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IBM i Backup and Recovery Licensing

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#powersystems, #powerlinux, #bigdata, #IBMWatson, #OpenPOWER

V1.1

2015 IBM i Licensing Tech Talk Series

Dates (2015)	Title	Replays
September 27	IBM i Licensing Overview: Navigating the World of IBM i Software	IBMers: http://lt.be.ibm.com/stg/ltu51146 Business Partners: http://www.ibm.com/services/weblectures/dlv/partnerworld/ltu51146
October 27	IBM i Licensing Scenarios in Service Provider Environments	IBMers: http://w3.ibm.com/sales/support/ShowDoc.wss?docid=SGDM455228V36367Z41&node=brands,B5000|brands,B5Y00|clientset,IA IBM Business Partners: http://www.ibm.com/partnerworld/wps/servlet/ContentHandler/SGDM455228V36367Z41
November 3	Rational Licensing on IBM i	IBMers: http://w3.ibm.com/sales/support/ShowDoc.wss?docid=SGDR756775P42151P25&node=brands,B5000|brands,B5Y00|clientset,IA IBM Business Partners: http://www.ibm.com/partnerworld/wps/servlet/ContentHandler/SGDR756775P42151P25
November 10	IBM i Entitlement Transfer	IBMers: http://w3.ibm.com/sales/support/ShowDoc.wss?docid=SGDN150776F61876M72&node=brands,B5000|brands,B5Y00|clientset,IA IBM Business Partners: http://www.ibm.com/partnerworld/wps/servlet/ContentHandler/SGDN150776F61876M72
November 17	Backup and Recovery Licensing for IBM i	IBMers: http://w3.ibm.com/sales/support/ShowDoc.wss?docid=SGDR754331I26926L20&node=brands,B5000|brands,B5Y00|clientset,IA IBM Business Partners: http://www.ibm.com/partnerworld/wps/servlet/ContentHandler/SGDR754331I26926L20

Agenda

- IBM i Licensing Basics
- Backup Environments
  - Capacity Backup (CBU)
  - CBU for PowerHA – **New!**
  - Designated Backup Machines (DBM)
  - Summary Comparison of CBU and DBM
- Temporary Key Request Process for CBU and DBM
- Hot/Warm/Cold Backup Solutions
- Using CBU or Designated Backup Machines for Disaster Recovery Tests
- Appendix:
  - Lab Services PowerHA Offerings
  - CBU Frequently Asked Questions

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IBM i Licensing Basics

- IBM i licensing is based on hardware model
  - One IBM i license required per core (plus users on machines where applicable: P05, P10)
    - Also referred to as an "entitlement"

- For IBM i, there are processor groups (also called “software tiers”) which map to machine sizes:
  - Small processor groups P05/P10/P20
  - Medium processor group P30
  - Large processor group P50

NOTE: P05 and P10 are priced per processor plus users

IBM i Licensing Basics

	Model	Price Structure	Processor Group	5250 Enterprise Enablement activation required for interactive workload?
Large	795, 780	Per processor core	P50	yes
Medium	E880, E870, 770, 760	Per processor core	P30	yes
Small	S824 750, 740, 730	Per processor core	P20	yes
	S822 (2 core per partition limit for IBM i) S814 6/8 core 720 & 710 6/8 core Blades: 8/16, 16/32 core PureFlex/Flex: p260: 8/16 core p460: 16/32 core	Per processor core And Per user	P10	per user entitlements instead of 5250 Enterprise Enablement activation
	S814 4 core 720 & 710 4 core Blade: 4 core PureFlex/Flex: p260 7895-23A	Per processor core and user	P05	per user entitlements instead of 5250 Enterprise Enablement activation

IBM i Licensing Basics - Licensed Program Products ("LPPs")

LPPs are separately installed and sometimes separately ordered products which run on IBM i

- Pricing model varies by LPP, e.g.:
  - Per system (may be priced by processor group size)
  - Per user pricing
  - Per processor pricing
  - etc.

  Check individual Ts and Cs (http://www.ibm.com/software/sla/)
- Example of the separately ordered LPPs:

In this presentation and when discussing IBM i backup and recovery licensing, when referring to "LPPs," we are not referring to Passport Advantage products

5648-B45	AFP Font Collection	5761-DS2	Business Graphics Utility
5648-E77	InfoPrint Fonts	5769-FN1	AFP DBCS Fonts
5722-IP1	InfoPrint Server	5769-FNT	AFP Fonts
5733-ARE	Application Runtime Expert	5770-QU1	Query (delivered with DB2 WebQuery only)
5733-B45	AFP Font Collection for i	5798-FAX	Fax
5733-CY2	Cryptographic Device Manager for i	57xx-AF1	Advanced Function Printing Utilities
5733-CY3	Cryptographic Device Manager for i	57xx-BR1	Backup Recovery Media Services
5733-FXD	Integrated Domino Fax	57xx-DE1	DB2 Extenders
5733-ID1	InfoPrint Designer	57xx-DFH	CICS
5733-OAR	Rational Open Access, RPG Edition (now withdrawn effective May 2012)	57xx-HAS	PowerHA for i
		57xx-JS1	Job Scheduler
5733-QU2/QU3/QU4	DB2 Web Query for i (now withdrawn)	57xx-MG1	Managed System Services
5733-WQX/WQE/WQS	DB2 Web Query for i (new as of May 2012)	57xx-PT1	Performance Tools
		57xx-RDW	Rational Developer for i
5733-XT2	XML Toolkit	57xx-SM1	System Manager
5761-AMT	Rational Application Management Toolset	57xx-SOA	Rational Developer for i for SOA Construction
5761-AP1	Advanced DBCS Printer Support (6.1 and 7.1)	57xx-SOC	Rational Developer for i for SOA Construction
5761-CM1	Communications Utilities	57xx-ST1	DB2 Query Manager and SQL Dev Kit for i
5761-DB1	System/38 Utilities	57xx-WDS	Rational Developer Studio
5761-DP4	DB2 DataPropagator	57xx-XW1	IBM i Access Family

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CBU for i Overview

- IBM i is only licensed to the machine on which it was originally purchased and requires hardware serial-specific license keys
  - The Capacity Backup (CBU) offering modifies IBM i licensing terms and allows you to *temporarily* transfer IBM i entitlements from your primary machine to a CBU machine, saving the cost of purchasing full IBM i entitlement for the CBU machine (there is minimum IBM i licensing required on the CBU machine). This can provide a significant benefit to customers.
  - The CBU offering is different from the IBM i Processor and User Transfer offering, which also modifies IBM i licensing terms but permanently transfers IBM i entitlements to another machine

CBU for i Overview

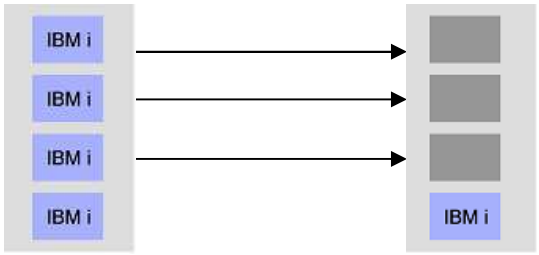
- A CBU is a Power server ordered with a CBU specify feature code
  - **Registration** of the primary system and CBU pairing and acceptance of the CBU terms and conditions are required prior to CBU order fulfillment
- The primary system must be of equal or higher software tier (processor group level)
- A CBU machine requires a *minimum* of one IBM i processor entitlement; P05 and P10 tier models also require a minimum block of user entitlements (5 or 10 users, respectively)
  - All productive workload running on the CBU is required to be licensed, e.g., replication services are considered productive workload
- The primary and CBU machines must be in the same enterprise
- The CBU feature may only be ordered on the purchase of a new server or type/model upgrade – plant orders only
  - The licensing terms of the CBU are only available to the original owner of the CBU machine and are not transferrable to another party
- The designation of primary system and CBU cannot be switched

Power Systems CBU for i

- **Offering for**
  - IBM i HA/DR environments
  - Consolidation environments (AIX, i and Linux)

- **Offering Features**
  - *IBM i &* 5250 Enterprise Enablement (OLTP) temporary entitlement transferability for HA/DR operations

- **Offering Supports**
  - Temporary transfer of IBM i processor *entitlements* from primary to CBU system
  - Two year temp keys for eligible LPPs on CBU
  - Transfer of AIX and Linux licenses for HA operations business as usual
  - Registration required for i operation system environments



Primary ≥ **CBU**

Software tier primary ≥ Software tier CBU

- **Prerequisites**
  - Order CBU specify code when ordering a Power server
  - Minimum one processor entitlement of IBM i for all models and user entitlements (5 users for P05 and 10 users for P10)
  - Must have as many IBM i entitlements on the CBU as is required for replication workload
  - Primary server must be of equal or higher software tier
  - **Registration** of primary system and CBU is required prior to CBU order fulfillment
  - CBU feature may only be acquired upon purchase of a new box or via a model/type upgrade

http://www.ibm.com/systems/power/hardware/cbu/

Traditional CBU licensing example – two system, one customer topology

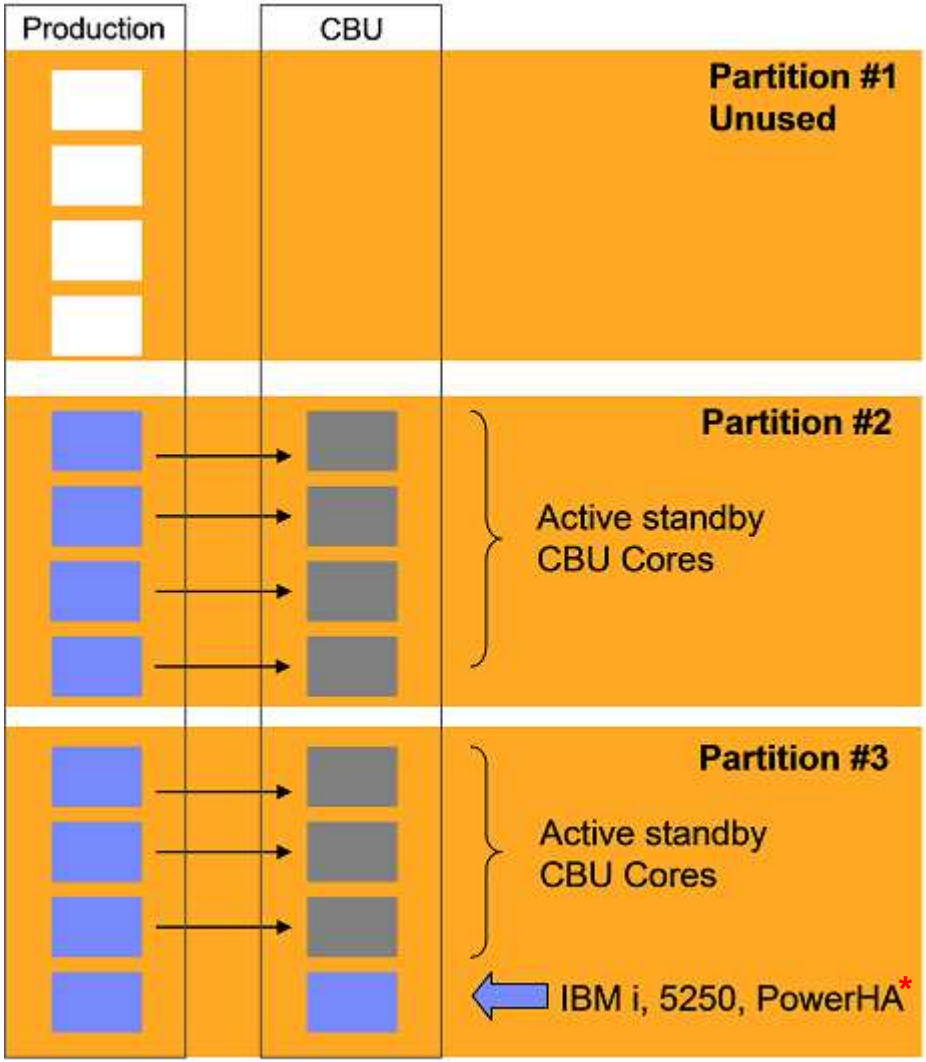
Planning

- **CBU allows IBM i operating system entitlement fail-over from the registered production server**
  - Minimum 1 entitlement required on the CBU box*
  - CBU server allows the temporary transfer of entitlements from primary server for non concurrent usage on the CBU server
  - Round-up when using partial processors
  - 3.5 processors = 4 entitlements
  - One customer

Example

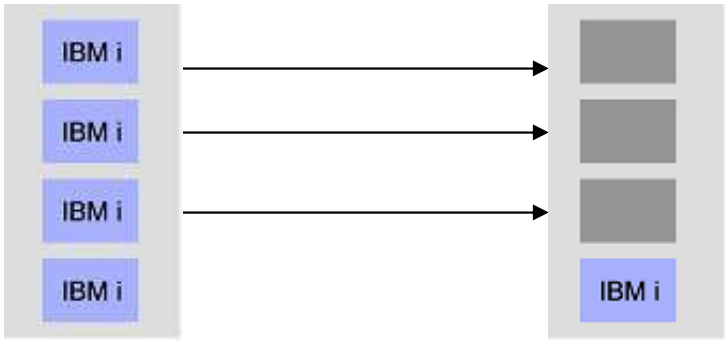
- **No HA/DR required for Partition 1**
  - No IBM i or PowerHA licenses
- **HA required for Partition 2 and 3**
  - All processors in the production server partitions 2 and 3 are licensed for IBM i and PowerHA
  - One key, 8 entitlements
  - The license key will be a permanent key installed on partition 2 and 3
- **A single processor is licensed on the CBU server**
  - One key, one entitlement
  - The non-OS LPPs will be temporary keys for 8 cores good for two years installed on partitions 2 and 3

* if the HA/DR solution requires more than one core on CBU to run replication services, those extra cores must also be licensed.



*** PowerHA is used as an example and is not required for CBU**

Power Systems Capacity Backup Edition (CBU for i) - overview



One core is the minimum permanent entitlement required; however any production workload requires permanent licenses (for example, replication workload)

Software tier primary ≥ Software tier CBU

- The CBU offering is used in high availability and disaster recovery deployments
- Offering enables customers to move workload between boxes without fully redundant OS entitlements
- Two year temporary keys eliminate redundancy for eligible LPPs
- CBU designation available only upon purchase of/upgrade to a new server and must be registered to a qualified primary
- If a CBU is no longer affiliated with the original registering customer, it is not recognized as a CBU
- Registration process: client agrees to terms and conditions, CBU registration is validated, shipment is approved
- CBU agreement requires that both the primary and CBU are owned by the same enterprise

CBU for IBM i registration

Additional Definitions

- Virtual CBU (VCBU):

  A logical partition on a CBU machine:

  - A client may have more than one Primary Machine registered to a CBU Machine provided that each Primary Machine has a dedicated corresponding virtual CBU partition
  - VCBU is a concept: there is nothing special to order, install, etc.

- Service Provider (SP):

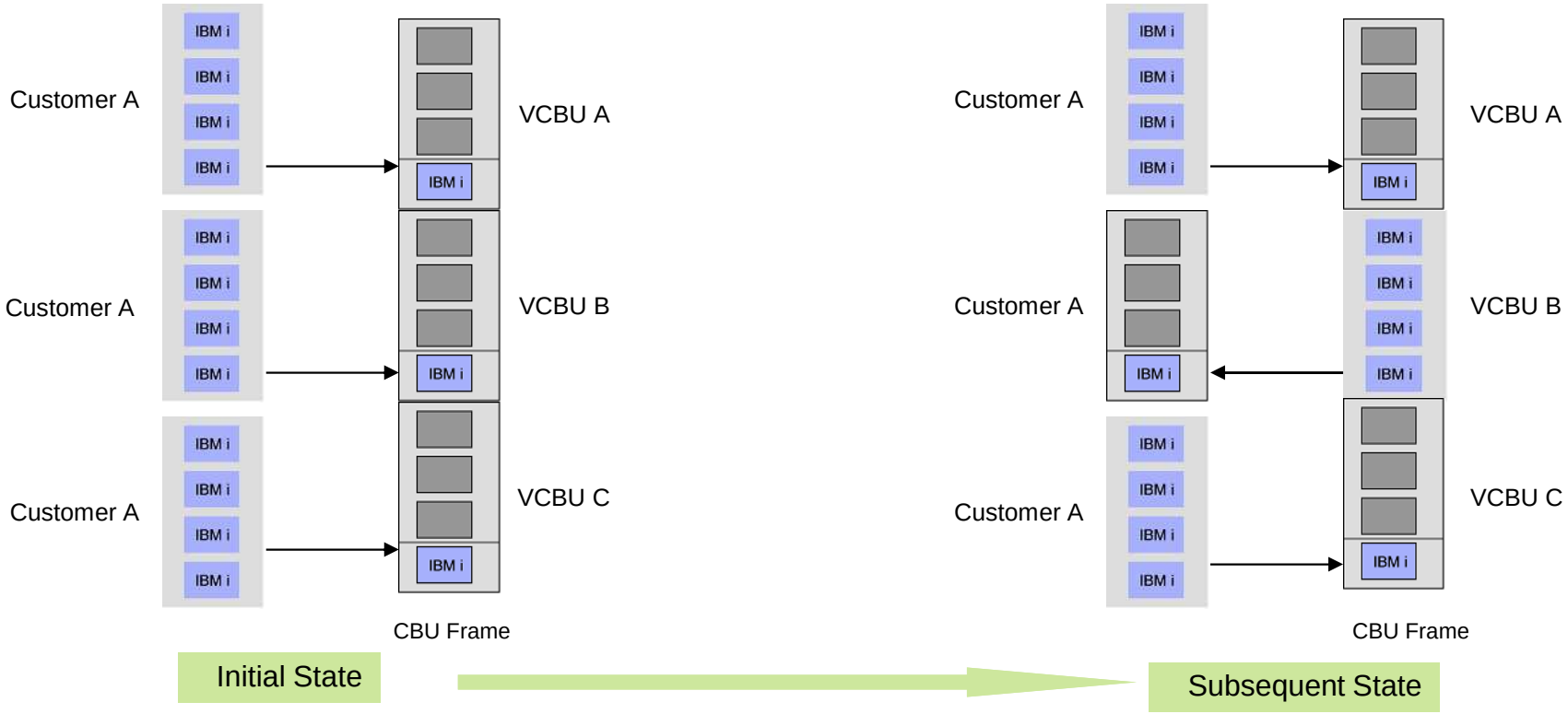
  A company that is hired by clients outside the company's enterprise to perform certain IT services (such as hosting workloads) on an ongoing basis, for an agreed upon fee as specified in a service level agreement or other contract

  Includes Managed Service Provider, Cloud Service Provider, etc.

Multiple primary systems, one customer, traditional CBU topology

- Each primary system is registered to a stand-alone CBU server
- Each CBU has a minimum of one processor core licensed (more as required to support workload)
- Primary and CBU are owned by the same enterprise

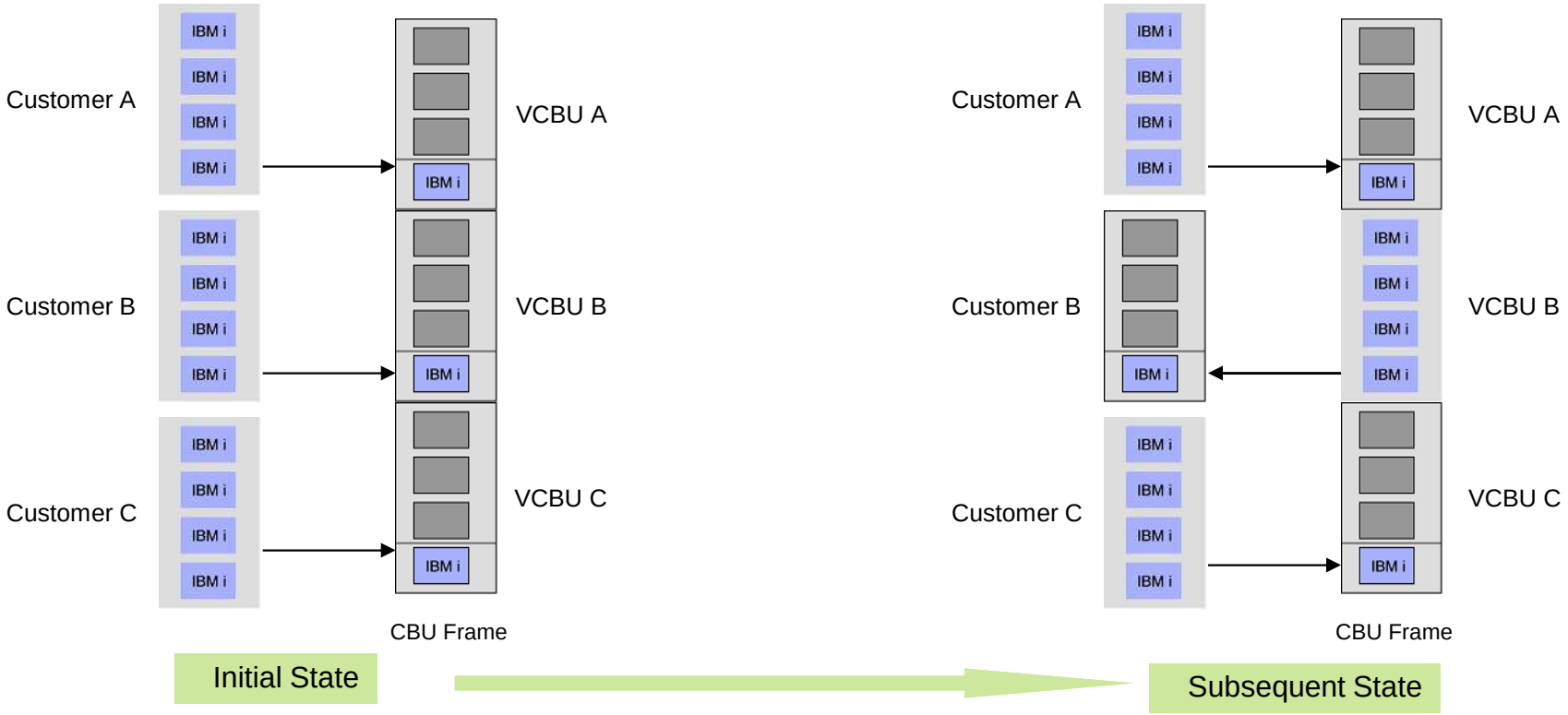
Multiple primary systems, one CBU – Virtual CBU (VCBU)



- Each primary system is registered to the CBU Frame, same enterprise
- Each primary system has a corresponding dedicated VCBU partition on the CBU frame
- Each VCBU partition has a minimum of one processor core licensed (more as required to support workload)
- The assigned processing units and assigned virtual processors for the VCBU partition must be set to the minimum entitled cores prior to workload failover. The maximum processing units and virtual processors are set to the number of entitlements that VCBU will expand to at a workload failover.* (inverse operation on the primary partition post failover)
- Electronic Service Agent (ESA) installed and running on each of the primary systems and the CBU frame

*capped partition not required for shared disk cluster application partitions

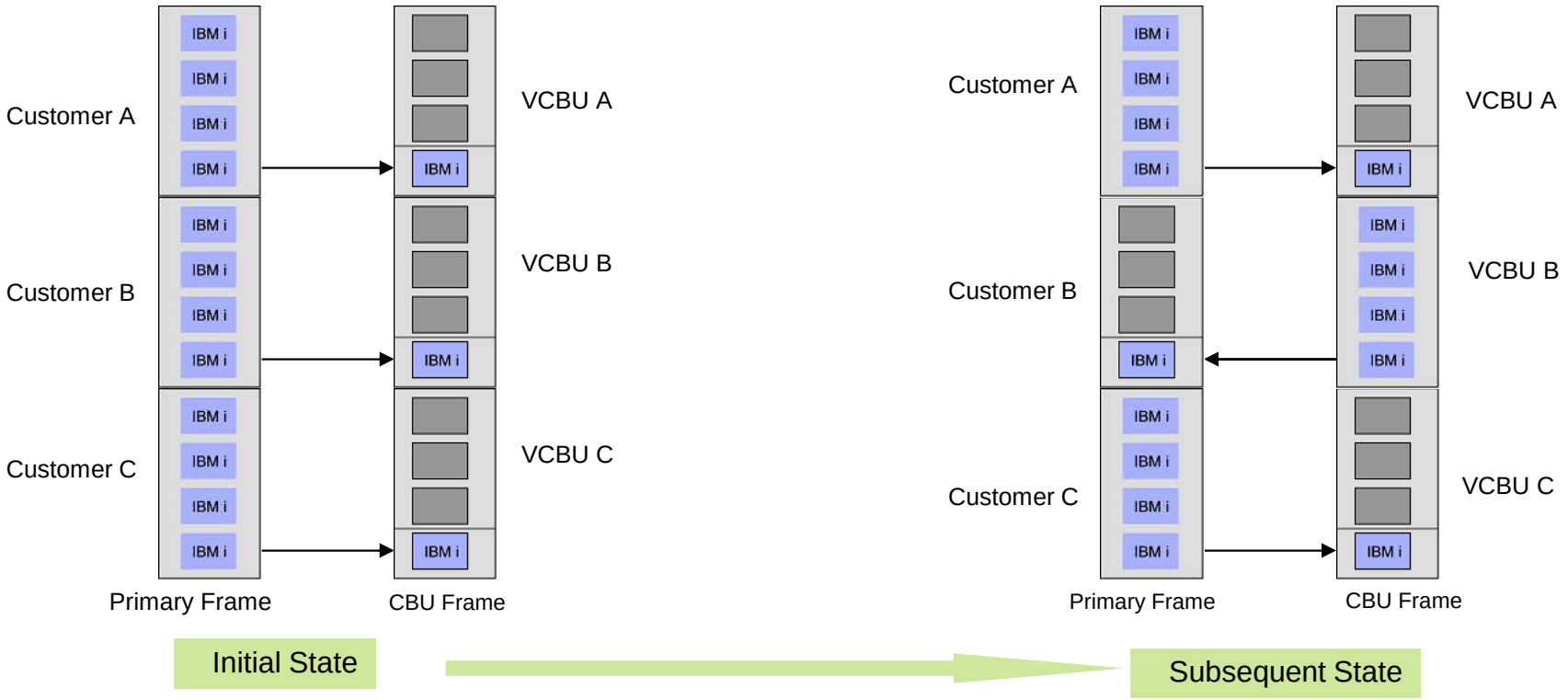
Multiple primary systems, SP deployment – Virtual CBU (VCBU)



- Each primary system is registered to the CBU Frame, all servers owned by the SP
- Each primary system has a corresponding dedicated VCBU partition on the CBU frame
- Each VCBU partition has a minimum of one processor core licensed (more as required to support workload)
- The assigned processing units and assigned virtual processors for the VCBU partition must be set to the minimum entitled cores prior to workload failover. The maximum processing units and virtual processors are set to the number of entitlements that VCBU will expand to at a workload failover.* (inverse operation on the primary partition post failover)
- ESA installed and running on each of the primary systems and the CBU frame

*capped partition not required for shared disk cluster application partitions

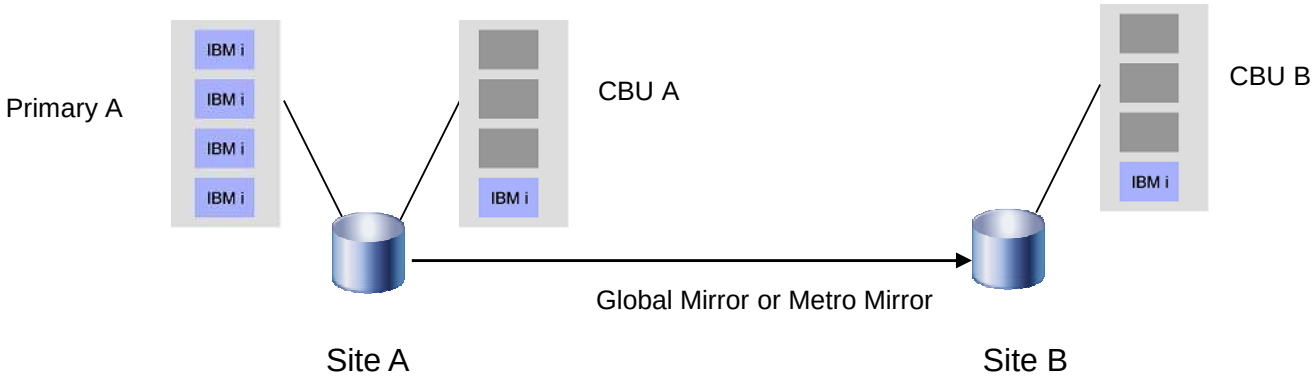
Single primary system, multiple customers, SP deployment



- Each primary system is registered to the CBU Frame both servers owned by the SP
- Each primary partition has a dedicated VCBU partition
- Each VCBU has a minimum of one processor core licensed (more as required to support workload)
- The assigned processing units and assigned virtual processors for the VCBU partition must be set to the minimum entitled cores prior to workload failover. The maximum processing units and virtual processors are set to the number of entitlements that VCBU will expand to at a workload failover.* (inverse operation on the primary partition post failover)
- ESA is installed and running on each of the primary systems and the CBU frame

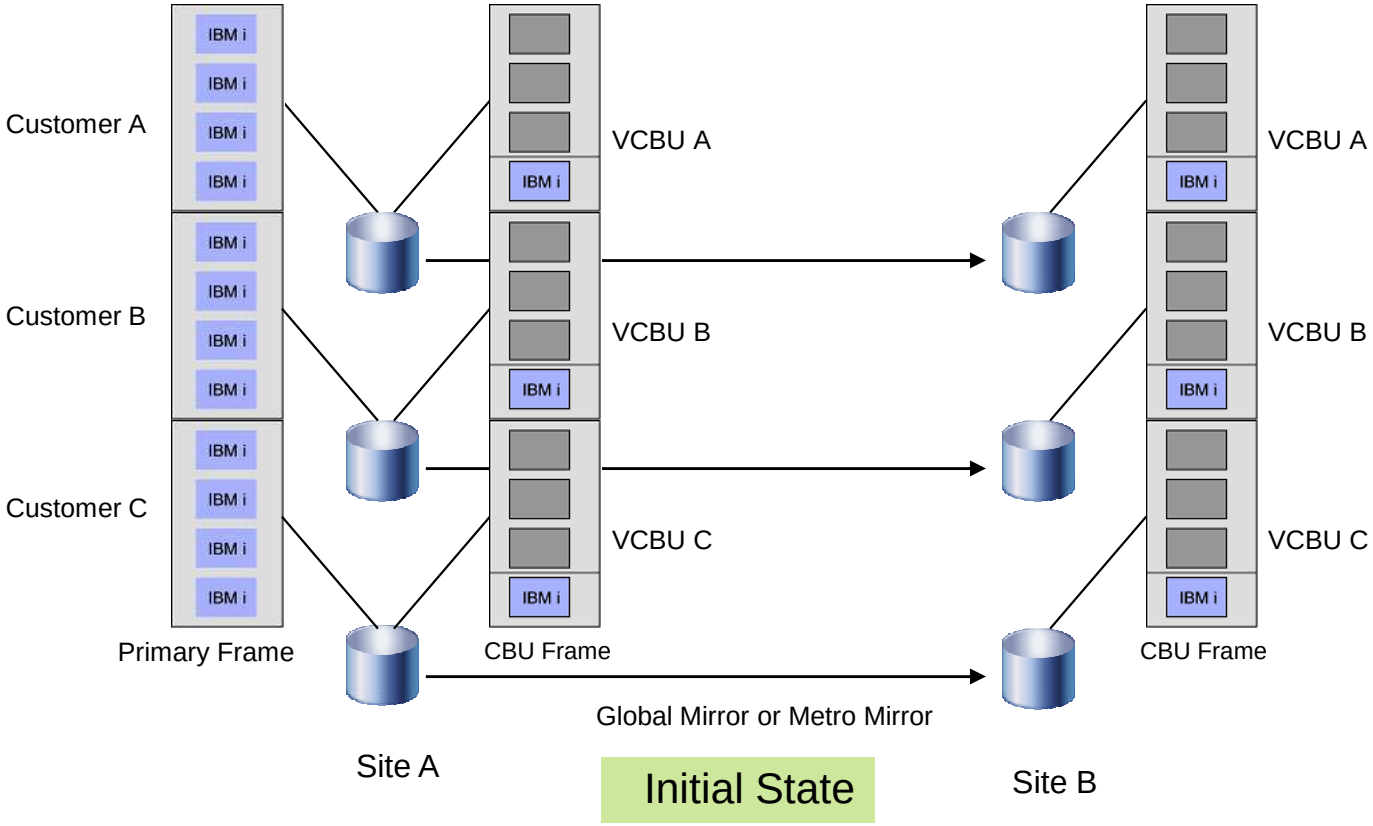
*capped partition not required for the shared disk cluster application partitions

One Customer, three system, two-site CBU topology



- Each CBU is registered to the primary system, same enterprise
- Primary frame A and CBU frame A at Site A, CBU frame B in DR Site B
- Each CBU has a minimum of one processor core licensed
- Licensed cores on Primary and CBU must be capped for non shared storage configurations
- All servers are in a single PowerHA cluster in this example

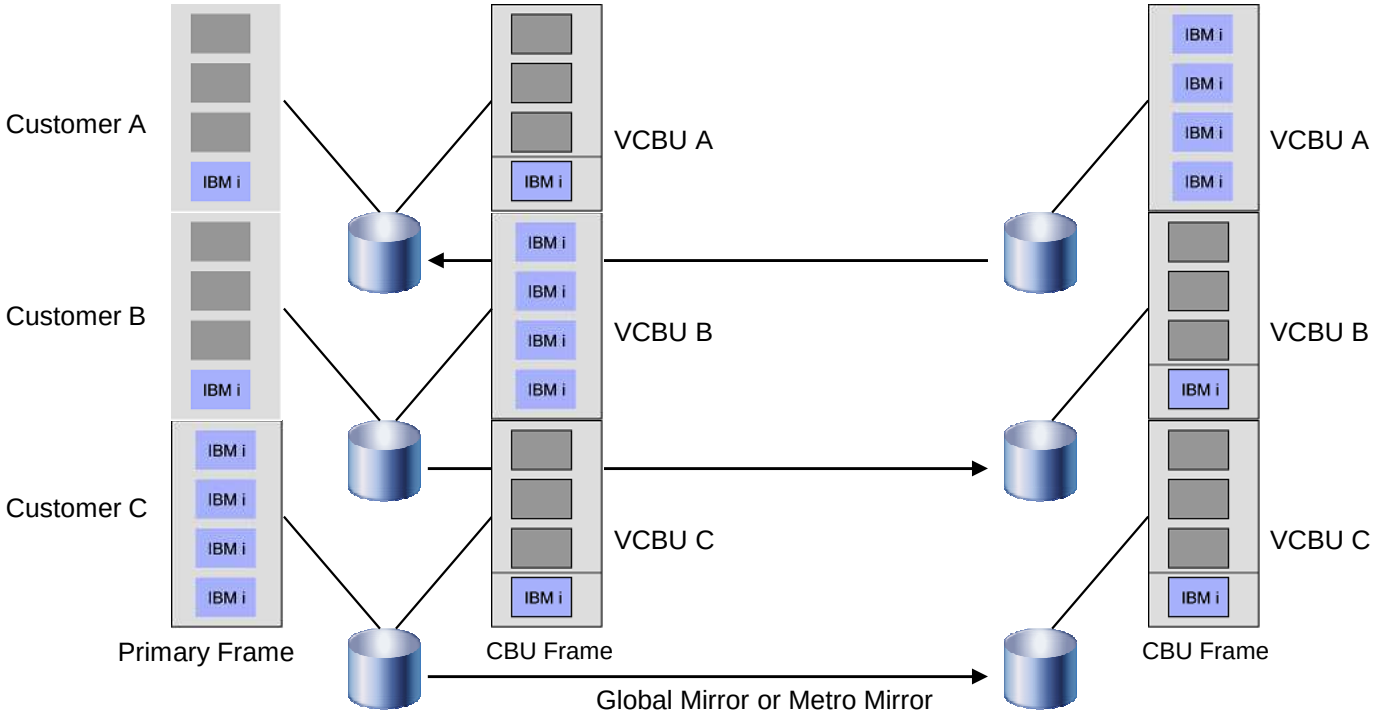
Three system, two- site CBU SP topology, Initial State



- Each CBU is registered to the primary system, all servers owned by the SP enterprise
- Primary frame A and CBU frame A in Site A, CBU B in DR Site B
- All servers are in a single PowerHA cluster in this example
- Each CBU has a minimum of one processor core licensed (more licensed as workload requires)
- The assigned processing units and assigned virtual processors for the VCBU partition must be set to the minimum entitled cores prior to workload failover. The maximum processing units and virtual processors are set to the number of entitlements that VCBU will expand to at a workload failover.* (inverse operation on the primary partition post failover)

*capped partition not required for the shared disk cluster application partitions

Three system, two-site CBU SP topology, Production State



- Each CBU frame is registered to the primary system, all systems owned by the SP enterprise
- All servers are in a single PowerHA cluster in this example
- Each CBU has a minimum of one processor core licensed (more licensed as workload requires)
- The assigned processing units and assigned virtual processors for the VCBU partition must be set to the minimum entitled cores prior to workload failover. The maximum processing units and virtual processors are set to the number of entitlements that VCBU will expand to at a workload failover.* (inverse operation on the primary partition post failover)

*capped partition not required for the shared disk cluster application partitions

CBU for IBM i Temporary Transfer Procedure

- A software key tells each system's license manager how many IBM i processor license entitlements are entitled on each system. If the client ever runs or assigns more IBM i work than the system has entitlements, messages are issued to the operator indicating the IBM is out of license compliance. By the terms of the IBM licensing agreement, the client must then bring the IBM into compliance by either a) reducing IBM i workload or b) adding IBM i processor license entitlements.

- Accepting the terms of the CBU license agreement, which allows the temporary transfer of IBM i, documents that IBM and the client understand when entitlements can be transferred from the primary to the CBU system.

- IMPORTANT: When IBM i entitlements are temporarily transferred to the CBU system, the software keys are not altered on either machine. Thus the CBU system will issue the out-of-compliance messages when the workload fails over from the primary. The CBU license terms give permission to the client under this situation to ignore these messages. The client agrees to monitor the IBM i usage on both the primary and CBU systems to ensure the IBM i usage on the pair of machines does not exceed the total number of IBM i processor license entitlements.

- In addition to IBM i processor license entitlement, P05 and P10 processor group level systems have IBM i user entitlements. User entitlements are transferable from the primary to the CBU. If the primary system is an IBM i processor based system (P20 processor group or higher), and the CBU is a processor and user based system, you must purchase any required user entitlements on your CBU.

Primary and CBU Pairings

Refer to the CBU web site for the latest eligible primary and CBU pairings:
http://www.ibm.com/systems/power/hardware/cbu/register.html

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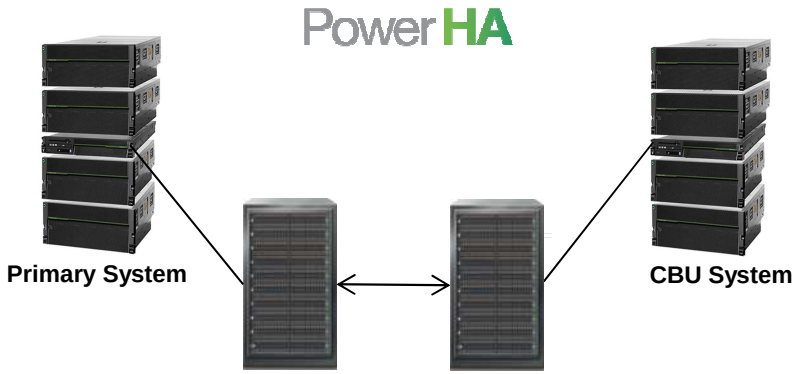
Announcing a new Power Systems Capacity Backup Offering

Buy a CBU system for HA / DR at 30% the cost of your production system

Primary System	
System HW	$1.06 M
Software (AIX + PowerHA)	$346 K
HWMA	$114k
Total	$1.53 M

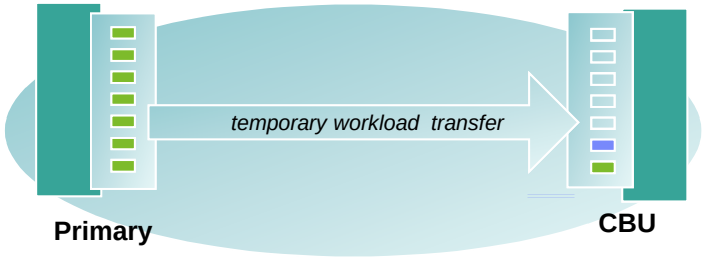


CBU System	
System HW & HWMA	$431 K
% of Primary	30%

- Capacity Backup (CBU) for Power System E880 customers
- PowerHA for AIX and PowerHA for IBM i
- Fast failover to ***active*** processors and memory on the CBU

- Example case is for a 128 core production E880 system with PowerHA for AIX

Power Systems Capacity Backup Edition (CBU with PowerHA) - overview



- The CBU for PowerHA offering is used in high availability and disaster recovery deployments
- Key difference between failover using Enterprise Pools and CBU is the time it takes to conduct a failover or role swap operation
  - It can take several minutes when using Enterprise Pools to release and acquire memory resources for each partition
  - For example, to add 256GB of memory to the partition, it can take 3 or 4 minutes, the more being added, the longer the time, to release that same memory it can take two hours, (PowerHA acquires the memory resources asynchronously to releasing them on the primary system so failover doesn't wait for the release of the memory resources)
- The CBU for PowerHA has active standby processor and memory resources for immediate transfer of workload

Power E880 HA/DR Financial Alternatives (3 year TCA)

Production System

Total	$1.526m
HW	$1.066m
SW & SWMA	$346k
HWMA	$114k

All Active System

Total	$1.526m
HW	$1.066m
SW & SWMA	$346k
HWMA	$114k

-or-

CBU System

Dedicated Capacity Backup
Fast Failover (0 extra time for Memory acquisition)

Total	$431k
HW	$406 K
SW & SWMA	5k
HWMA	$20k

-or-

Power Enterprise Pools System

Flexible usage / additional workload
10-15 minutes per TB for memory acquisition

Total	$620k
HW	$595k*
SW & SWMA	$5k
HWMA	$20k

*includes static to mobile conversion

-or-

Power Enterprise Pools System

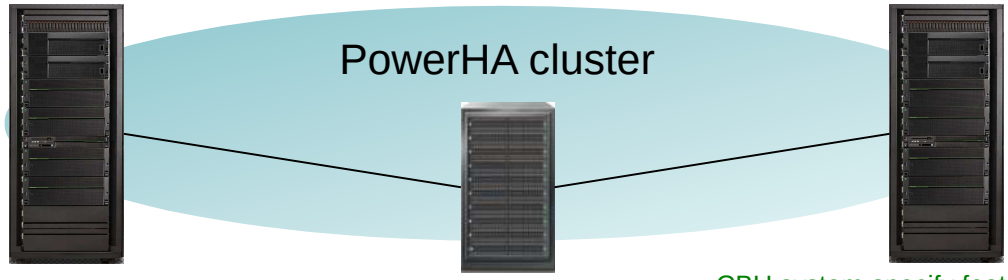
Flexible usage / additional workload
Purchase Active Memory
Fast Failover (0 extra time for Memory acquisition)

Total	$666k
HW	$641k*
SW & SWMA	$5k
HWMA	$20k

*includes static to mobile core conversion and additional static memory activation

Example is a 96/128 and 1TB/2TB Power E880 production system with AIX and 50% of cores licensed with PowerHA

Power E880 Servers in a CBU for PowerHA configuration



CBU system specify feature code: EB3J

Power E880 Primay System:

- 4.35 GHz or 4.0 GHz system
- 1 to 4 nodes per system
- Node feature codes: EPBB, EPBD
- N cores of PowerHA entitlements
- 75% of installed processors must be active and licensed with AIX and/or IBM
- Must have a minimum of 8 PowerHA processor entitlements
- 50% DIMM memory active

Power E880 CBU System:

- 4.35 Ghz or 4.0 Ghz system (must match primary)
- 1 to 4 nodes per CBU system*
- Node feature codes:EPBG,EPBH,EPBB,EPBD
- Maximum of 8 active cores
- 365 x N-8 = # of no charge ECOD processor days
- 365 x N-8 x 32 GB no charge ECOD memory days
- 25% of DIMM memory active

*Select processor nodes from:

- No charge processor nodes: EPBG, EPBH
- One or two nodes on the primary = 1 no-charge node on the CBU
- Three or four nodes on the primary = 2 no-charge nodes on the CBU
- For charge processor nodes: EPBB, EPBD

Order Process/Registration

- Prior to ordering the CBU for PowerHA fill in the worksheet posted on the CBU registration website to determine minimum configuration requirements and no charge processor node and ECOD (Elastic COD) activations
  - Submit CBU entitlement worksheet (pwrhacbu@us.ibm.com)
  - IBM verifies client configuration entitlements (no charge processor nodes and ECOD days)
- Customer agrees to CBU terms and conditions via registration website
- Send configuration files to pwrhacbu@us.ibm.com
- After project office approval, order the approved CBU configuration
  - Specify the # of no charge processor nodes (EPBG or EPBH)
  - Econfig will automatically add the CBU system feature code: EB3J
- After CBU system is installed, configuration of Primary and CBU system is sent to pwrhacbu@us.ibm.com
  - CBU project office will apply the appropriate number of ECOD days to Power E880 CBU system
- Implement TCOD (temporary COD) via standard process
  - TCOD contract signed by client
  - ECOD enablement codes ordered via MES

Registration website: http://www.ibm.com/systems/power/hardware/cbu/

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Designated Backup Machine (DBM)

- The DBM is distinct and separate from the CBU offering
- Can be a new or used machine, is paired with at least one primary machine
- The primary system's CPW rating must be greater than or equal to the CPW rating of the DBM
- All processor cores used for backup recovery services, including those used to create and or manage the backup recovery environment, must be licensed
  - I.e., IBM i operating system entitlements are not temporarily transferable as in the case of the CBU offering. IBM i entitlements are required on the DBM for all IBM i workload which can run on the DBM

Designated Backup Machine (DBM)

- Two-year temporary keys for the non-OS LPPs for the DBM are available by completing the form TEMPORARY KEY REQUEST FOR BACKUP MACHINES
  - Upon approval, temporary keys are generated for the DBM for all of the primary system's entitled LPPs
  - Any LPPs for which temporary keys are acquired…
    - May not be used concurrently on primary and DBM
    - Can only be used for backup recovery purposes and not for production

- A client may use one DBM to backup multiple primary machines by creating a partition on the DBM which meets CPW requirements
  - When submitting the Temporary Key Request form, the client is required to provide verification that the CPW rating of the DBM partition does not exceed the CPW rating of the client primary (i.e. from the HMC, show the processors allocated on the client's partition)

- Is SWMA required on the DBM?
  - If you need software service or software upgrades on the DBM, acquire SWMA on the DBM serial
  - If you upgrade the entitlements on the primary system, you will need SWMA on the DBM in order to get upgraded temporary keys for the LPPs

Designated Backup Machine (DBM)

DBM for Service Providers?

- Subject to the same requirements as previous page

- A Service Provider can own the DBM while the primary systems are owned by the end client, i.e., unlike CBU, the primary machines and DBM are not required to be in the same enterprise

  – When submitting the Temporary Key Request form, the SP is required to provide verification that the CPW rating of the DBM partition used to back up the client primary does not exceed the CPW rating of the client primary machine (i.e. from the HMC, show the processors allocated on the client's partition)

- **Question:** I am a Service Provider with 50 clients and one DBM. How many IBM i operating system entitlements do I need on the DBM?

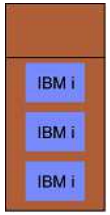
  Answer: Acquire IBM i entitlements for all concurrent workload which will run on the DBM

DBM Example Configurations

1. Client has one primary and one DBM
2. Client has multiple primaries and one DBM
3. Multiple clients hosted by a Service Provider with one DBM

1. DBM Example: Client has one primary and one DBM

CPW Primary ≥ **CPW DBM**

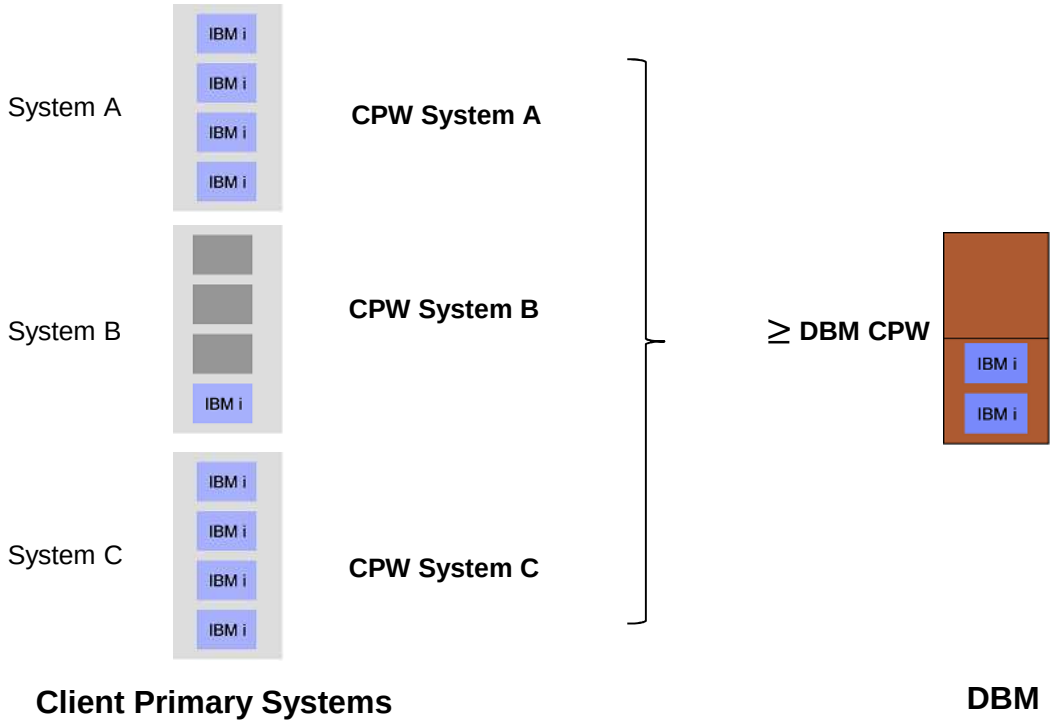


Based on the CPW rating of the DBM, the IBM i workload could use more or less processor cores than on the primary system. In this example, four processor entitlements on the primary only requires 3 processor entitlement on the DBM.

Client Primary System

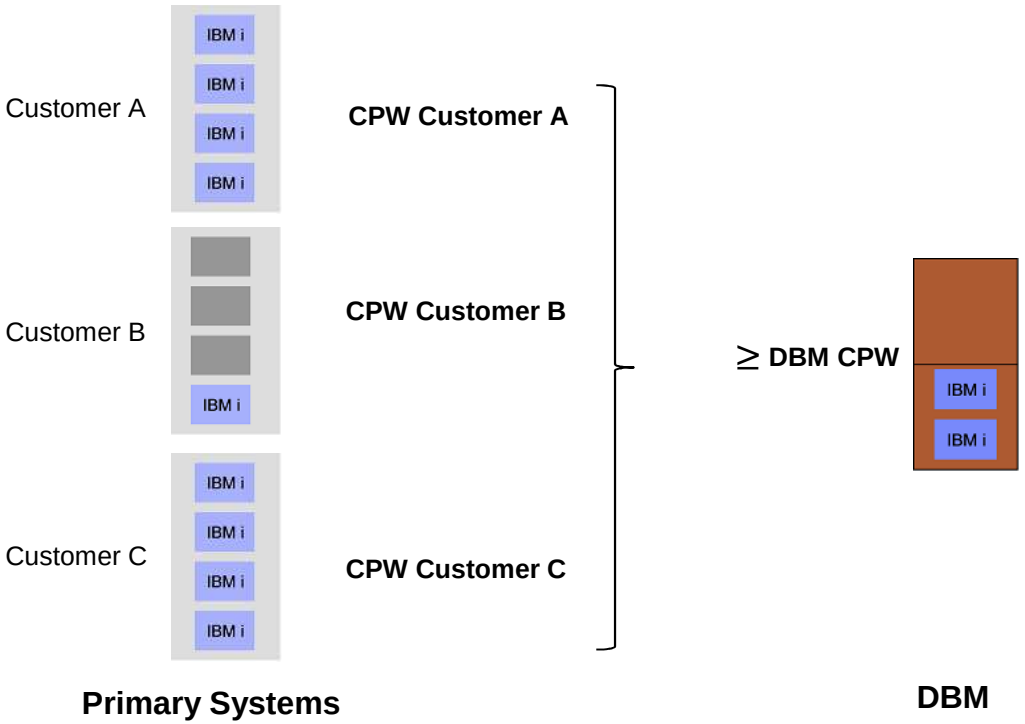
Client DBM

2. DBM Example: Client has multiple primaries and one DBM



- When submitting the Temporary Key Request form, the client is required to provide verification that the CPW rating of the DBM partition used to back up the primary does not exceed the CPW rating of the client primary (i.e. from the HMC, show the processors allocated on the client's partition)

3. DBM example: Client has multiple primaries and Service Provider has one DBM



- Client owns the primary machines
- SP owns the DBM
- CPW of DBM is less than or equal to CPW on primary environments
- When submitting the Temporary Key Request form, the SP is required to provide verification that the CPW rating of the DBM partition used to back up the client primary does not exceed the CPW rating of the client primary machine (i.e. from the HMC or IVP, show the processors allocated on the client's partition)
- SP acquired IBM i entitlements for all concurrent workload which will run on the DBM

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Summary Comparison of CBU and DBM:

- **CBU:** allows temporary transfer of IBM i operating system entitlements from primary to CBU
  DBM: no temporary transfer of IBM i. All IBM i operating system must be licensed for workload running on DBM

- **CBU:** must be in the same enterprise as the primary
  DBM: a service provider can own the DBM and provide backup services to machines owned by clients

- **CBU:** processor group size of primary must be greater than or equal to processor group size of CBU
  DBM: CPW rating or primary must be greater than or equal to CPW rating of DBM

- **CBU:** designation may only be acquired at the time of purchase and must be either a new machine or a machine-type-model upgrade; only available to original owner of machine
  DBM: can be a new or used machine

- **For both CBU and DBM:** can request temporary keys for LPPs (subject to requirements)

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Temporary Key Request Form

Request the latest form by sending an email WWSWKEYS@dk.ibm.com

REQUEST FOR DESIGNATION OF PRIMARY AND BACKUP MACHINE PAIRING
(Request Temporary Keys for a Backup Machine)

The same form is used for CBU and DBM temporary keys

	Type-Model	Serial Number	Processor Group	Customer Number
	(Ex, 9117-MMC)	(Ex, 10-12345)	(Ex, P30)	(where licenses reside)
Backup Machine	_____	_____	_____	_____
Primary Machine	_____	_____	_____	_____

Is the Backup machine an IBM registered Capacity Backup ("CBU") Model? Yes_____ No_____

Temporary keys…

- are issued for LPPs which are not used concurrently on the primary and backup
- are not issued for IBM i operating system processors (feature 5051) or users (feature 5052)
- are generated for all primary system entitled LPPs rather than having to list the LPPs on the form
- Must be renewed every two years (use the same request form for renewal)

Changes will be ready November 2015:

– BPs or IBM will be able to submit the form to the Key Center rather than only IBMers

Temporary Key Request Form

If you have multiple primary machines being backed up to a single DBM, submit separate Temporary Key Request forms for each primary

Examples:

- A client has three primary machines and one DBM. The client should submit three Temporary Key Request forms, one for each primary

- A Service Provider has one DBM backing up four client primary machines. The SP should submit four Temporary Key Request forms, one for each client primary

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Hot/Warm/Cold Backup Solution Definitions

Hot Backup Solution:

- One in which the replication workload is executed by the backup machine processors and the replicated data on that backup machine can be accessed for manipulation such as queries. Examples of hot backup solutions are logical replication and active/active database topologies.

Warm Backup Solution:

- One in which data is either switched between systems or replicated between storage subsystems, and the switched or replicated data cannot be accessed by the backup systems or nodes until a fail-over event has occurred. A warm backup solution will have health monitoring such as heart beating and will allow snapshot or point-in-time copies to be made available for tape backup and/or for manipulations such as queries. Examples of warm backup solutions are shared-storage clustering solutions or storage subsystem replication solutions with monitoring and/or automated restart software.

Cold Backup Solution:

- One in which the data on the primary machine is saved to removable media (e.g., tape), or the data on the primary machine is replicated by a storage subsystem technology with no monitoring function or any other type of automation software present. The removable media or replicated data is subsequently used to restore that data to a backup machine via an IPL or save restore process.

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Using CBU or Designated Backup Machines for Disaster Recovery Tests

CBU and Designated Backup Machines (DBM) allow a variety of high availability/disaster recovery configurations, enabling you to fail or fall over the workload from the primary machine to the backup machine while vacating the workload on the primary machine. Licensed products can be used on the primary or backup machines (whether the backup machine is a CBU or DBM) but cannot be used on both unless permanent licensing exists on both machines. However this chart defines one exception: it defines specific testing which allows you to use licenses on both machines concurrently, within the limits set forth below.

"Disaster Recovery Testing" is defined as a compliance test designed to validate readiness to recover all aspects of IT operations at a remote location. Disaster Recovery Testing of this nature may require the concurrent use of program licensing on the primary and the disaster recovery environment for a period of time. **This Disaster Recovery Testing does not apply to hot backup solutions.**

When you use program licenses on your primary and backup machines concurrently for the purpose of Disaster Recovery Testing (not performing actual role swap operations), you are authorized to run two annual tests lasting up to 72 hours each to validate your disaster recovery capabilities. These tests cannot include any productive work, development, program testing, or maintenance. A disaster is defined as an outage event whereby the entire data center is rendered inoperable due to some external force such as a fire, earthquake, flooding, acts of terrorism, and the like. An outage such as a hardware or software failure is not considered a disaster event. Therefore, the periodic Disaster Recovery Testing must occur at a separate location other than the production data center, at a minimum, at a separate building.

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PowerHA Tools for IBM i – Lab Services

PowerHA Tools for IBM i	Capability	Benefit	DS8000	Storwise	Internal
Smart Assist for PowerHA on IBM i	Provides operator commands and scripts to supplement PowerHA installation and ongoing operations for IASP enabled applications.	Simplifies deployment and ongoing management of high availability for critical IBM i applications.	**Yes**	**Yes**	**Yes**
IASP Copy Services Manager (Automated recovery with faster IASP-level vary on, no system IPL)					
Flashcopy	Automates Flashcopy of IASP for daily off-line backup with seamless BRMS integration.	Increases application availability by reducing or eliminating backup window for routine daily backups.	**Yes**	**Yes**	
LUN-level Switching	Simplifies deployment and automates switching of an IASP between IBM i cluster nodes in one data center.	Enables a business continuity manager to provide a simple, single site HA solution.	**Yes***	**	
Metro Mirror or Global Mirror	Simplifies initial deployment and automates ongoing server and storage management of two-site Metro Mirror or Global Mirror HA or DR solutions. Requires IASP enabled applications..	Enables a business continuity manager to provide seamless operation of integrated server and storage operations for two-site high availability or disaster recovery.	**Yes**		
Metro Global Mirror (MGM)	Extends PowerHA functionality to provide three-site server/storage replication solution combining Metro Mirror for HA with Global Mirror for DR. Requires IASP enabled applications and IBM Tivoli Productivity Center – Replication (TPC-R).	Enables a business continuity manager to further lower business risk and maximize business resilience for highly critical business applications that require three-site HA/DR protection.	**Yes**		
Full System Copy Services Manager (Automated recovery, requires full system IPL)					**XIV**
Flashcopy	Automates full system Flashcopy for daily off-line backup with integrated support for BRMS without IASP-enabled applications.	Increases application availability by reducing or eliminating backup window for routine daily backups. Enables an entry solution while planning IASP enablement.	**Yes**	**Yes**	**Yes**
Metro Mirror or Global Mirror	Simplifies initial deployment and automates ongoing server and storage management of two-site Metro Mirror or Global Mirror HA or DR solutions. without IASP-enabled applications.	Enables a business continuity manager to provide seamless operation of integrated server and storage operations for HA or DR. Enables an entry solution while planning IASP enablement.	**Yes**	**Yes**	

*DS8000 support available with PowerHA Tools for IBM i 6.1 or earlier, included in PowerHA SystemMirror 7.1 and later **V7000 support included with PowerHA 7.1 TR6

IBM Lab Services Offerings for PowerHA for IBM i

PowerHA Service Offering	Description
IBM i High Availability Architecture and Design Workshop	An experienced IBM i consultant will conduct a planning and design workshop to review solutions and alternatives to meet HA/DR and backup/recovery requirements. The consultant will provide an architecture and implementation plan to meet these requirements.
PowerHA for IBM i Bandwidth Analysis	An experienced IBM i consultant will review network bandwidth requirements for implementing storage data replication. IBM will review I/O data patterns and provide a bandwidth estimate to build into the business and project plan for clients deploying PowerHA for IBM i.
IBM i Independent Auxiliary Storage Pool (IASP) Workshop	An experienced IBM i consultant will provide jumpstart services for migrating applications into an IASP. Training includes enabling applications for IASPs, clustering techniques, plus managing PowerHA and HA/DR solution options with IASPs.
PowerHA for IBM i Implementation Services	An experienced IBM consultant will provide services to implement an HA/DR solution for IBM Power Systems servers with IBM Storage. Depending on specific business requirements, the end-to-end solution implementation may include a combination of PowerHA for IBM i and/or PowerHA Tools for IBM i, plus appropriate storage software such as Metro Mirror, Global Mirror and/or Flashcopy.

For more information on PowerHA Tools for IBM i offerings and services, contact: Mark Even even@us.ibm.com 507-253-1313

www.ibm.com/systems/services/labservices stgls@us.ibm.com

Appendix:

- Lab Services PowerHA Offerings
- CBU Frequently Asked Questions

CBU Frequently Asked Questions

What happens if the CBU registration is not completed ?
- The order will not be fulfilled.
- If the server option is not able to be registered, it most likely means that the primary-CBU pairing is not supported

I have this server that I want to convert into a CBU: can I do that ?
- No. The only way to attain CBU designation is through the purchase of a new box or via a model upgrade
- You must include the CBU specify code when the upgrade is ordered

Can reverse the roles of my Primary and CBU via a record change process ?
- No. The only legitimate role change operation is when the workload is moved to and from the CBU. This is the purpose of the CBU offering; enabling role swap operations for the purpose of HA or DR operations.

Can I use the additional processors on my CBU for running an AIX application ?
- Assuming that you have sufficient capacity for your IBM i partition, you may use other processor cores for any purpose as long as you have purchased the processor activations and the commensurate operating system entitlements.

Can I use the additional processors on my CBU for running other IBM i workloads, not related to those that failover from the primary?
- Any workload that is licensed on the CBU can be hosted there. For example, you may have an AIX partition or an **IBM** i development partition used as a primary location. This is business as usual for those environments. The CBU Ts and Cs apply specifically to the primary and secondary IBM i HA/DR environments to be used for role swap purposes.

How many primary systems can I backup with my CBU ?
- One dedicated IBM i system or dedicated partition may be paired to a dedicated Virtual CBU (“VCBU”) partition for the purpose of role swap operations. Each primary-CBU pairing will be licensed as though they were both stand-alone boxes. Both the primary and the CBU must be owned by the same enterprise

CBU Frequently Asked Questions

Can a service provider use the IBM i CBU offering to support multiple clients ?

- Yes, as long as…
  - the service provider owns both the primary systems and the CBU systems, and
  - hosted clients are on dedicated primary and corresponding dedicated VCBU partitions or stand alone systems, and
  - licensing requirements are met. The licensing requirements for traditional single client to a single CBU apply to any type of pairing.

Can I register more than one CBU to a primary system ?

- Yes. This is a configuration typically associated with a PowerHA cluster implementation. You will register each CBU against one given primary system: tell us in the comment section that you will be registering more than one CBU to this primary. Each CBU will need to be able to be registered as though it were a stand alone server being registered to the given primary.

Are there any additional compliance conditions associated with multiple primary and/or multiple CBU topologies ?

- It is required that you install and run the IBM Electronic Service Agent (ESA) and send monthly reports.
- For implementations not based on storage-based clustering configurations, e.g. PowerHA, which inherently manage the production workload to access only one node in the cluster configuration at a time, it is required that the primary and CBU partitions be managed such that the assigned processing units and assigned virtual processors for the VCBU partition are set to the minimum entitled cores prior to workload failover. The maximum processing units and virtual processors are set to the number of entitlements to which VCBU will expand upon a workload failover. (The inverse operation will be performed on the primary partition post failover. The primary will be set to the minimum entitled cores)

I'm using logical replication, how many cores do I need licensed on the CBU ?

- Logical replication is a hot backup solution, and therefore all workload associated with logical replication must be permanently licensed. If it requires two cores to process replication on the CBU, those must be permanently licensed.

CBU Frequently Asked Questions

How do I license multiple primary systems (partitions) and CBU partitions ?

- If you have multiple primary systems paired to a single CBU, each primary system will have its own dedicated CBU partition called a VCBU and the minimal OS entitlements will be purchased for each of the dedicated corresponding VCBU partitions per the terms and conditions.
- If you are an MSP hosting multiple clients, each client will have their own dedicated primary partition and a corresponding dedicated VCBU partition each of which is licensed as though they were stand alone systems (the minimal OS entitlements will be purchased for each of the dedicated corresponding VCBU per the terms and conditions)
- Think of each partition as being a separate system or “node” in a cluster topology. For each partition on the CBU which is paired to a primary partition via an HA/DR relationship, a minimum of one of the processor cores in that partition must have the entitlement to accommodate the transfer of entitlements from the corresponding primary partition.

What is the minimum required IBM i operating system entitlement on the CBU machine or VCBU partition ?

- That is determined by the number of cores required to support permanent resident peak workload on the CBU or VCBU if you’re hosting multiple primary servers. For example, if a data replication tool consumes 6 processor cores on a VCBU during a peak workload; there must be a minimum of 6 IBM i entitlements permanently installed on the CBU.

How do I license for environments where I have unlimited user entitlements and multiple customers ? How many user entitlements do I need to acquire for the CBU ?

- If you are planning to fail over a single client, the minimum number of user entitlements you will need to purchase for the CBU would be equal to the user entitlements required by the client with the largest number of user entitlements.

I have 10 customers each in a micro partition. Can I temporarily transfer one of them to the CBU ?

- No, only an entire processor entitlement is temporarily transferable.

CBU Frequently Asked Questions

Can I transfer all of my IBM i entitlements ?

- No. There will always be a minimum of one IBM i processor entitlement which is not transferable (and there will always be a minimum of one IBM i processor entitlement on the CBU). Note the minimum of one is not an absolute. If there is resident workload on the primary and/or CBU which is not temporarily transferred, those processor cores must be licensed permanently.
  - For example, replication workload requires IBM i processor entitlements (and 5250 Enterprise Enablement activations or IBM i user entitlements) to support that operation at peak workload on both the primary and CBU or VCBU.

I have a 750 primary and I would like to use a 720 as a CBU box, the 750 doesn't have user entitlements what do I do?

- You will need to purchase as many user entitlements on the CBU as you intend to use in the event of a failover

Can I have the primary system and CBU system in different countries ?

- There is no restriction in the CBU agreement that prevents this. It is not a consideration from a CBU terms and conditions perspective.

CBU Frequently Asked Questions

Can the CBU ever function as a stand alone production system ?

- The CBU is registered with a specific primary server and must remain so to be in compliance as a CBU. A box that is on the used market that was once a registered CBU is no longer recognized as a CBU and is not able to registered.

What type of HA or DR solution can I use with my IBM CBU for i?

- You may use any approach you choose including a cold/warm backup based on tape recovery.

If I am using a cold/warm backup solution for multiple primary systems, do I still need to have a VCBU for each partition ?

- If you are using a cold/warm backup recovery technology such as restore from a tape backup, and you can recover only one primary server at any given time, then you can host multiple primaries to a single CBU without implementing a VCBU configuration. If on the other hand you intend to recovery more than one primary at a time, each of those must have their own VCBU just as in the case of a hot backup technology.

What does “temporary” mean when used in the context of transferring optional IBM i user entitlements or optional IBM i processor entitlements ?

- Temporary means that the transferred entitlements “belong” to the primary system. If the primary system goes away, all optional transferred IBM i user entitlements, IBM i processor entitlements, and 5250 Enterprise Enablement remain with the primary system. When you initially configure your licensing topology, all transferable entitlements will be configured on the primary system. In effect you are entitled to run your production workload either on the primary partition or on the corresponding CBU partition but not concurrently.

CBU Frequently Asked Questions

For which Licensed Program Products (LPPs) can I get temporary keys for the CBU ?

- You can get temporary keys for the IBM i non-OS LPPs and IBM i OS optional features, which are delivered as part of the IBM i keyed programs.

How do I get temporary keys for the LPPs?

- The temporary key form can be requested from the Key Center at WWSWKEYS@dk.ibm.com.

Is SWMA transferable to the CBU ?

- No. If you would like IBM support and the ability to acquire software upgrades, you need active SWMA on the entitlements that you purchased for the CBU.

Is SWMA required on the primary in order to temporarily transfer IBM i to the CBU?

- No. Active SWMA is required on the primary in order to get IBM support and the ability to acquire software upgrades on the primary but is not required to temporarily transfer to the CBU.

Can I change my CBU back into a primary box ?

- If this machine is no longer going to function as CBU, you can submit an RPOMES order to remove the CBU feature 0444 from the HW.

Can I register an IBM i solution edition box as a CBU

- No. The CBU and Solution Edition are mutually exclusive offerings.

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