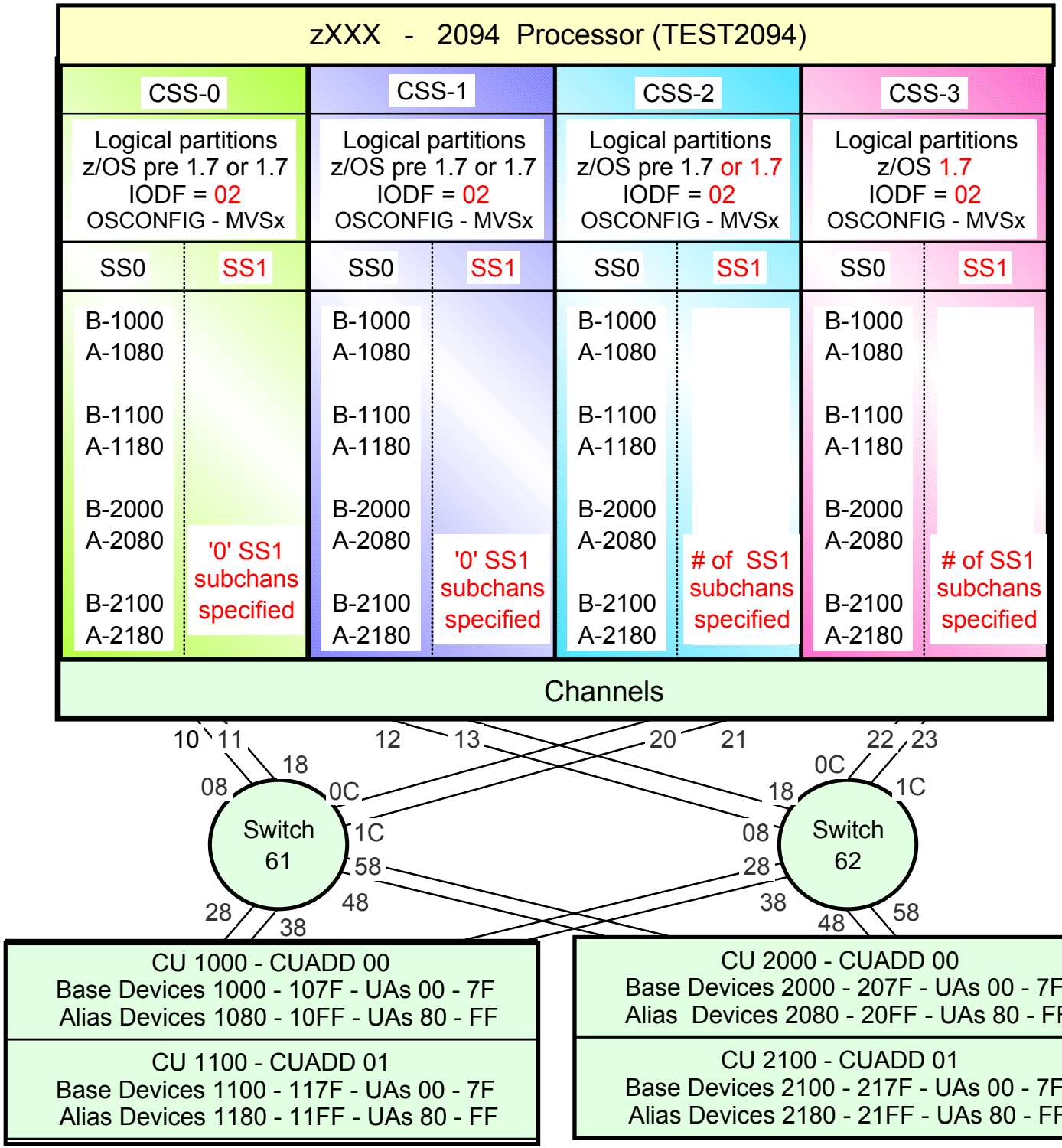
zSeries 2094 Danu
Dynamic I/O Reconfiguration Support
Subchannel Sets - Alias Device Support
Alias Device - SS0 to SS1 Movement

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005



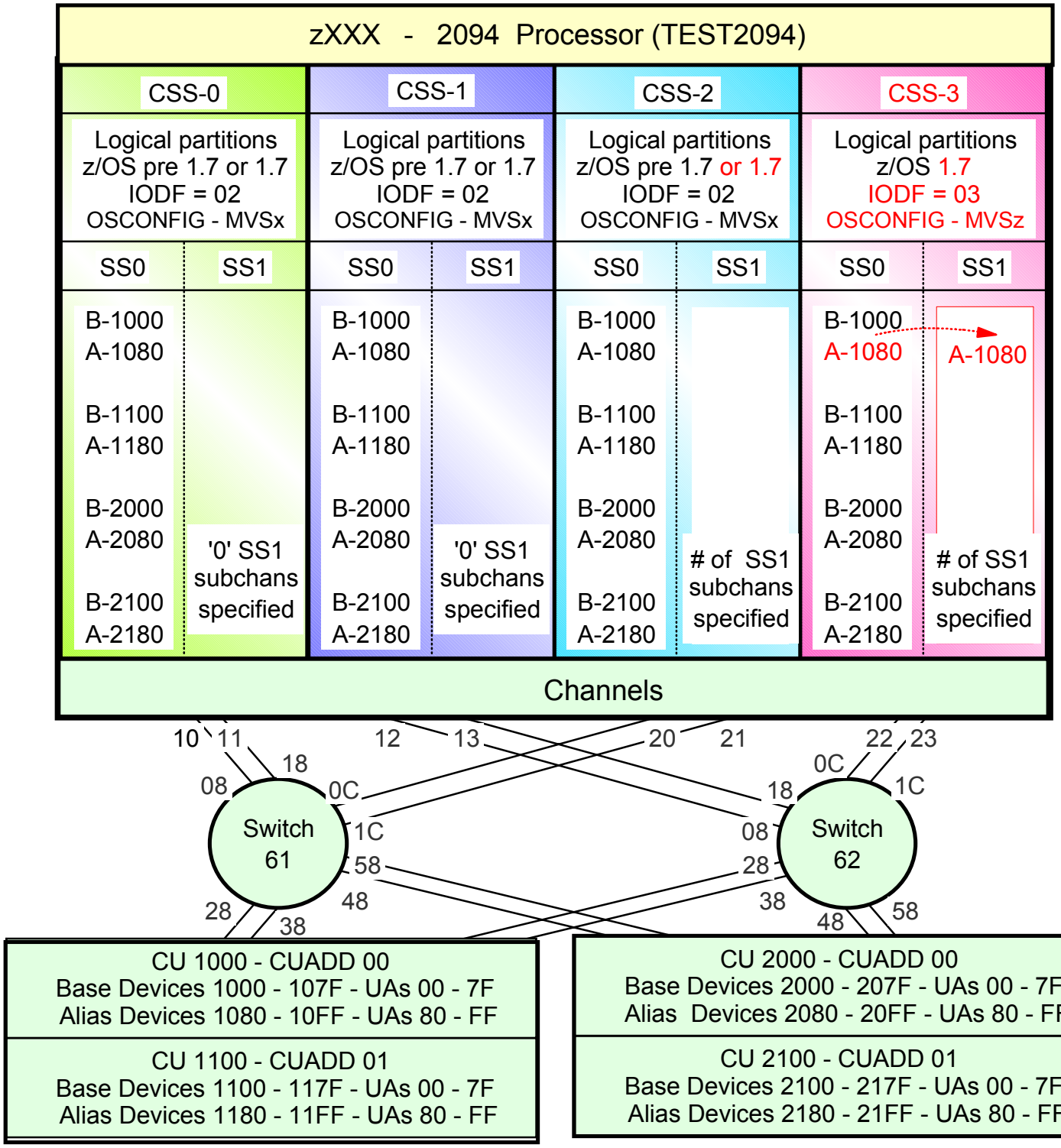
- All Bases are defined in CSS 0, 1, 2,3
- All Aliases are defined in CSS 0, 1, 2,3
- z/OS 1.7 has been installed and is running in at least one logical partition in any of the CSSs
- For this example either CSS3 is not defined in the 2084 or if defined the z/OSs running in the 2084 CSS3 logical partitions will be ungraded to z/OS 1.7 prior to a 2084 to 2094 upgrade or when the 2084 is MES upgraded to a 2094. This is to allow the z/OS 1.7 to exploit the movement of Alias devices on the 2094 from SS0 to a SS1 in the 2094 CSS-3 and freeing up subchannels in the 2094 CCS-3 SS0 for the definition of additional Base devices in 2094 CSS-3 SS0.
  - Note: Once the Alias devices are defined in SS1 in a 2094 CSS all z/OSs running in logical partitions in that 2094 CSS must be at z/OS 1.7 or later to be able to access the Alias subchannels in that 2094 CSSs SS1 (covered later in this presentation).
    - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

Processor = TEST2094 I/O Configuration Definition Support



- 2094 configuration with MCSS (Multiple Channel Subsystems) and Multiple Subchannel Sets (MSS)
- MSS is new with the 2094 zSeries processor
- With z/OS 1.7 alias devices may be placed in SS1 instead of SS0
- This allows all the subchannels in SS0 to be used in support of Base DASD devices and other devices (non-DASD)
- z/OS 1.7 will support Alias devices defined in either SS0 or SS1
  - Note aCSS alias device (CI-D_ID-CUI-UA) can only be defined in one Subchannel set within a CSS
- z/OS pre 1.7 only supports/uses alias devices that are defined in SS0
- An Alias devices can be defined in SS0 in one CSS and SS1 in another CSS
- This example shows Alias devices defined in SS0 in all of the CSSs. Either z/OS pre .7 or z/OS 1.7 may be used in any partition in any CSS.
  - At least one partition MUST have z/OS 1.7
- Note: This configuration only requires one Processor definition (PROC.id) and may require only one OSCONFIG definition
  - OSCONFIG - MVSx
- There is no Base device relieve in SS0 as all Alias devices are still defined in SS0 in each of the CSSs
- Reset activate IOCDS source = xxx.IODF02
- IPL Source IODF = xxxx.IODF02
- IPL OSCONFIG id = MVSx
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

Processor = TEST2094 (Alias devices 1080-10FF - *CSS3 Subchannel Set H/W and S/W definition change*)

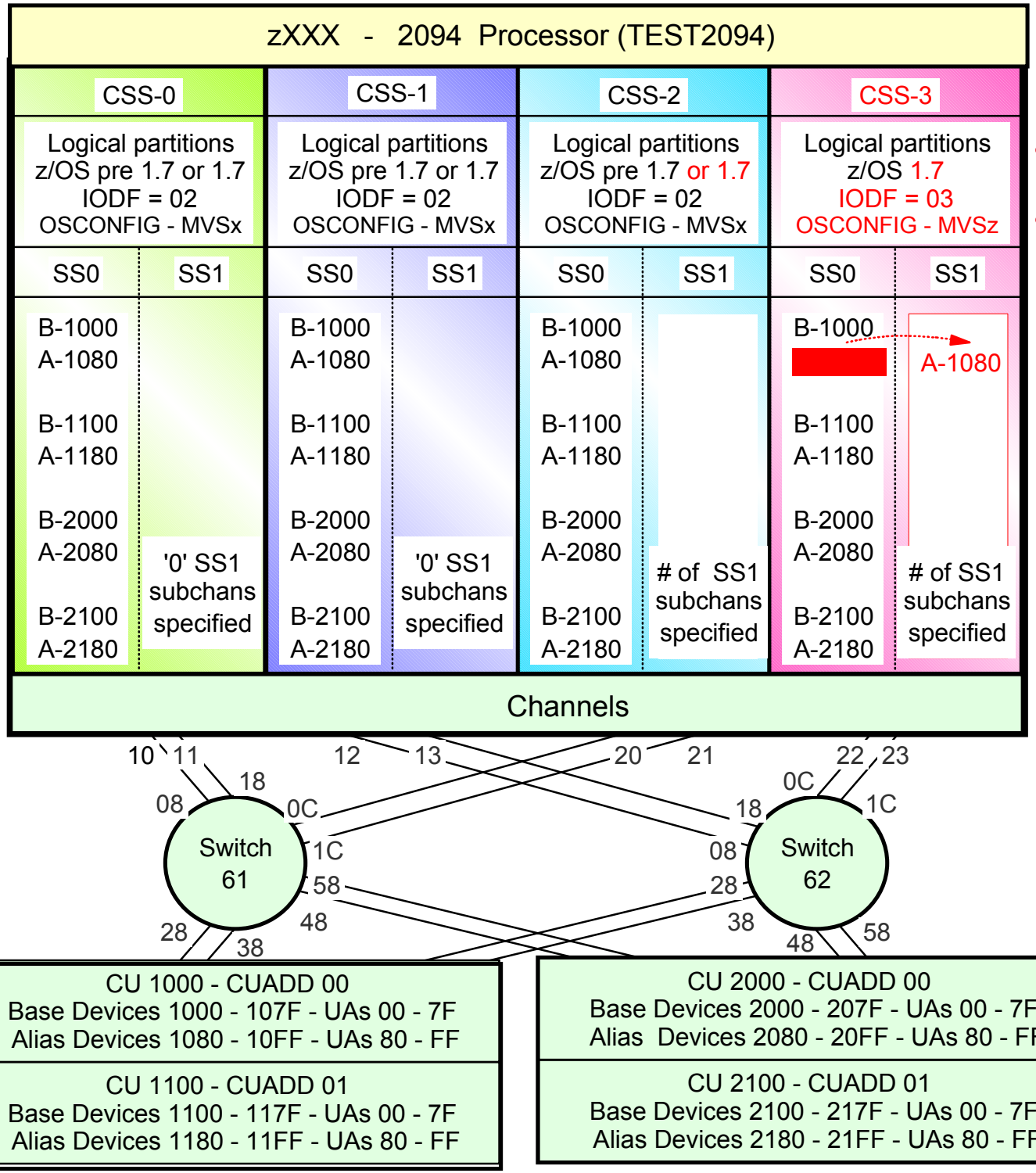


- All Bases in all CSSs are in SS0
- Initially all Aliases in all CSSs are in SS0
- CSS-3 Alias Device subchannel definitions for alias devices in CUs 1100, 2000 and 2100 will remain defined in SS0
- Using a new work IODF
  - IODF = xxxx.IODF03.work
  - Proc.id name of TEST2094 does not change
- Proc.id TEST2094 CSS-3 Alias Device Subchannel definitions for alias devices in CU 1000 are moved from SS0 to SS1
- A new OSCONFIG 'MVSz' has been created for z/OS 1.7 systems running in logical partitions in CSS-3.
  - OSCONFIG MVSz was copied from the active current OSCONFIG (MVSx)
- Aliases device OSCONFIG MVSz definitions for alias devices in CSS-3 in CU 1000 have been moved from SS0 to SS1. They are still defined as alias device numbers 1080 to 10FF but in SS1
- Create a new production IODF
  - xxxx.IODF03

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

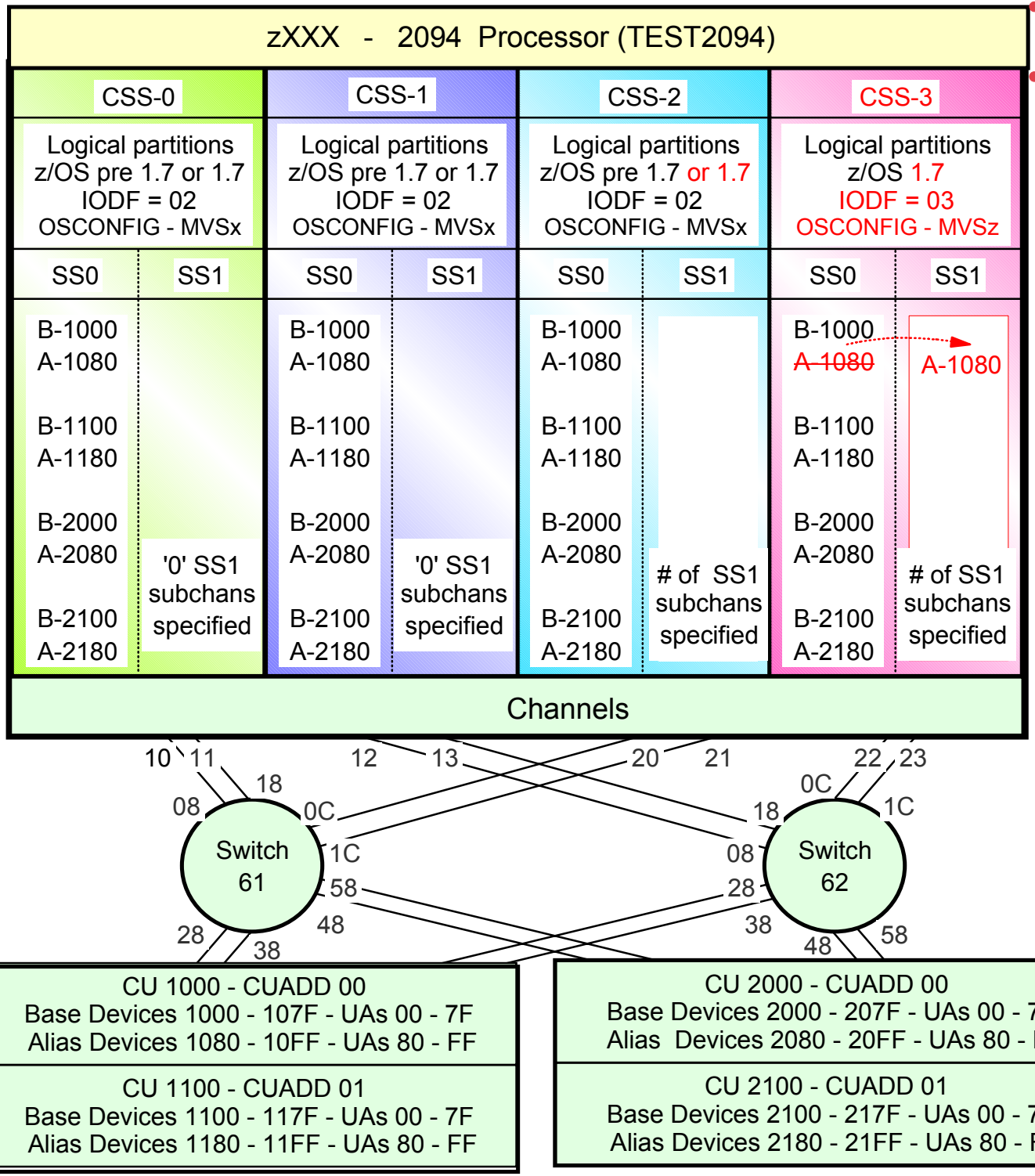
zSeries zXXX 2094 - Dynamic I/O Reconfiguration Support

Processor = TEST2094 (Alias devices 1080-10FF - *Subchannel Set Dynamic I/O activation* - *software change*)



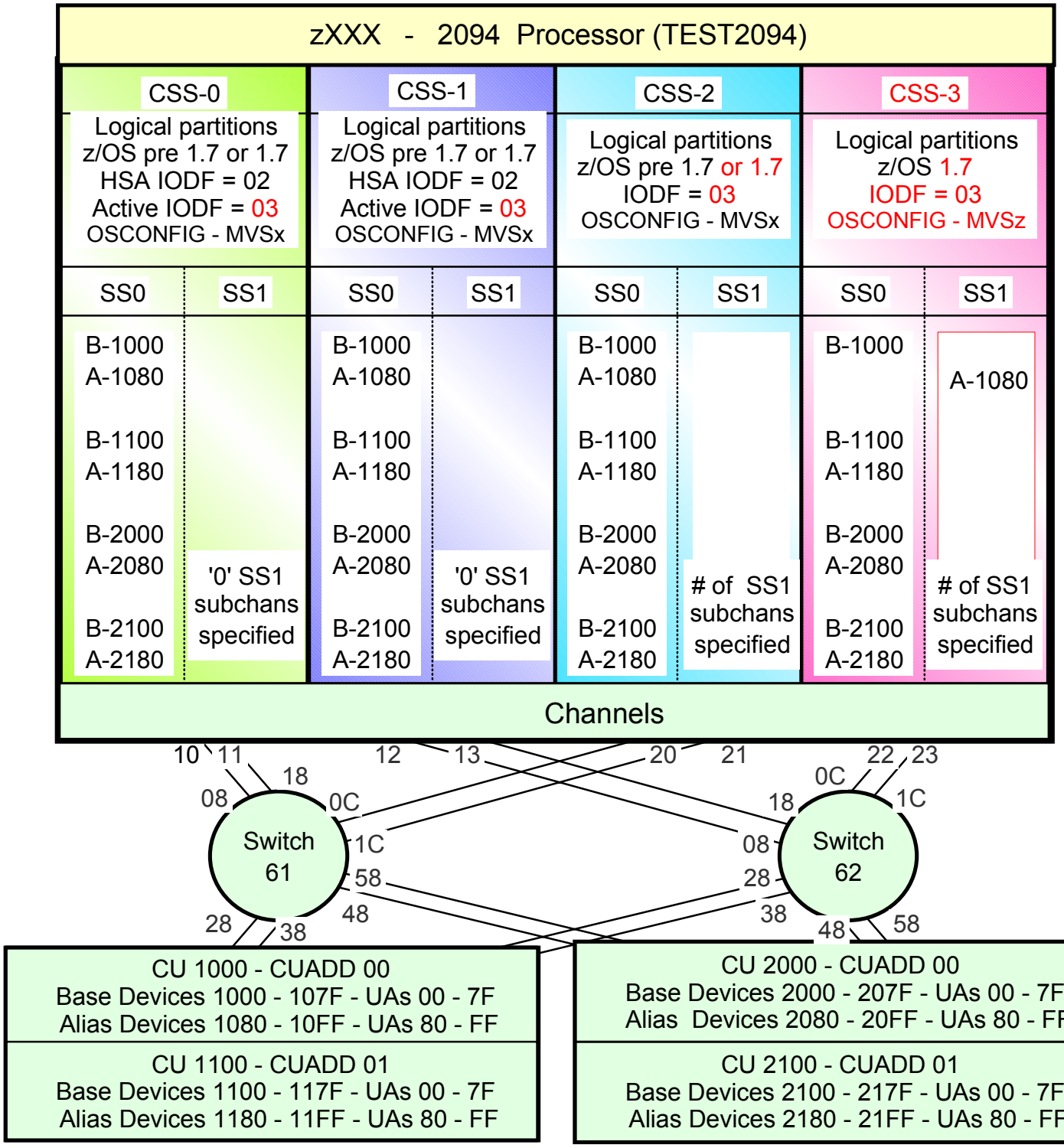
- A software only activate is performed in all partitions in CSS-3 (except one)
- Software only target IODF and OSCONFIG
  - Target IODF = xxxx.IODF03
  - The active OSCONFIG will be changed from MVSx (source) to MVSz (target)
  - Note:
  - 1.z/OS will wait for upto 10 seconds for outstanding I/O operations on Alias device CUBs 1080 to 10FF to complete in the z/OS partition, then the I/O outstanding I/O completes the aliases will be unbound from their current base and then these SS0 Alias UCBs will be deleted
  - 2. SS1 UCBs for Alias devices 1080 to 10FF will be added for these CSS3 logical partitions but marked as not connected to a subchannel, (nor will these Alias device UCBs be bound to a Base UCB at this time)
  - .If the outstanding alias operations do not complete in 10 seconds during the activate request, the dynamic I/O reconfiguration activate request will fail. .
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

Processor = TEST2094 (Alias devices 1080-10FF - *Subchannel Set Dynamic I/O activation - hardware change*)



- A hardware / software activate is performed in the last CSS-3 partition
- Hardware target IODFand software OSCONFIG are:
  - Target IODF = xxxx.IODF03
  - Proc.id name of TEST2094, does not change
  - Target OSCONFIG = MVSz
  - Note: The software change is performed first as per the previous foil, then...
  - 1. Device numbers for Alias devices 1080 to 10FF in CSS-3 will be deleted from SS0 subchannels (i.e. marked not valid)
  - 2. All partitions in CSS-3 will be informed that SS0 Alias subchannels that use to support alias devices 1080-10FF have been changed (via the CRW process) (technically the device number in the subchannel has been marked not valid)
  - 3. All partitions in CSS-3 will be informed that SS1 subchannels to support alias devices 1080-10FF have been changed (via the CRW process) (technically the device number is added in the subchannel and is marked as valid)
  - 4. z/OS in each CSS-3 partition will try and map the SS1 subchannel alias device number to an SS1 UCB alias device number .
  - 5. z/OS will determine the current state of these alias devices (UCBs) and bind them to their associated base UCBs
  - Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

Processor = TEST2094 (Alias devices 1080-10FF - *Subchannel Set Dynamic I/O activation* - synchronization)



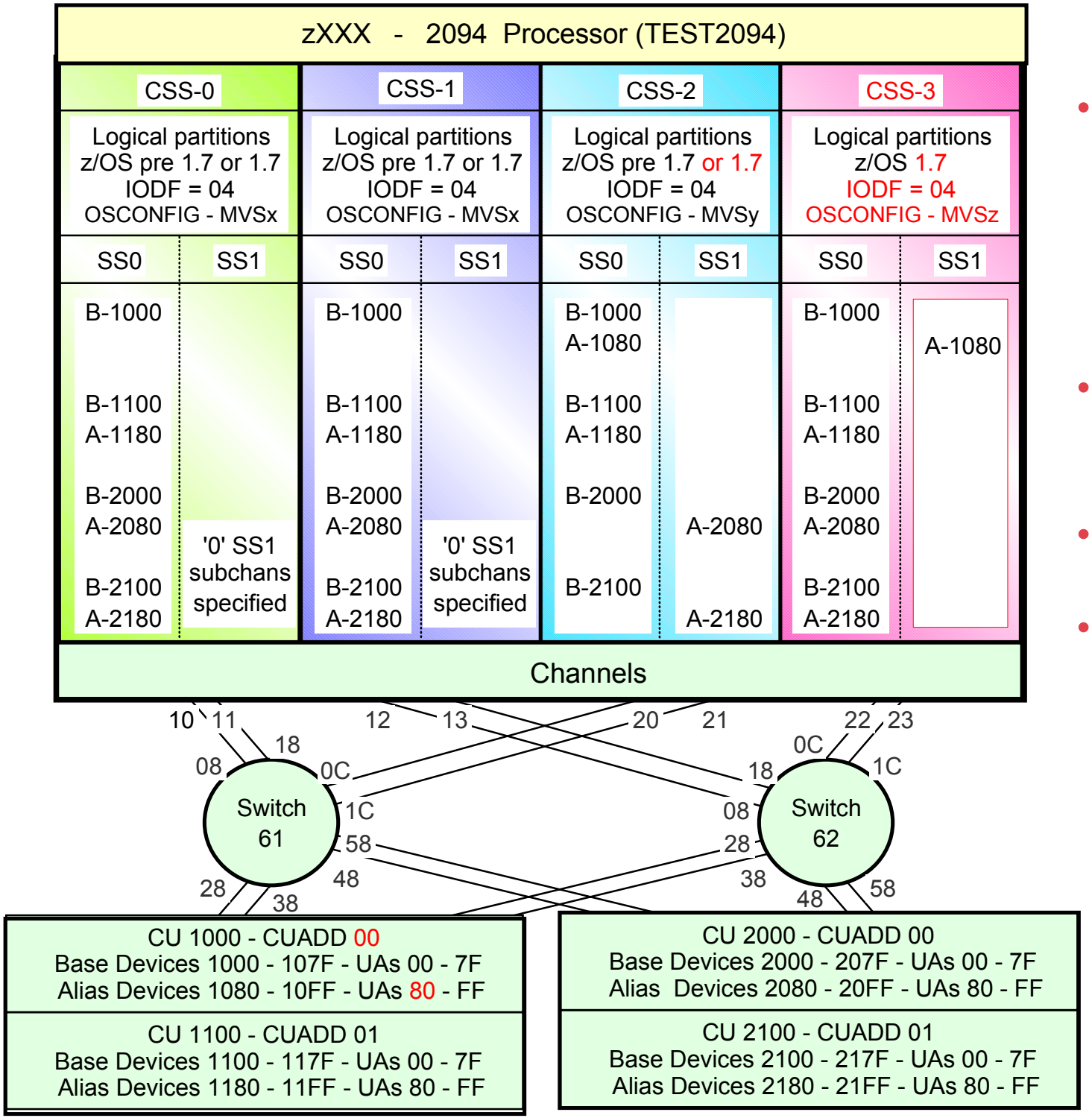
- The active IODF in CSS3 Logical Partitions is:
  - IODF = xxxx.IODF03
- The Proc.ID in HSA for the 2094 is:
  - Proc.id = TEST2094
- The active OSCONFIG in CSS-3 LPs is:
  - OSCONFIG = MVSz
- If the customer wishes to keep all the other TEST2094 logical partitions' hardware and software dynamic I/O reconfiguration in sync in CSS-0, CSS-1, CSS-2, the customer can perform a 'software only activate' in each of these logical partitions in CSS-0, CSS-1, CSS-2
  - ACTIVATE IODF03,SOFT or
  - ACTIVATE IODF=03,SOFT=NOVALIDATE (this needs to be checked)
  -

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

zSeries 2094 Danu
I/O Configuration Support
Subchannel Sets - Alias Device Support
Device Number Change

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

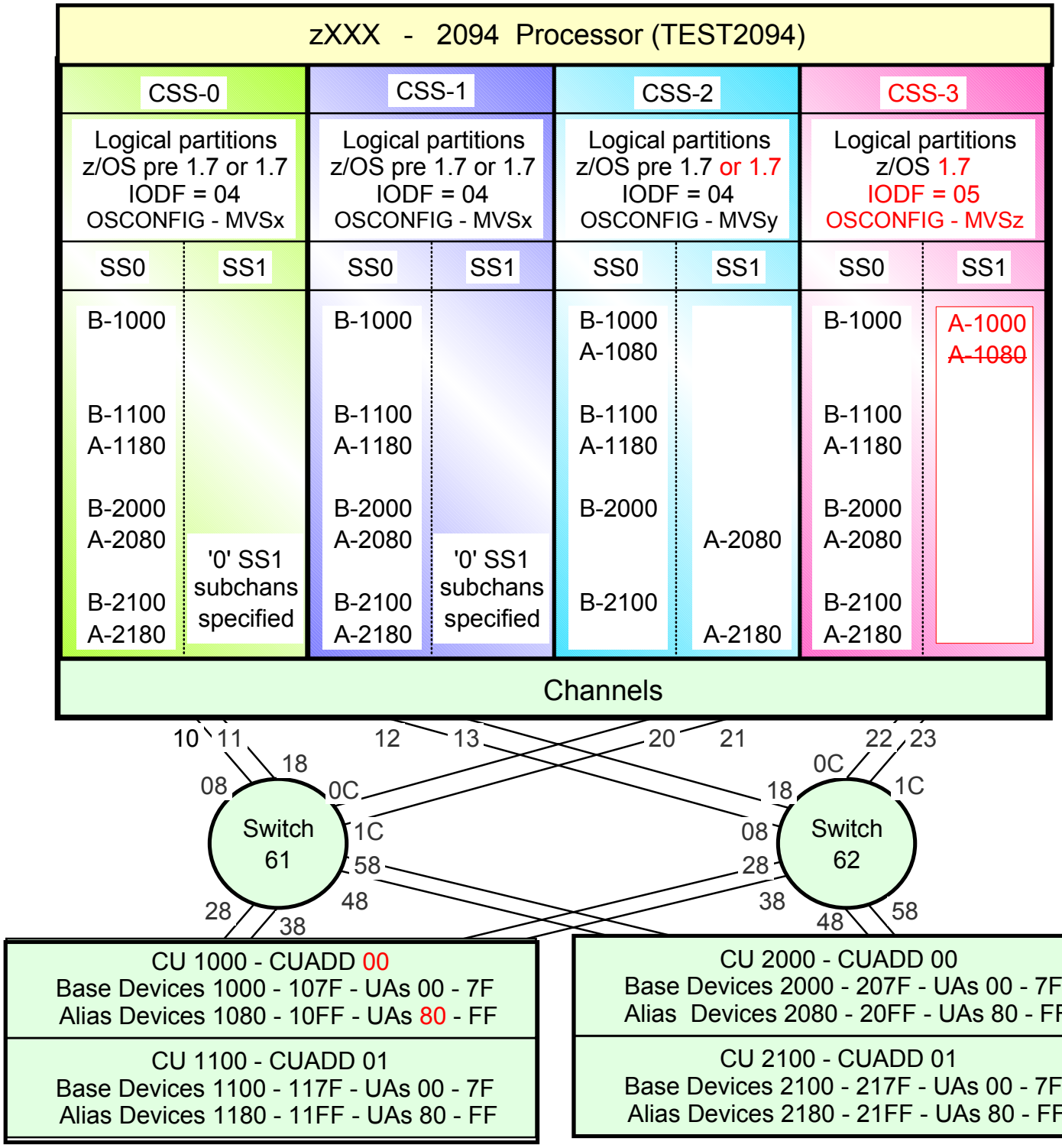
Processor = TEST2094 (Alias devices 1080-10FF - *Device number change*)



- As the second set of subchannels provides a second set of device numbers just like those provided for Base devices numbers, which can be any non-duplicated device number between 0000 and FFFF (in that subchannel set), the Alias device numbers in the second subchannel set can also be any non-duplicated device number (in that subchannel set) between 0000 and FFFF.
- An Alias device number in the second subchannel set (SS1) that matches a device number in the first subchannel set is NOT considered in the same sense as being a duplicate device number.
- There is no device number connection between the two subchannel sets (other than being defined to the .same CU)
- The only condition is that a logical/physical device UA assigned to a device number on a CU definition cannot be used twice in the same CSS. That means, the CUADD/Device UA cannot be defined to a device number in SS0 and also to a device number in SS1 of the same CSS

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

Processor = TEST2094 (Alias devices 1080-10FF - *Device number change*)



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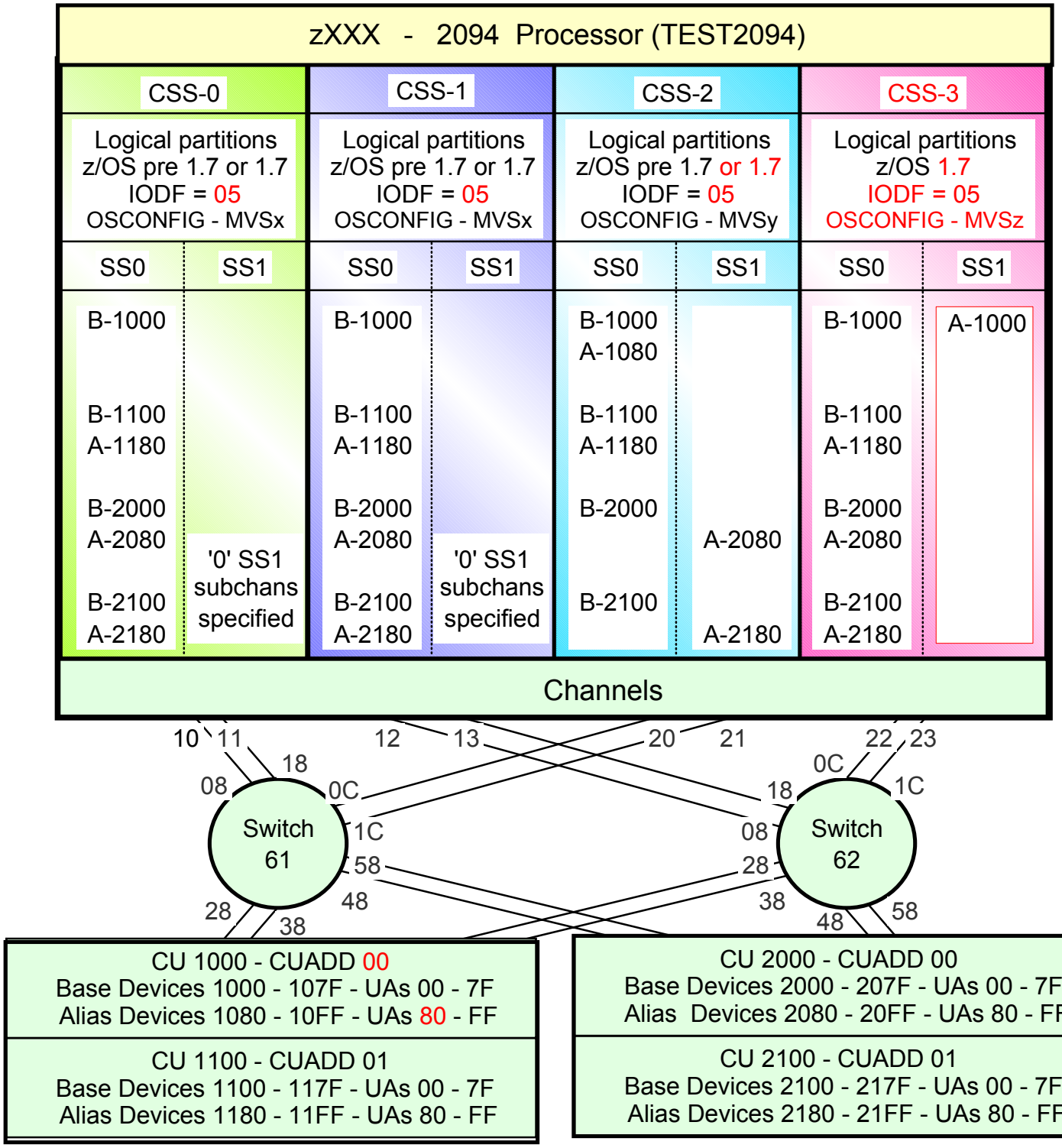
- An Alias device number in the second subchannel set (SS1) that matches a device number in the first subchannel set is NOT considered in the same sense as being a duplicate device number.
- There is no device number connection between the two subchannel sets (other than being defined to the .same CU)
- The only condition is that a logical/physical device UA assigned to a device number on a CU definition cannot be used twice in the same CSS. That means, the CUADD/Device UA cannot be defined to a device number in SS0 and also to a device number in SS1 of the same CSS

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

Processor = TEST2094 (Alias devices 1080-10FF - *Device number change*)



- As the second set of subchannels provides a second set of device numbers just like those provided for Base devices numbers, which can be any non-duplicated device number between 0000 and FFFF (in that subchannel set), the Alias device numbers in the second subchannel set can also be any non-duplicated device number (in that subchannel set) between 0000 and FFFF.
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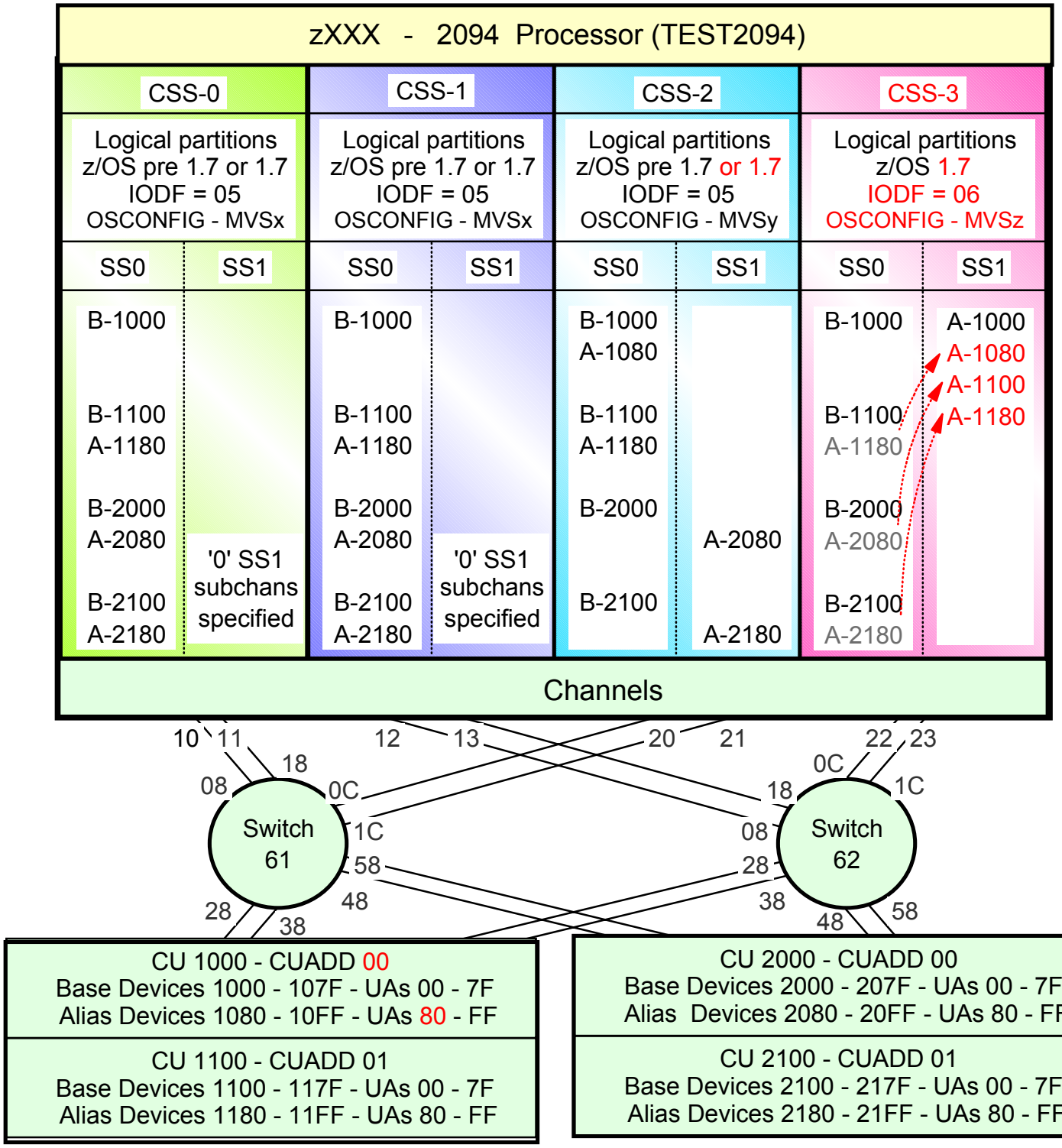
- There is no device number connection between the two subchannel sets (other than being defined to the .same CU)
- The only condition is that a logical/physical device UA assigned to a device number on a CU definition cannot be used twice in the same CSS. That means, the CUADD/Device UA cannot be defined to a device number in SS0 and also to a device number in SS1 of the same CSS

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

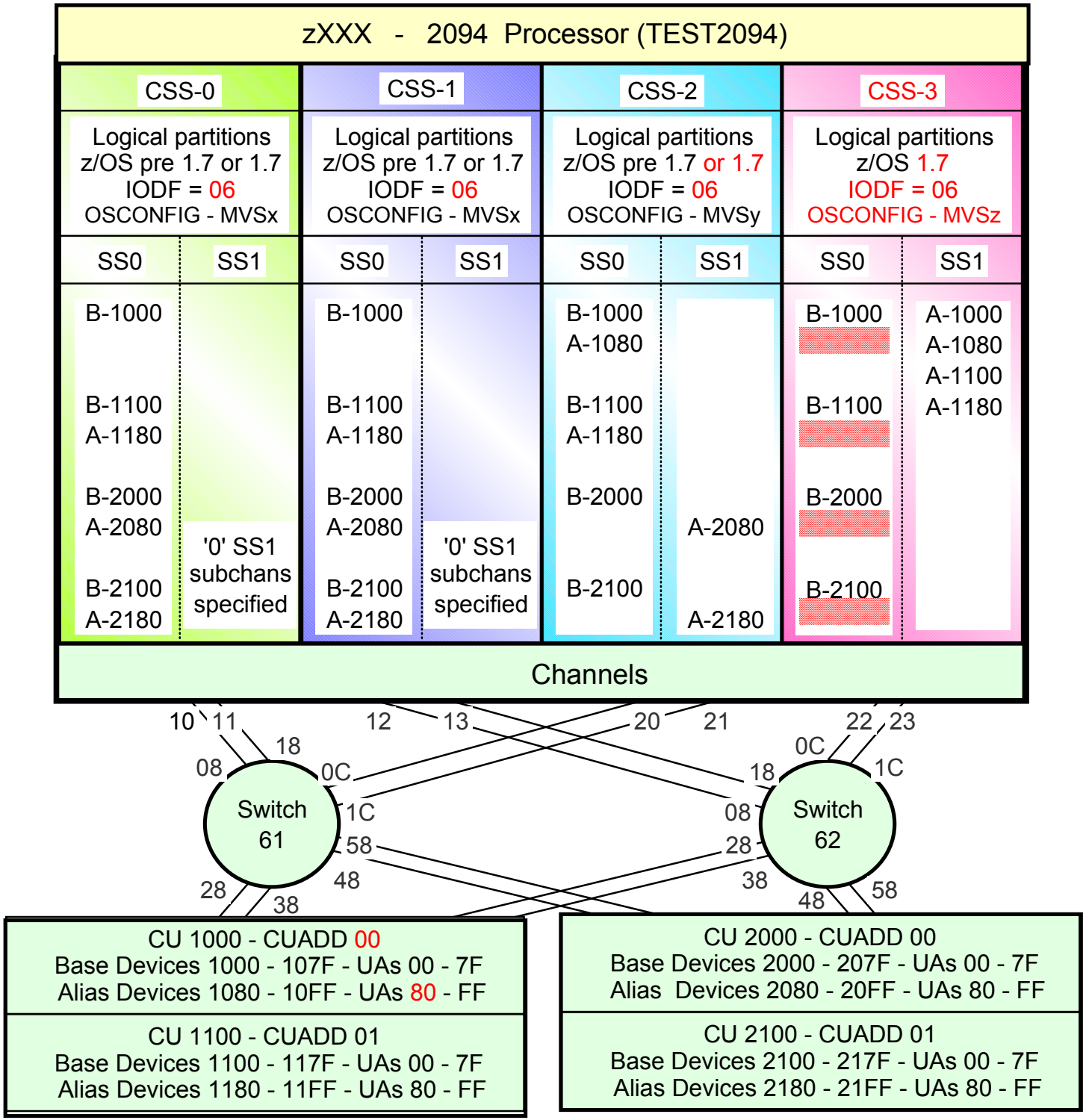
Processor = TEST2094 (*Alias device number movement and device number change*)



- As the second set of subchannels provides a second set of device numbers just like the Base devices numbers, which can be any non-duplicated device number between 0000 and FFFF, the Alias device numbers in the second subchannel set can also be any non-duplicated device number between 0000 and FFFF.
- An Alias device number in the second subchannel set that matches a device number in the first subchannel set is not considered as being a duplicate device number.
- There is no device number connection between the two subchannel sets.
- The only condition is that a logical/physical device UA assigned to a device number in a CU definition cannot be used twice in the same CSS. That means, the CU/Device UA cannot be defined to a device number in SS0 then also to another device number in SS1 of the same CSS
- Alias devices on CUs 1000, 1100, 2000, 2100 in CSS-3 SS0 are moved to CSS-3 SS1 and use different device numbers
- Dynamic I/O software and hardware activation is as previously stated

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

Processor = TEST2094 (*Alias device number movement and device number change*)



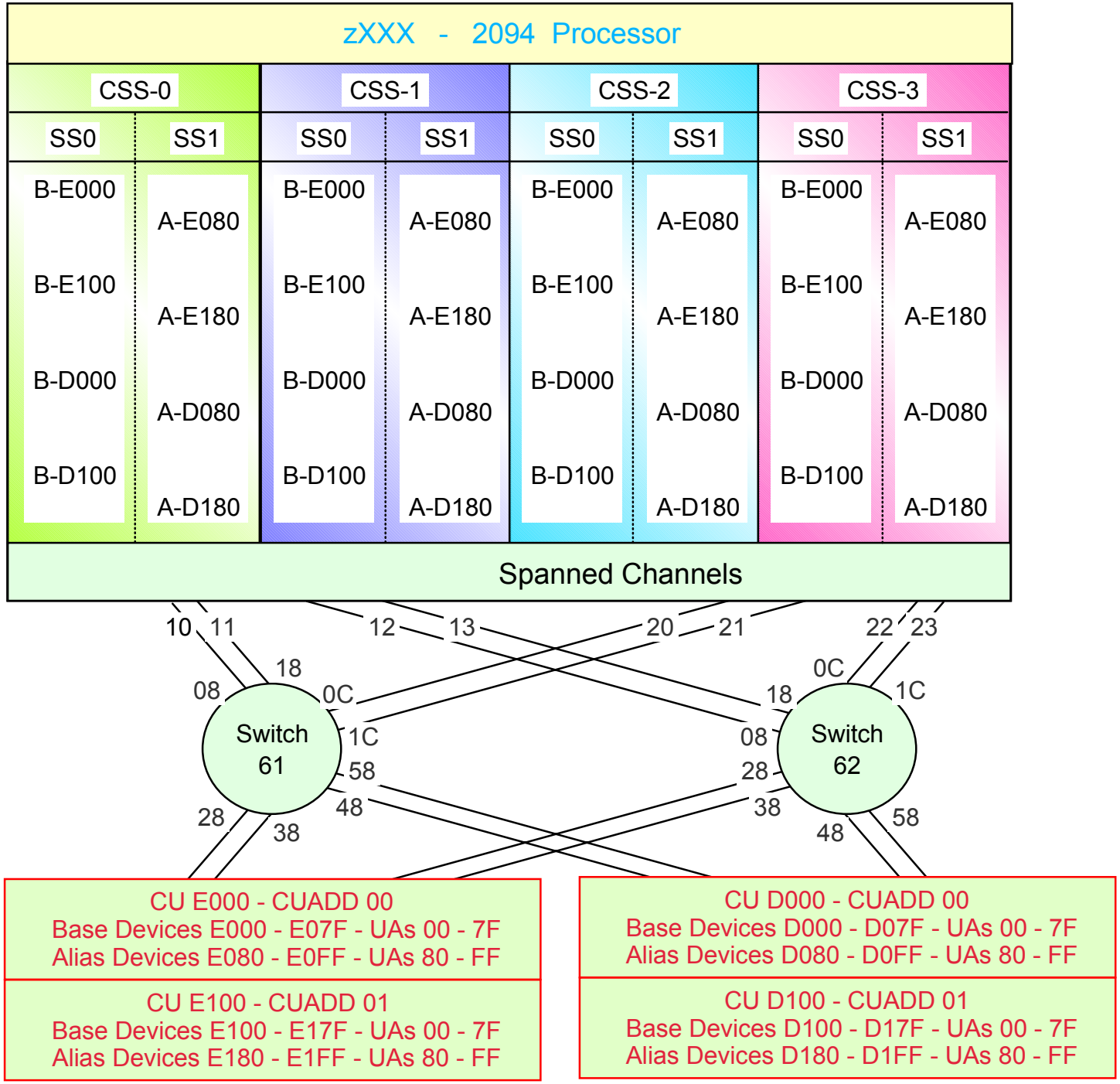
- The benefit of moving the alias device numbers out of SS0 into CSS1, is to 'free up' device number subchannels out of SS0 that those device number subchannels can then be used to support the installation of additional DASD base device hardware
  - z/OS Base devices require base device number subchannels out of SS0
  - z/OS 1.7 Alias device number subchannels can reside in SS0 or SS1, or some may reside in SS0 and others may reside in SS1

- Note: For this examples each DASD LSS (CUADD) has a range of 128 base devices (x'80') starting at UA x'00' for the first base in the LSS, and each LSS has a range of 128 alias devices (x'80') starting UA x'80' for the first alias in the LSS

z9 109 - 2094 - Base and Alias
UCB (0) to UCW Subchannel Set 0 Mapping
UCB (1) to UCW Subchannel Set 1 Mapping

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

- Subchannel Sets - Base and Alias Problem determination - z/OS and System Status
  - D IPLINFO - z/OS version and release
  - D M=CPU - processor type - CPC name - LPAR name - MIF - Logical partition ID
  - D IOS,CONFIG - active IODF - active OSCONFIG - h/w / s/w in-sync status
  - D IOS,CONFIG(ALL) - number of available subchannels for dynamic
- Subchannel Sets - Base and Alias Problem determination - Device Status - z/OS
  - D U,,,dddd,nn
  - D U,VOL=vvvvvv
  - D M=DEV(dddd)
  - D M=CHP(cc)
  - D M=DEV - shows 5 digit numbering
  - D M=CHP - shows 5 digit numbering
  - D M=DEV(CONFIG(xx)
  - D M=CU (not currently implemented)
- Subchannel Sets - Base and Alias Problem determination - Device Status - DFP
  - DS P,dddd,nn
  - DS QDASD,0dddd,nn
  - DS QDASD,1dddd,nn
  - DS QPAV,0dddd,nn
  - DS QPAV,1dddd,nn
  - DS QPAV,0dddd,VOLUME - shows 5 digit numbering
  - DS QPAV,nnnn,VOLUME - shows 5 digit numbering
  - DS QPAV,SSID=ssss
- Subchannel Sets - Base and Alias Problem determination - HCD - Definition Status
  - HCD memu option 6.4 - IODF type and version
  - 1.3.s - channel subsystems and subchannel sets - number of subchannels specified and used
  - 1.4 - CUdefinition
  - 1.4.v I/O device to processor / CU - hardware device subchannel definition location
  - 1..4.s.v.s I/O device to OSCONFIG - software UCB subchannel definition location


zXXX - 2094 Processor
CSS-0
CSS-1
CSS-2
CSS-3
SS0
SS1
B-E000
A-E080
B-E100
A-E180
B-D000
A-D080
B-D100
A-D180
Spanned Channels
10
11
12
13
20
21
22
23
08
18
0C
1C
58
48
28
38
Switch 61
Switch 62
CU E000 - CUADD 00
Base Devices E000 - E07F - UAs 00 - 7F
Alias Devices E080 - E0FF - UAs 80 - FF
CU E100 - CUADD 01
Base Devices E100 - E17F - UAs 00 - 7F
Alias Devices E180 - E1FF - UAs 80 - FF
CU D000 - CUADD 00
Base Devices D000 - D07F - UAs 00 - 7F
Alias Devices D080 - D0FF - UAs 80 - FF
CU D100 - CUADD 01
Base Devices D100 - D17F - UAs 00 - 7F
Alias Devices D180 - D1FF - UAs 80 - FF

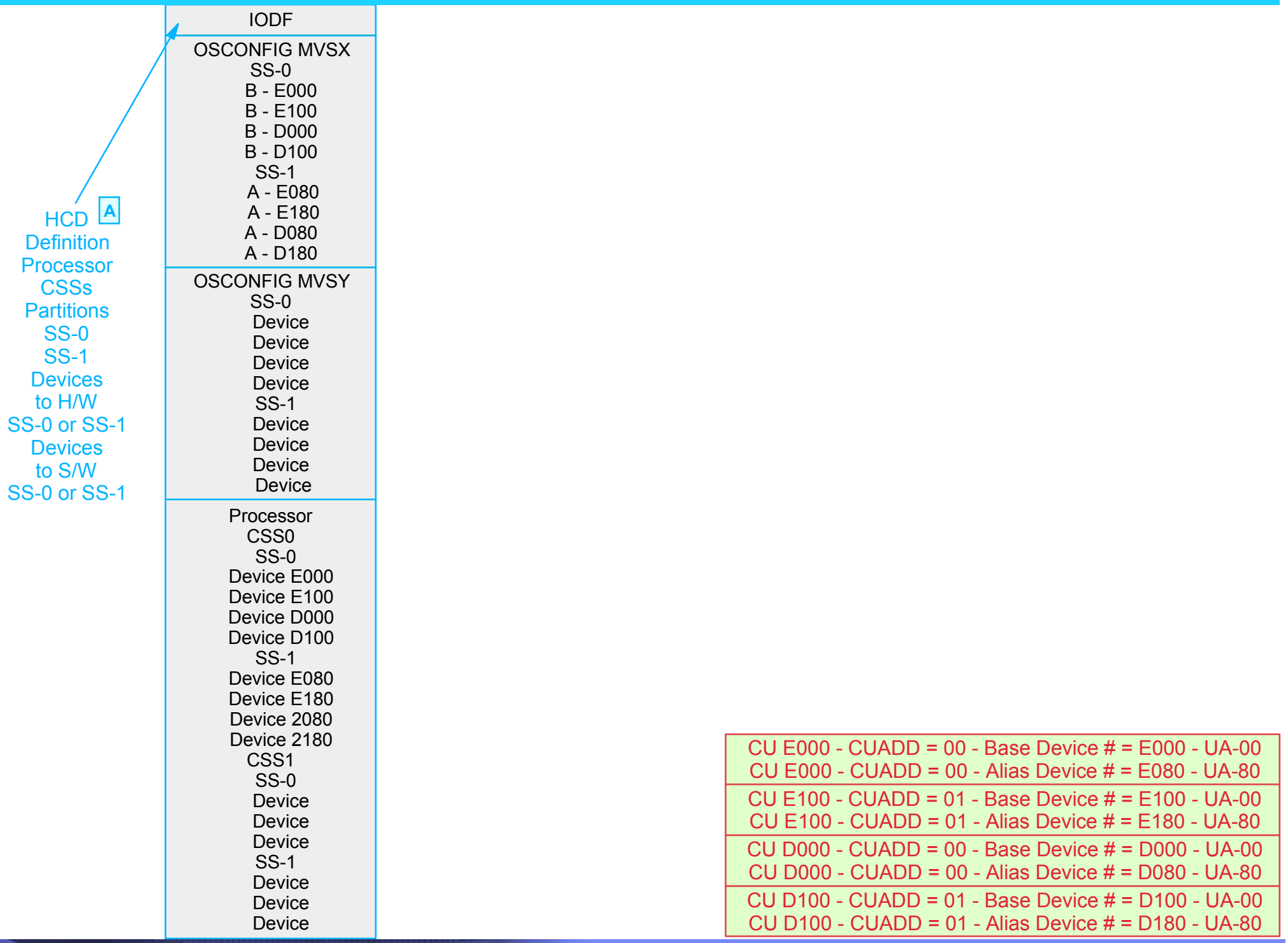
CU E000 - CUADD = 00 - Base Device # = E000 - UA-00
CU E000 - CUADD = 00 - Alias Device # = E080 - UA-80

CU E100 - CUADD = 01 - Base Device # = E100 - UA-00
CU E100 - CUADD = 01 - Alias Device # = E180 - UA-80

CU D000 - CUADD = 00 - Base Device # = D000 - UA-00
CU D000 - CUADD = 00 - Alias Device # = D080 - UA-80

CU D100 - CUADD = 01 - Base Device # = D100 - UA-00
CU D100 - CUADD = 01 - Alias Device # = D180 - UA-80

- System definition and In intialization
  a. Using HCD - define the I/O configuration and build a production IODF
  b. After the 2094 is installed, write the IOCDS
  c. Customize the Reset profile, and Reset profile activate the 2094
  d. Customize the LOADxx member
  e. Specify the Load Device number and the Loadparms (nnnnXXMN)
     - Load device = z/OS SYSRES volume - device number
     - where Loadparm 'nnnn' = IODF volume - device number
  f. IPL (Initial Program Load) using Load Profile or Manual Load operation
  g. Find the IODF dataset name as per the LOADxx specification
  h. Find the OSCONFIG as per the LOADxx specification
  i. Get the OSCONFIG and build the UCBs (non-mapped - not initialized)
     - UCBs will be built for devices defined to reside in SS-0
     - UCBs will be built for devices defined to reside in SS-1
     - The NCON (Not-connected) bit set to = 1 = UCB device not mapped (to a UCW device)
     - No SID value (Subchannel ID)
     - UCB subcahannel enable bit not set
- Then map UCB SS-0 and SS-1 devices to Subchannels (devices)

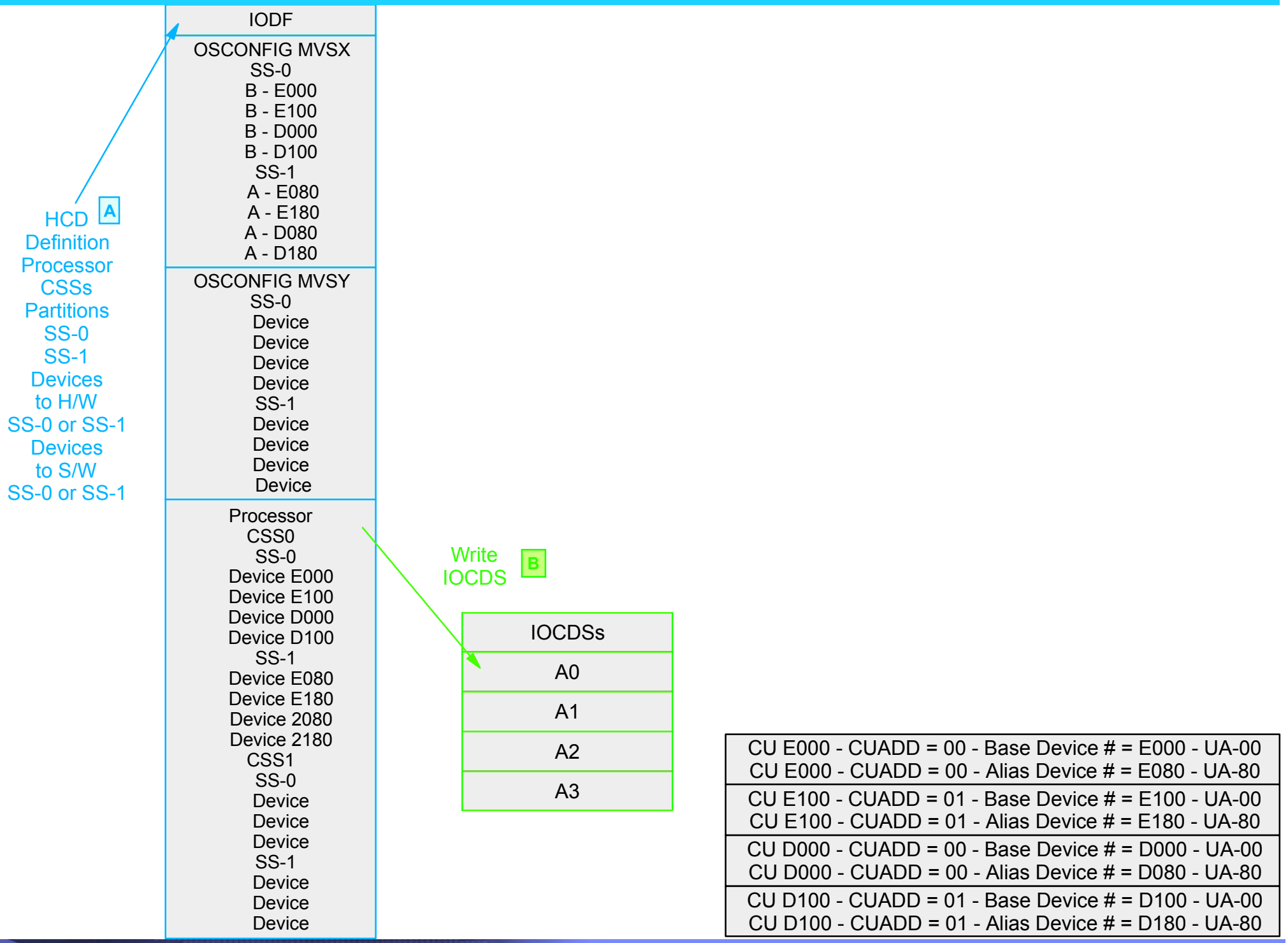


CU E000 - CUADD = 00 - Base Device # = E000 - UA-00
CU E000 - CUADD = 00 - Alias Device # = E080 - UA-80

CU E100 - CUADD = 01 - Base Device # = E100 - UA-00
CU E100 - CUADD = 01 - Alias Device # = E180 - UA-80

CU D000 - CUADD = 00 - Base Device # = D000 - UA-00
CU D000 - CUADD = 00 - Alias Device # = D080 - UA-80

CU D100 - CUADD = 01 - Base Device # = D100 - UA-00
CU D100 - CUADD = 01 - Alias Device # = D180 - UA-80


IODF
OSCONFIG MVSX
SS-0
B - E000
B - E100
B - D000
B - D100
SS-1
A - E080
A - E180
A - D080
A - D180
OSCONFIG MVSY
SS-0
Device
Device
Device
Device
SS-1
Device
Device
Device
Device
Processor
CSS0
SS-0
Device E000
Device E100
Device D000
Device D100
SS-1
Device E080
Device E180
Device 2080
Device 2180
CSS1
SS-0
Device
Device
Device
SS-1
Device
Device
Device
HCD
A
Definition
Processor
CSSs
Partitions
SS-0
SS-1
Devices
to H/W
SS-0 or SS-1
Devices
to S/W
SS-0 or SS-1
Write
IOCDS
B
IOCDSs
A0
A1
A2
A3
CU E000 - CUADD = 00 - Base Device # = E000 - UA-00
CU E000 - CUADD = 00 - Alias Device # = E080 - UA-80
CU E100 - CUADD = 01 - Base Device # = E100 - UA-00
CU E100 - CUADD = 01 - Alias Device # = E180 - UA-80
CU D000 - CUADD = 00 - Base Device # = D000 - UA-00
CU D000 - CUADD = 00 - Alias Device # = D080 - UA-80
CU D100 - CUADD = 01 - Base Device # = D100 - UA-00
CU D100 - CUADD = 01 - Alias Device # = D180 - UA-80

HCD A
Definition
Processor
CSSs
Partitions
SS-0
SS-1
Devices
to H/W
SS-0 or SS-1
Devices
to S/W
SS-0 or SS-1

IODF

OSCONFIG MVSX
SS-0
B - E000
B - E100
B - D000
B - D100
SS-1
A - E080
A - E180
A - D080
A - D180

OSCONFIG MVSY
SS-0
Device
Device
Device
Device
SS-1
Device
Device
Device
Device

Processor
CSS0
SS-0
Device E000
Device E100
Device D000
Device D100
SS-1
Device E080
Device E180
Device 2080
Device 2180
CSS1
SS-0
Device
Device
Device
SS-1
Device
Device
Device

Write IOCDS B

C Reset Profile Activation

IOCDSs
A0
A1
A2
A3

2094 Logical Partition

HSA

CSS-0 Subchannels

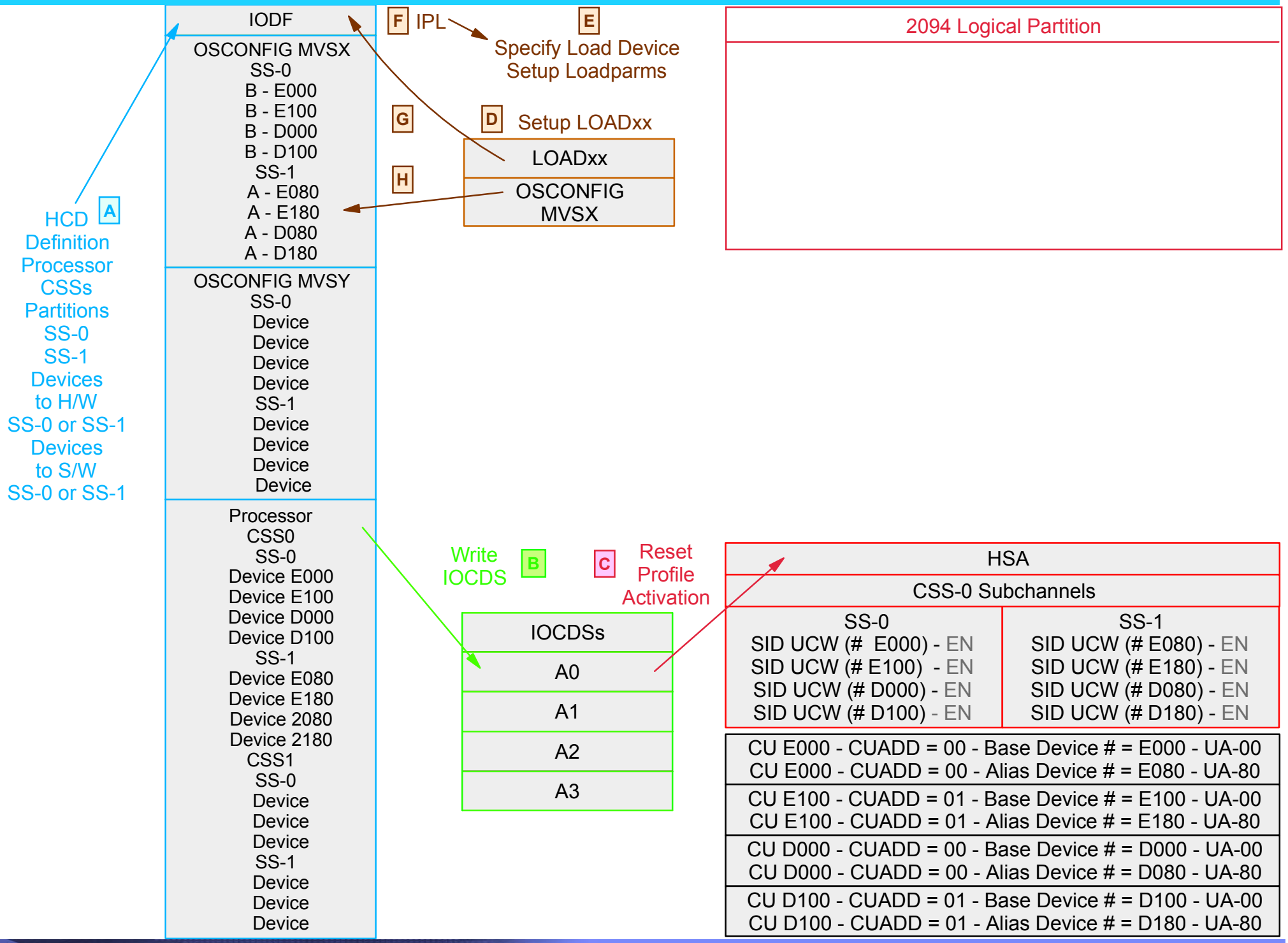
SS-0	SS-1
SID UCW (# E000) - EN	SID UCW (# E080) - EN
SID UCW (# E100) - EN	SID UCW (# E180) - EN
SID UCW (# D000) - EN	SID UCW (# D080) - EN
SID UCW (# D100) - EN	SID UCW (# D180) - EN

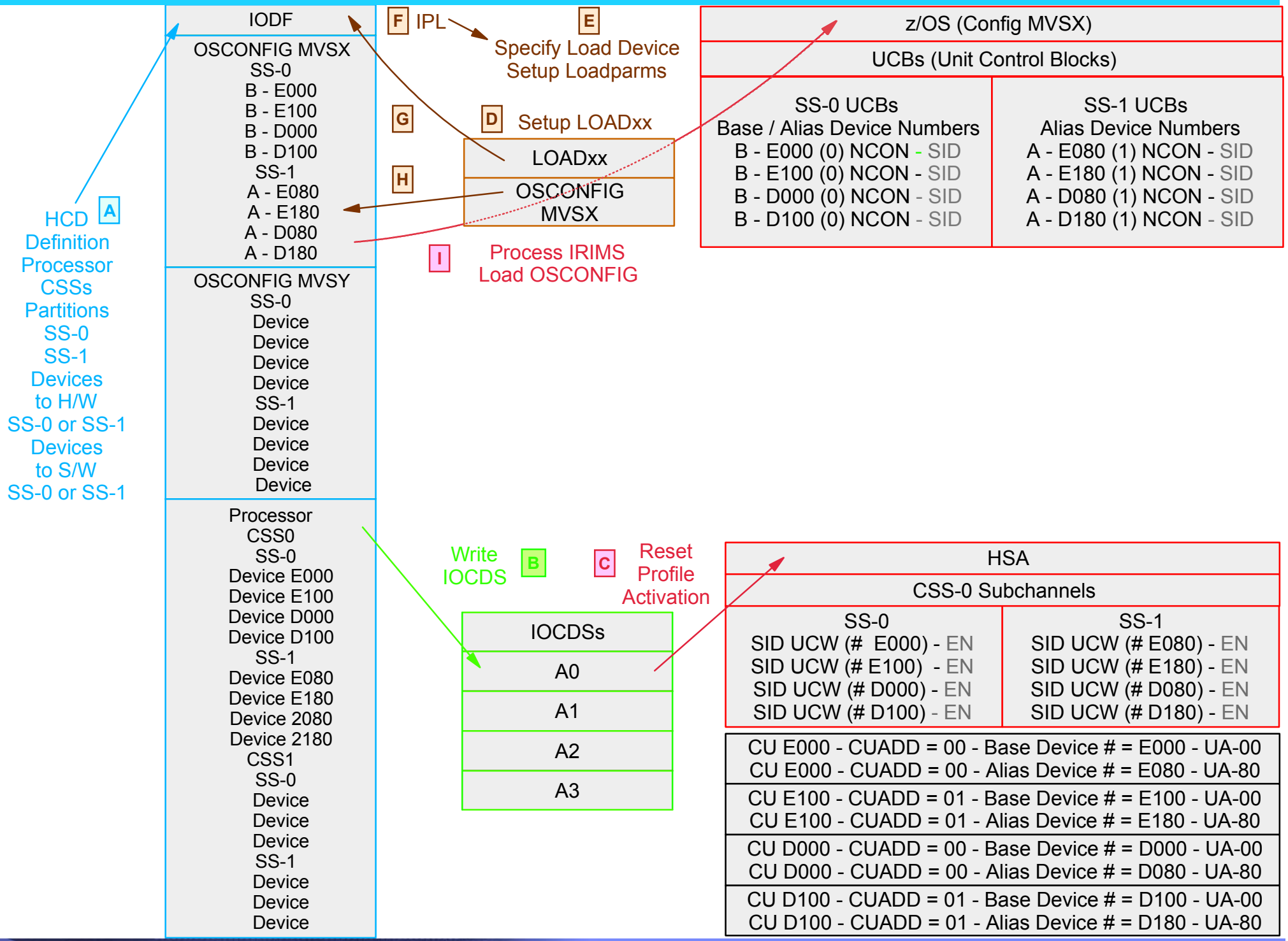
CU E000 - CUADD = 00 - Base Device # = E000 - UA-00
CU E000 - CUADD = 00 - Alias Device # = E080 - UA-80

CU E100 - CUADD = 01 - Base Device # = E100 - UA-00
CU E100 - CUADD = 01 - Alias Device # = E180 - UA-80

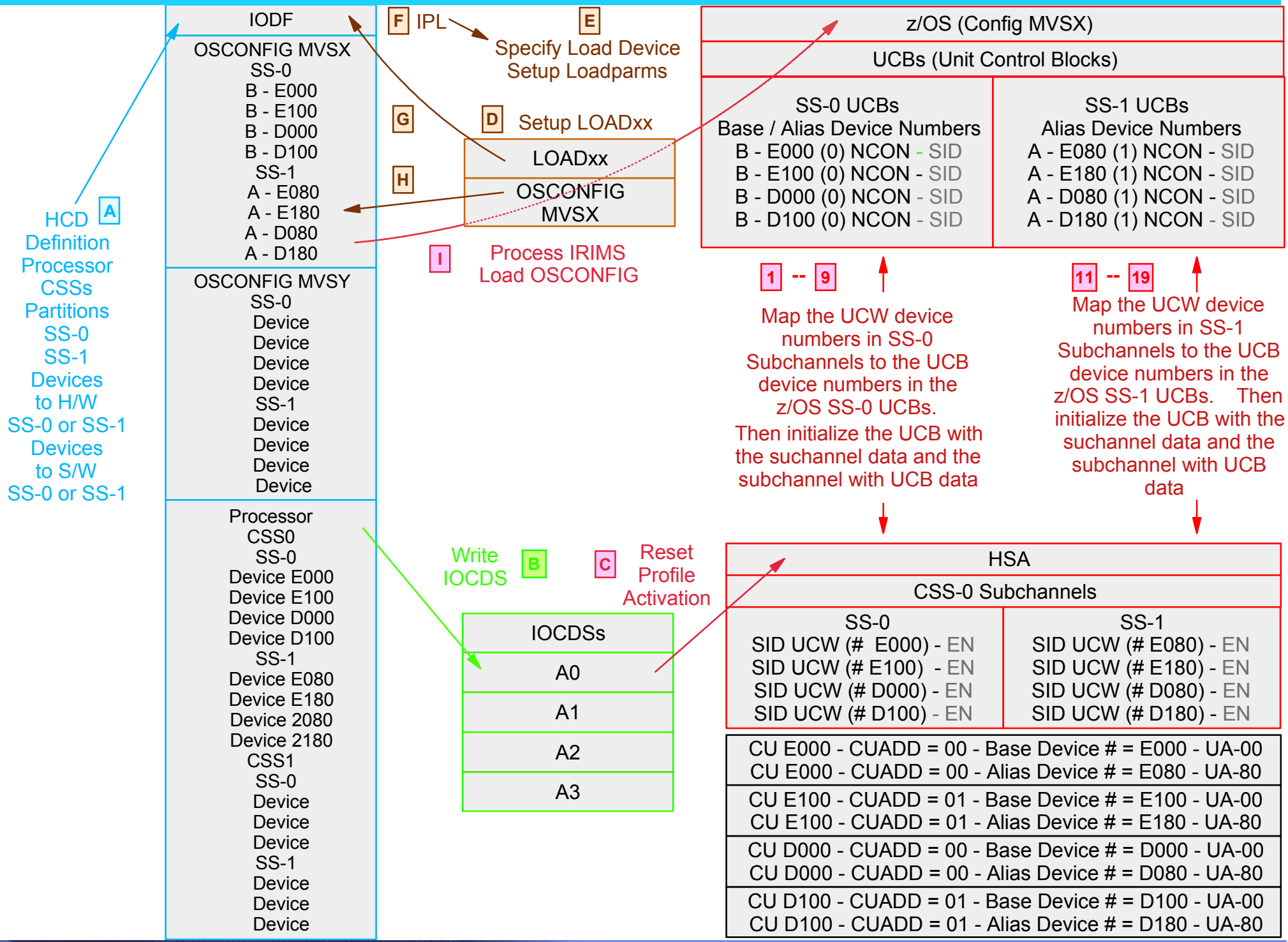
CU D000 - CUADD = 00 - Base Device # = D000 - UA-00
CU D000 - CUADD = 00 - Alias Device # = D080 - UA-80

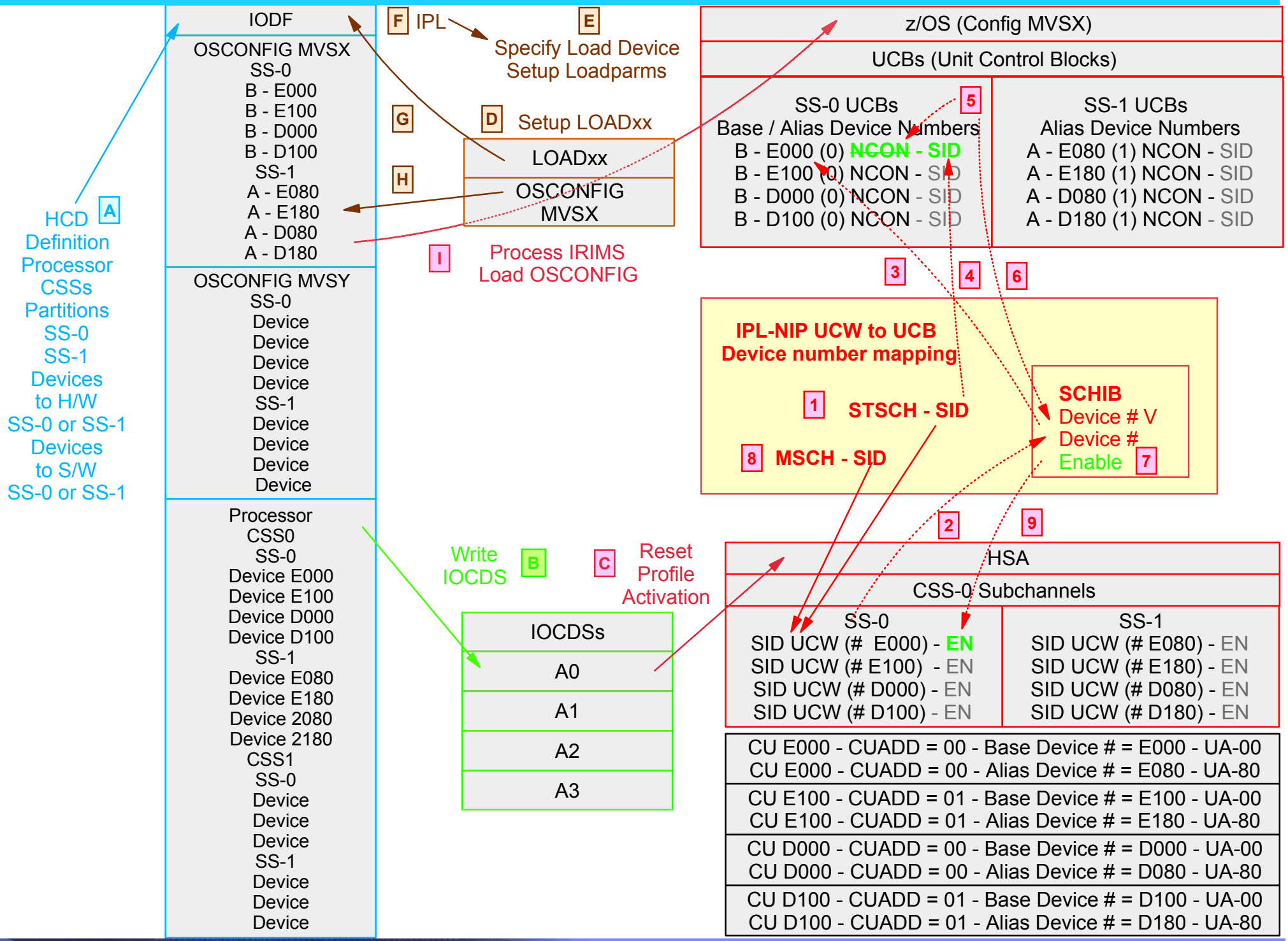
CU D100 - CUADD = 01 - Base Device # = D100 - UA-00
CU D100 - CUADD = 01 - Alias Device # = D180 - UA-80


IODF
OSCONFIG MVSX
SS-0
B - E000
B - E100
B - D000
B - D100
SS-1
A - E080
A - E180
A - D080
A - D180
OSCONFIG MVSY
SS-0
Device
Device
Device
Device
SS-1
Device
Device
Device
Device
Processor
CSS0
SS-0
Device E000
Device E100
Device D000
Device D100
SS-1
Device E080
Device E180
Device 2080
Device 2180
CSS1
SS-0
Device
Device
Device
SS-1
Device
Device
Device
HCD
A
Definition
Processor
CSSs
Partitions
SS-0
SS-1
Devices
to H/W
SS-0 or SS-1
Devices
to S/W
SS-0 or SS-1
F
IPL
E
Specify Load Device
Setup Loadparms
G
D
Setup LOADxx
LOADxx
H
OSCONFIG
MVSX
2094 Logical Partition
Write
IOCDS
B
C
Reset
Profile
Activation
IOCDSs
A0
A1
A2
A3
HSA
CSS-0 Subchannels
SS-0
SID UCW (# E000) - EN
SID UCW (# E100) - EN
SID UCW (# D000) - EN
SID UCW (# D100) - EN
SS-1
SID UCW (# E080) - EN
SID UCW (# E180) - EN
SID UCW (# D080) - EN
SID UCW (# D180) - EN
CU E000 - CUADD = 00 - Base Device # = E000 - UA-00
CU E000 - CUADD = 00 - Alias Device # = E080 - UA-80
CU E100 - CUADD = 01 - Base Device # = E100 - UA-00
CU E100 - CUADD = 01 - Alias Device # = E180 - UA-80
CU D000 - CUADD = 00 - Base Device # = D000 - UA-00
CU D000 - CUADD = 00 - Alias Device # = D080 - UA-80
CU D100 - CUADD = 01 - Base Device # = D100 - UA-00
CU D100 - CUADD = 01 - Alias Device # = D180 - UA-80

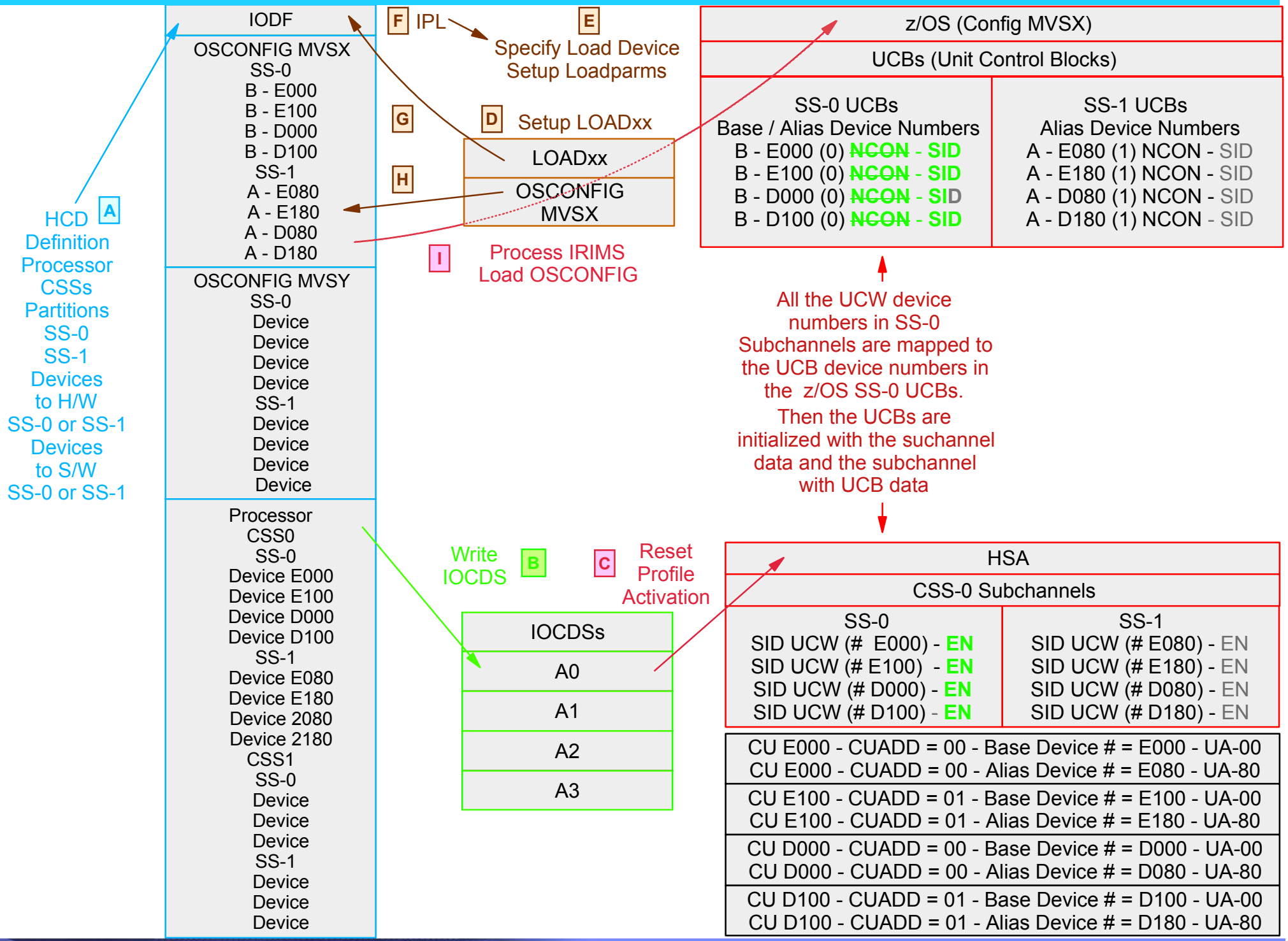

HCD
A
Definition
Processor
CSSs
Partitions
SS-0
SS-1
Devices
to H/W
SS-0 or SS-1
Devices
to S/W
SS-0 or SS-1
IODF
OSCONFIG MVSX
SS-0
B - E000
B - E100
B - D000
B - D100
SS-1
A - E080
A - E180
A - D080
A - D180
OSCONFIG MVSY
SS-0
Device
Device
Device
Device
SS-1
Device
Device
Device
Device
Processor
CSS0
SS-0
Device E000
Device E100
Device D000
Device D100
SS-1
Device E080
Device E180
Device 2080
Device 2180
CSS1
SS-0
Device
Device
Device
SS-1
Device
Device
Device
F
IPL
E
Specify Load Device
Setup Loadparms
G
D
Setup LOADxx
LOADxx
H
OSCONFIG
MVSX
I
Process IRIMS
Load OSCONFIG
z/OS (Config MVSX)
UCBs (Unit Control Blocks)
SS-0 UCBs
Base / Alias Device Numbers
B - E000 (0) NCON - SID
B - E100 (0) NCON - SID
B - D000 (0) NCON - SID
B - D100 (0) NCON - SID
SS-1 UCBs
Alias Device Numbers
A - E080 (1) NCON - SID
A - E180 (1) NCON - SID
A - D080 (1) NCON - SID
A - D180 (1) NCON - SID
Write
IOCDS
B
C
Reset
Profile
Activation
IOCDSs
A0
A1
A2
A3
HSA
CSS-0 Subchannels
SS-0
SID UCW (# E000) - EN
SID UCW (# E100) - EN
SID UCW (# D000) - EN
SID UCW (# D100) - EN
SS-1
SID UCW (# E080) - EN
SID UCW (# E180) - EN
SID UCW (# D080) - EN
SID UCW (# D180) - EN
CU E000 - CUADD = 00 - Base Device # = E000 - UA-00
CU E000 - CUADD = 00 - Alias Device # = E080 - UA-80
CU E100 - CUADD = 01 - Base Device # = E100 - UA-00
CU E100 - CUADD = 01 - Alias Device # = E180 - UA-80
CU D000 - CUADD = 00 - Base Device # = D000 - UA-00
CU D000 - CUADD = 00 - Alias Device # = D080 - UA-80
CU D100 - CUADD = 01 - Base Device # = D100 - UA-00
CU D100 - CUADD = 01 - Alias Device # = D180 - UA-80

- System definition and In intialization
  a. Using HCD - define the I/O configuration and build a production IODF
  b. After the 2094 is installed, write the IOCDS
  c. Customize the Reset profile, and Reset profile activate the 2094
  d. Customize the LOADxx member
  e. Specify the Load Device number and the Loadparms (nnnnXXMN)
     - Load device = z/OS SYSRES volume - device number
     - where Loadparm 'nnnn' = IODF volume - device number
  f. IPL (Initial Program Load) using Load Profile or Manual Load operation
  g. Find the IODF dataset name as per the LOADxx specification
  h. Find the OSCONFIG as per the LOADxx specification
  i. Get the OSCONFIG and build the UCBs (non-mapped - not initialized)
     - UCBs will be built for devices defined to reside in SS-0
     - UCBs will be built for devices defined to reside in SS-1
     - The NCON (Not-connected) bit set to = 1 = UCB device not mapped (to a UCW device)
     - No SID value (Subchannel ID)
     - UCB subcahannel enable bit not set
- Now map UCB SS-0 and SS-1 devices to Subchannels (devices)

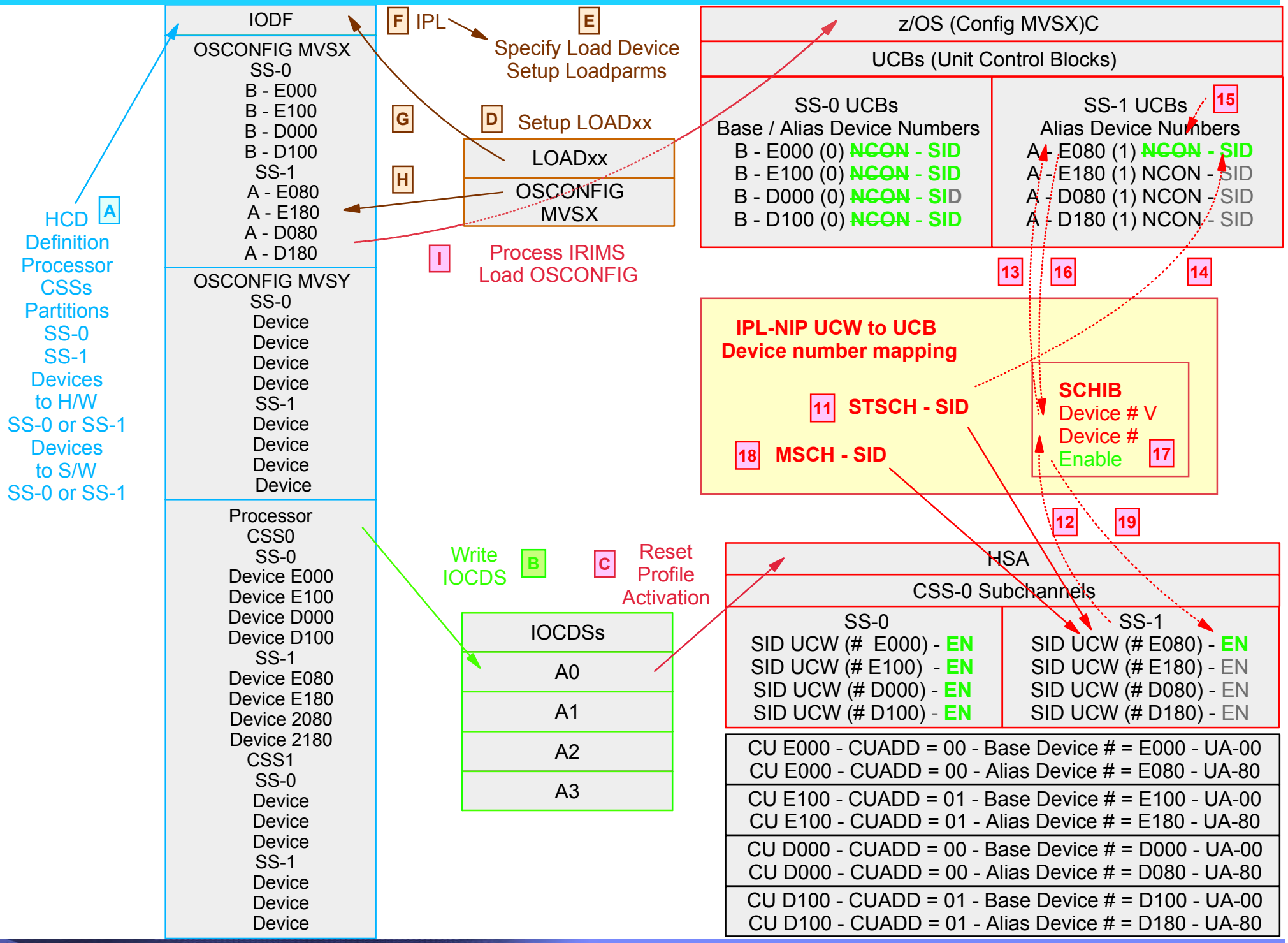

IODF
OSCONFIG MVSX
SS-0
B - E000
B - E100
B - D000
B - D100
SS-1
A - E080
A - E180
A - D080
A - D180
OSCONFIG MVSY
SS-0
Device
Device
Device
Device
SS-1
Device
Device
Device
Device
Processor
CSS0
SS-0
Device E000
Device E100
Device D000
Device D100
SS-1
Device E080
Device E180
Device 2080
Device 2180
CSS1
SS-0
Device
Device
Device
SS-1
Device
Device
Device
A HCD Definition Processor CSSs Partitions SS-0 SS-1 Devices to H/W SS-0 or SS-1 Devices to S/W SS-0 or SS-1
F IPL
E Specify Load Device Setup Loadparms
G
D Setup LOADxx
LOADxx
H
OSCONFIG MVSX
I Process IRIMS Load OSCONFIG
z/OS (Config MVSX)
UCBs (Unit Control Blocks)
SS-0 UCBs
Base / Alias Device Numbers
B - E000 (0) NCON - SID
B - E100 (0) NCON - SID
B - D000 (0) NCON - SID
B - D100 (0) NCON - SID
SS-1 UCBs
Alias Device Numbers
A - E080 (1) NCON - SID
A - E180 (1) NCON - SID
A - D080 (1) NCON - SID
A - D180 (1) NCON - SID
1 -- 9
Map the UCW device numbers in SS-0 Subchannels to the UCB device numbers in the z/OS SS-0 UCBs.
Then initialize the UCB with the suchannel data and the subchannel with UCB data
11 -- 19
Map the UCW device numbers in SS-1 Subchannels to the UCB device numbers in the z/OS SS-1 UCBs. Then initialize the UCB with the suchannel data and the subchannel with UCB data
Write IOCDS
B
C Reset Profile Activation
IOCDSs
A0
A1
A2
A3
HSA
CSS-0 Subchannels
SS-0
SID UCW (# E000) - EN
SID UCW (# E100) - EN
SID UCW (# D000) - EN
SID UCW (# D100) - EN
SS-1
SID UCW (# E080) - EN
SID UCW (# E180) - EN
SID UCW (# D080) - EN
SID UCW (# D180) - EN
CU E000 - CUADD = 00 - Base Device # = E000 - UA-00
CU E000 - CUADD = 00 - Alias Device # = E080 - UA-80
CU E100 - CUADD = 01 - Base Device # = E100 - UA-00
CU E100 - CUADD = 01 - Alias Device # = E180 - UA-80
CU D000 - CUADD = 00 - Base Device # = D000 - UA-00
CU D000 - CUADD = 00 - Alias Device # = D080 - UA-80
CU D100 - CUADD = 01 - Base Device # = D100 - UA-00
CU D100 - CUADD = 01 - Alias Device # = D180 - UA-80


HCD
A
Definition
Processor
CSSs
Partitions
SS-0
SS-1
Devices
to H/W
SS-0 or SS-1
Devices
to S/W
SS-0 or SS-1
IODF
OSCONFIG MVSX
SS-0
B - E000
B - E100
B - D000
B - D100
SS-1
A - E080
A - E180
A - D080
A - D180
OSCONFIG MVSY
SS-0
Device
Device
Device
Device
SS-1
Device
Device
Device
Device
Processor
CSS0
SS-0
Device E000
Device E100
Device D000
Device D100
SS-1
Device E080
Device E180
Device 2080
Device 2180
CSS1
SS-0
Device
Device
Device
SS-1
Device
Device
Device
F IPL
E
Specify Load Device
Setup Loadparms
G
D
Setup LOADxx
LOADxx
H
OSCONFIG
MVSX
I
Process IRIMS
Load OSCONFIG
z/OS (Config MVSX)
UCBs (Unit Control Blocks)
SS-0 UCBs
Base / Alias Device Numbers
B - E000 (0) NCON - SID
B - E100 (0) NCON - SID
B - D000 (0) NCON - SID
B - D100 (0) NCON - SID
SS-1 UCBs
Alias Device Numbers
A - E080 (1) NCON - SID
A - E180 (1) NCON - SID
A - D080 (1) NCON - SID
A - D180 (1) NCON - SID
5
3
4
6
IPL-NIP UCW to UCB
Device number mapping
1
STSCH - SID
8
MSCH - SID
SCHIB
Device # V
Device #
Enable
7
2
9
Write
IOCDS
B
C
Reset
Profile
Activation
IOCDSs
A0
A1
A2
A3
HSA
CSS-0 Subchannels
SS-0
SID UCW (# E000) - EN
SID UCW (# E100) - EN
SID UCW (# D000) - EN
SID UCW (# D100) - EN
SS-1
SID UCW (# E080) - EN
SID UCW (# E180) - EN
SID UCW (# D080) - EN
SID UCW (# D180) - EN
CU E000 - CUADD = 00 - Base Device # = E000 - UA-00
CU E000 - CUADD = 00 - Alias Device # = E080 - UA-80
CU E100 - CUADD = 01 - Base Device # = E100 - UA-00
CU E100 - CUADD = 01 - Alias Device # = E180 - UA-80
CU D000 - CUADD = 00 - Base Device # = D000 - UA-00
CU D000 - CUADD = 00 - Alias Device # = D080 - UA-80
CU D100 - CUADD = 01 - Base Device # = D100 - UA-00
CU D100 - CUADD = 01 - Alias Device # = D180 - UA-80

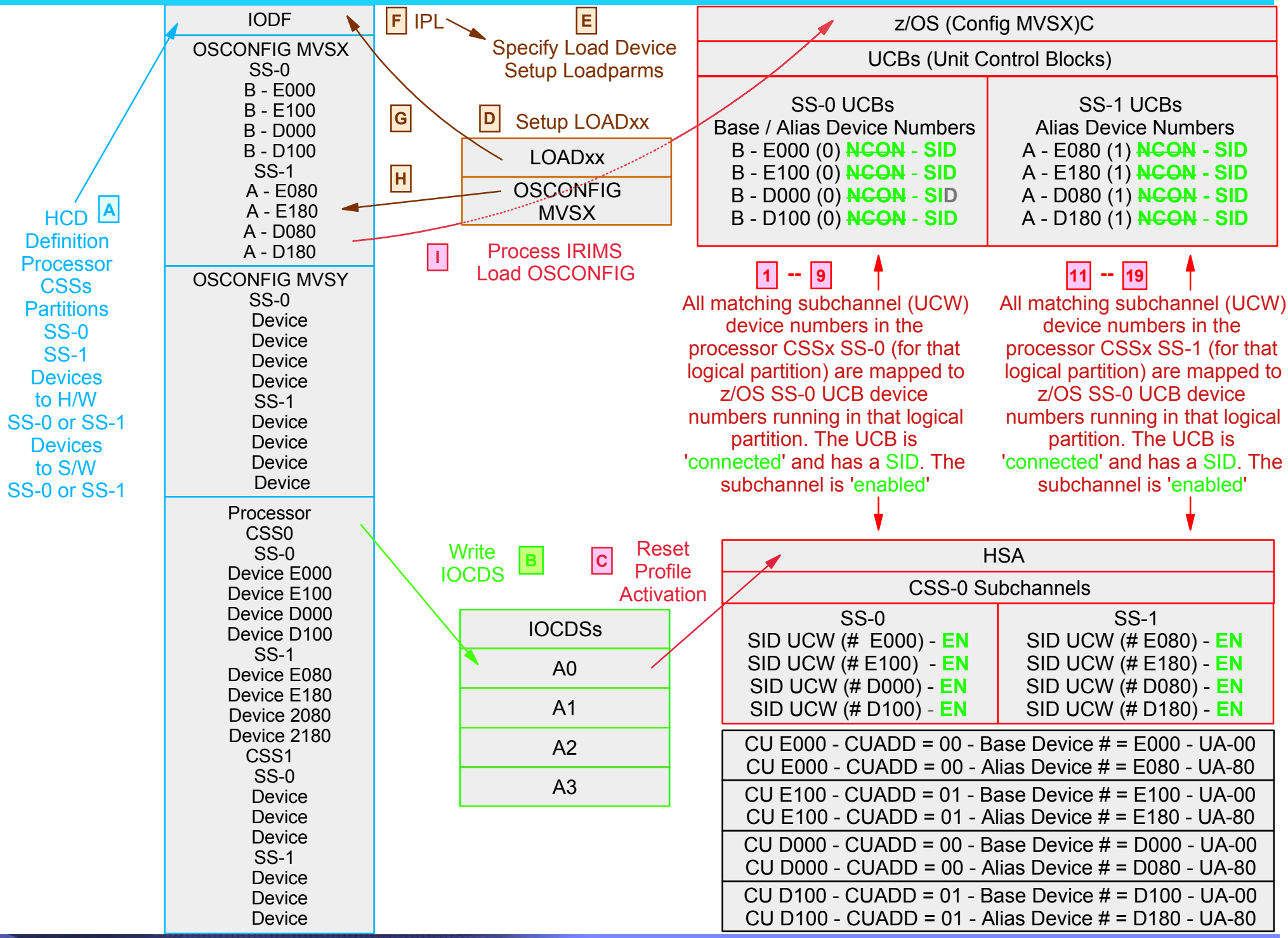
2094 - Subchannel Sets - Base and Alias I/O Problem Determination - Mapping



2094 - Subchannel Sets - Base and Alias I/O Problem Determination - Mapping



2094 - Subchannel Sets - Base and Alias I/O Problem Determination - Mapping



z9 109 - 2094 - Base and Alias z/OS and DFP - Command Usage Problem Determination

Kenneth (Ken) Trowell
zSeries Channel Development
IBM Poughkeepsie
September 28 2005

- Subchannel Sets - Base and Alias Problem determination - z/OS and System Status
  - D IPLINFO - z/OS version and release
  - D M=CPU - processor type - CPC name - LPAR name - MIF - Logical partition ID
  - D IOS,CONFIG - active IODF - active OSCONFIG - h/w / s/w in-sync status
  - D IOS,CONFIG(ALL) - number of available subchannels for dynamic
- Subchannel Sets - Base and Alias Problem determination - Device Status - z/OS
  - D U,,,dddd,nn
  - D U,VOL=vvvvvv
  - D M=DEV(dddd)
  - D M=CHP(cc)
  - D M=DEV - shows 5 digit numbering
  - D M=CHP - shows 5 digit numbering
  - D M=DEV(CONFIG(xx)
  - D M=CU (not currently implemented)
- Subchannel Sets - Base and Alias Problem determination - Device Status - DFP
  - DS P,dddd,nn
  - DS QDASD,0dddd,nn
  - DS QDASD,1dddd,nn
  - DS QPAV,0dddd,nn
  - DS QPAV,1dddd,nn
  - DS QPAV,0dddd,VOLUME - shows 5 digit numbering
  - DS QPAV,nnnn,VOLUME - shows 5 digit numbering
  - DS PAV,SSID=ssss (use DS P,dddd to determine the SSID number
- Subchannel Sets - Base and Alias Problem determination - HCD - Definition Status
  - HCD memu option 6.4 - IODF type and version
  - 1.3.s - channel subsystems and subchannel sets - number of subchannels specified and used
  - 1.4 - CUdefinition
  - 1.4.v I/O device to processor / CU - hardware device subchannel definition location
  - 1..4.s.v.s I/O device to OSCONFIG - software UCB subchannel definition location

z/OS Command - D IPLINFO - what is the z/OS level, and when was it IPL'd

```
D IPLINFO
IEE254I  13.54.08 IPLINFO DISPLAY 512
 SYSTEM IPLED AT 13.39.20 ON 04/26/2005
 RELEASE z/OS 01.07.00     LICENSE = z/OS
 USED LOAD14 IN SYS4.IPLPARM ON 4843
 ARCHLVL = 2    MTLSHARE = N
 IEASYM LIST = (00,CH,E2,L)
 IEASYS LIST = 10 (OP)
 IODF DEVICE 4843
 IPL DEVICE 4A3C VOLUME ZOS7S9
```

- z/OS version 1 release 7 (z/OS 1.7)
- LOADxx used and the IPLPARM dataset found
- IODF device
- IPL device (SYSRES)

z/OS Command - D M=CPU - how many CPUs and zAAPs, their status and serial numbers

```
DD M=CPU
IEE174I 13.54.46 DISPLAY M 520
PROCESSOR STATUS
ID  CPU                SERIAL
00  +                   010CBE2094
01  +                   010CBE2094
02  +                   010CBE2094
03  +                   010CBE2094
04  +                   010CBE2094
05  +                   010CBE2094
06  +                   010CBE2094
07  +                   010CBE2094
08  +                   010CBE2094
09  +                   010CBE2094
0A  +                   010CBE2094
0B  +                   010CBE2094
0C  +                   010CBE2094
0D  +                   010CBE2094
0E  +                   010CBE2094
0F  +                   010CBE2094
10  +                   010CBE2094
11  +                   010CBE2094
```

- State of the logical processors defined to ths logical partition
- CPU serial numbers, the first two digits of the CPU serial number eare equal to the Logical Partition ID (as secified in the image profile for this logical parition

z/OS Command - D M=CPU .... cont

- allows the customer you to know where z/OS is running
- important for any I/O related problem determination

```
DD M=CPU
IEE174I 13.54.46 DISPLAY M 520
....
....
PROCESSOR STATUS
CPC ND = 002094.S18.IBM.02.0000000B0CBE
CPC SI = 2094.S18.IBM.02.000000000000B0CBE
CPC ID = 00
CPC NAME = T47
LP NAME = TC4T01      LP ID =  1
CSS ID  = 0
MIF ID  = 1

+ ONLINE     - OFFLINE     . DOES NOT EXIST     W WLM-MANAGED
N NOT AVAILABLE

CPC ND  CENTRAL PROCESSING COMPLEX NODE DESCRIPTOR
CPC SI  SYSTEM INFORMATION FROM STSI INSTRUCTION
CPC ID  CENTRAL PROCESSING COMPLEX IDENTIFIER
CPC NAME CENTRAL PROCESSING COMPLEX NAME
LP NAME  LOGICAL PARTITION NAME
LP ID    LOGICAL PARTITION IDENTIFIER
CSS ID   CHANNEL SUBSYSTEM IDENTIFIER
MIF ID   MULTIPLE IMAGE FACILITY IMAGE IDENTIFIER
```

- CPC Node Descriptor
- CPC name, as defined for this CPC object
- Logical Partition name - as defined in the I/O configuration definition (HCD or IOCP)
- CSS ID
- MIF ID

z/OS Command - D IOS,CONFIG

allow the customer to determine what IODF and OSCONFIG are in-use by z/OS running in this image (see D M=CPU)

```
D IOS,CONFIG
IOS506I 13.57.11 I/O CONFIG DATA 545
ACTIVE IODF DATA SET = IODF.IODF14
CONFIGURATION ID = TC4SYST        EDT ID = 00
TOKEN:  PROCESSOR DATE     TIME     DESCRIPTION
 SOURCE: TC4SYST  05-04-26 10:01:49 IODF     IODF14
ACTIVE CSS:  0    SUBCHANNEL SETS IN USE: 0, 1
```

Active IODF (see also the IPL flow foils)
OSCONFIG ID (see also the IPL flow foils)
Processor Token IODF (allows S/W - H/W in-sync check by user)
z/OS 1.7 also shows what subchannel sets are available

z/OS Command - D IOS,CONFIG .... cont

Allows the customer to see how many LCU and subchannel control blocks are available for Dynamic I/O Reconfiguration
Controlled by HCD MAXDEV and number of devices defined

```
D IOS,CONFIG(ALL)
IOS506I 13.57.34 I/O CONFIG DATA 547
ACTIVE IODF DATA SET = IODF.IODF14
CONFIGURATION ID = TC4SYST        EDT ID = 00
TOKEN:  PROCESSOR DATE     TIME     DESCRIPTION
 SOURCE: TC4SYST  05-04-26 10:01:49 IODF     IODF14
ACTIVE CSS:  0    SUBCHANNEL SETS IN USE: 0, 1
HARDWARE SYSTEM AREA AVAILABLE FOR CONFIGURATION CHANGES
PHYSICAL CONTROL UNITS                7669
CSS  0 - LOGICAL CONTROL UNITS        3722
 SS  0   SUBCHANNELS                 42400
 SS  1   SUBCHANNELS                 47807
CSS  1 - LOGICAL CONTROL UNITS        3746
 SS  0   SUBCHANNELS                 42463
 SS  1   SUBCHANNELS                 47999
CSS  2 - LOGICAL CONTROL UNITS        3729
 SS  0   SUBCHANNELS                 41825
 SS  1   SUBCHANNELS                 46271
CSS  3 - LOGICAL CONTROL UNITS        3744
 SS  0   SUBCHANNELS                 42043
 SS  1   SUBCHANNELS                 46271
ELIGIBLE DEVICE TABLE LATCH COUNTS
        0 OUTSTANDING BINDS ON PRIMARY EDT
```

CSS-0
Additonal LCUs available in CSS-0
Additional Subchannels available in SS0
Additional Subchannels available in SS1
CSS-1
Additonal LCUs available in CSS-1
Additional Subchannels available in SS0
Additional Subchannels available in SS1
CSS-2
Additonal LCUs available in CSS-2
Additional Subchannels available in SS0
Additional Subchannels available in SS1
CSS-3
Additonal LCUs available in CSS-3
Additional Subchannels available in SS0
Additional Subchannels available in SS1

z/OS Command - D U,,,,dddd,nn

Normal z/OS display unit command, but CANNOT display devices defined in SS-1 (UCBs) or any Alias devices

```
D U,,,E000,4
IEE457I 13.58.33 UNIT STATUS 553
UNIT TYPE STATUS         VOLSER     VOLSTATE
E000 3390 O              SHE000     STRG/RSDNT
E001 3390 O              SHE001     STRG/RSDNT
E002 3390 O              SHE002     STRG/RSDNT
E003 3390 O              SHE003     STRG/RSDNT


D U,,,E080,4
IEE457I 13.59.27 UNIT STATUS 561
UNIT TYPE STATUS         VOLSER     VOLSTATE
E100 3390 O              SHE100     STRG/RSDNT
E101 3390 O              SHE101     STRG/RSDNT
E102 3390 O              SHE102     STRG/RSDNT
E103 3390 O              SHE103     STRG/RSDNT


D U,,,1E080,4
IEE453I UNIT STATUS INVALID OPERAND RE-ENTER
```

Normal z/OS device status display of a device defined in the active OSCONFIG (and not an Alias)

Result of trying to display the z/OS device status of a device that is either not defined in the active OSCONFIG or is a non-z/OS displayable device i.e. an Alias device.

Results in the next 'normal' z/OS device status being displayed

Request was for 'E080' device 'E100" was displayed

For /OS 1.7 Alias devices can be placed in SS-1 and are assigned psudeo 5 digit device numbers. However z/OS display commands do not support 5 digit display requests and if used results in a 'invalid operand' request message