

iSeries
CUoD Planning Guide

**Permanent Capacity for
Model 825, 870, and 890**

February 14, 2003

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Preface

You knew you might need extra processing power to meet the demands of your e-business and you didn't want to impact your current operational commitments to get it ...

IBM offers a fast, non-disruptive method of activating "extra" processor capacity that is built directly into IBM eServer iSeries.

CUoD or On/Off CoD enable you to activate (no IPL and/or database reconfiguration) one or more central processors of a Model 825, 870 and 890 up to the maximum number of available standby processors.

CUoD (permanent capacity on demand)

- 1) Order an activation code to permanently turn on extra capacity

On/Off CoD (temporary capacity on demand)

- 1) Enable your server for the use of temporary capacity
- 2) Turn on and off capacity as you need it ... it's immediate!
- 3) Pay for the requested capacity at the end of each quarter

Purpose of Planning Guide

This guide will explain in detail all the aspects of planning for, purchasing, and managing an **IBM eserver iSeries with Capacity Upgrade on Demand** (permanent capacity). CUoD as defined in this document , is for the Model 825, 870 and 890 announced January 20, 2003 and made generally available February 28, 2003. **The latest set of V5R2 PTFs (CUM package dated 2/28/2003) is required.**

This guide is not a capacity planning document ... it will however point out key considerations when using capacity planning tools for a Model 825, 870, and 890.

Where to Get Help

The following information will help you quickly find the assistance you need.

Problem with collecting/transmitting required CUoD Data (VPD)

- => **Manual Process:** Fax required information to 507-253-4553 (If problems and/or questions, call the CUoD administrator at 507-253-7019)
- => **Electronic Process:** Use Electronic Service Agent to automatically send required information (Electronic Service Agent Users Guide is available at: http://publib.boulder.ibm.com/as400_sd/sdsadoc.html)

Problem with a Capacity Card (part failure)

- => Call your service provider
- => IBM service personnel can contact Level II support, in Rochester, to reset the appropriate capacity after the card has been replaced (refreshed Activation/Enablement Codes)

Problem with understanding technical details of Capacity Upgrade on Demand

- => Review appropriate sections in this Planning Guide
- => Work with Level II and/or Techline support in your geography

Problem with selling/marketing Capacity Upgrade on Demand

- => Review appropriate sections in this Planning Guide and other available materials at the following website: <http://www.ibm.com/eserver/series/hardware/ondemand>
- => Work with account teams and/or marketing specialists in your Geography

Planning Guide Feedback

You may directly contact the author of this Planning Guide if you have information that may be of assistance in updating the guide or making it a more useful Planning Guide.

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iSeries Capacity Planning

Capacity planning is a 'business as usual' value-add function of IBM's sales team. Any special considerations specific to iSeries Capacity Upgrade on Demand will be pointed out in this section. There is a comprehensive set of tools, resources and offerings available to aid IBMers, customers, and partners with capacity planning assistance.

When doing capacity planning for models with standby processors, one must plan ahead for any potential disruptive actions that would inhibit the full utilization of activated processor capacity. Some actions you may want to take prior to ever activating any processors are:

- Perform any I/O conditioning (e.g., new cages, or other I/O infrastructure)
- Perform memory upgrades
- Prepare LPAR partitions

Planning Ahead

By planning ahead, customers can accommodate the growth of existing workloads as well as handle new workloads without requiring a server outage.

Simply activating standby processors may not provide you with the full potential of capacity improvements you require. Other components of a server affect performance and overall throughput of workloads. By planning ahead and taking into account the complete server configuration, a customer can ensure they get the full benefit of processor activations.

iSeries Benchmark Center

IBM facilitates bench marking of customer and solution provider application environments. For more information, see their website at <http://www.as400.ibm.com/developer/cbc>.

iSeries Solutions Center -- Capacity Planning Services

Information regarding an IBM consulting service which can assist customers with their capacity planning needs can be found at the following website: <http://www-1.ibm.com/services/its/us/as400solutionctr.html>

Capacity Upgrade on Demand (CUoD)

iSeries CUoD was first introduced for the iSeries in the fall of 2002. At that time, CUoD was synonymous with permanent processor capacity. CUoD provided iSeries customers who purchased an iSeries model with standby capacity (un-activated at the time of purchase). This standby capacity, could be permanently activated for Planned Growth by purchasing a processor activation feature and entering the generated key at the server whenever the capacity was needed.

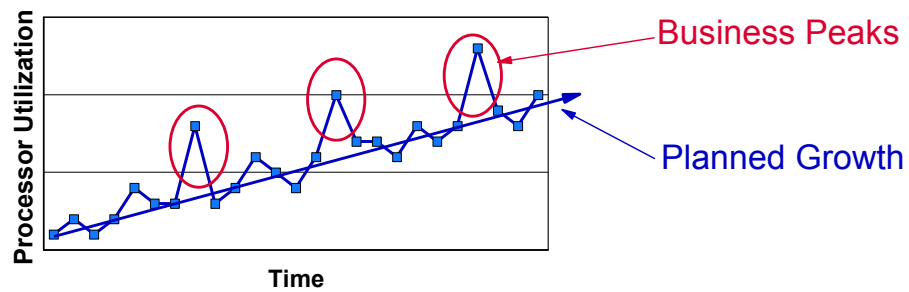
What's new in 2003

- CUoD and On/Off CoD are available on iSeries Model 825, 870, 890 (new processor features)
- On/Off CoD ... ability to temporarily activate processor capacity
- Low cost processor activations for Linux
- Simpler fulfillment process for permanent activations (no field VPD required)

With the introduction of the 2003 product line, iSeries once again will be among the leaders in this space by complementing the existing offering called CUoD with a brand new capability called On/Off CoD. On/Off CoD, means a customer, can turn processor capacity on/off to satisfy business peaks. You simply request a number of processors be temporarily made available for a specific number of days ... you will be billed for whatever you requested at the end of each calendar quarter. Like renting, this flexibility is more expensive in the long run than buying, the approximate break-even point is 45 Processor Days (if you request/pay for 45 Processor Days you will have paid approximately the same price you would have paid for permanently activating a processor).

An added benefit of the new function called On/Off CoD, are Bonus Processor Days. There is nothing else like it in the market today. With the initial order and fulfillment of a TCOE Enablement Feature (no charge feature) comes fourteen bonus days of temporary capacity ... you will not be billed for the first 14 days of temporary capacity you request from the server.

CUoD and On/Off CoD



- CUoD (Capacity Upgrade on Demand) for permanent capacity
 - Planned Growth ... pay when purchased, no premium
- On/Off CoD (Capacity on Demand) for temporary capacity
 - Business Peaks ... pay after use, break even is ~45 days
 - Special Purpose ... bonus and complementary days available

CUoD (aka. permanent capacity on demand)

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CUoD... Permanent Capacity

- Permanent capacity is offered on these combinations of Model/Processors

Model	Processor Feature	Startup Processors	Standby Processors	Installed Processors
825	2473	3	3	6
870	2486	8	8	16
890	2497	16	8	24
890	2498	24	8	32

- Standby processors can be permanently activated* by placing an order for a quantity of POD Activation Features. IBM will fulfill the order by generating a POD Activation Code.

Model	Processor Feature	POD Activation Feature	US Prices
825	2473	1609	\$??,000
870	2486	1611	\$??,000
890	2497	1612	\$??,000
890	2498	1613	\$??,000

* Additional operating system licensing is required if using an OS that is licensed by processor
* Additional software licensing is required if using SW that is licensed by processor


- The POD Activation Code will be mailed to you and also posted at this web site:

<http://www.ibm.com/eserver/series/hardware/ondemand>



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Permanent Capacity Pricing

IBM eServer iSeries


Permanent capacity pricing

It's very simple ... whether you purchase a POD Activation Feature to permanently activate a processor when the server is initially purchased or sometime later ... you pay the then current list price for the POD Activation Feature.

There are no pricing penalties or benefits either way.

Model	Processor Feature	Startup Processors	Standby Processors	POD Activation Feature	US List Prices
825	2473	3	3	1609	\$20,000
870	2486	8	8	1611	\$25,000
890	2497	16	8	1612	\$30,000
890	2498	24	8	1613	\$30,000

1. When a processor is permanently activated, additional operating system licensing is required if using an OS that is licensed by processor and/or additional software licensing is required if using SW that is licensed by processor
2. When an iSeries is purchased with an Enterprise Edition, a FC 9603 is included (activates a processor for Linux™ at no additional charge)

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Trial Capacity is not offered on new models

Pre-2003 hardware continues to offer trial capacity, a means of "trying" on demand capacity before permanently activating it. Trial capacity, allows you to temporarily activate 100% of your standby processors for a period of 14 elapsed days.

In 2003, the new models (i825, i870, and the new processors of the i890), will not have trial capacity. It has been replaced with Bonus Days (14 Processor Days of credit) that is available when/if a customer enables their machine for temporary capacity ... On/Off CoD.

Guidelines for Ordering a POD Activation Feature

Permanent Capacity can be activated by ordering POD Activation Features in any of the following order scenarios. Each scenario described below highlights the fact that it is now possible to order a POD Activation Feature along with new Box Orders, Upgrades, and Conversions .. this means you are no longer required to send CUoD Data (VPD) along with a POD Activation Feature order to have it fulfilled.

Guidelines for Ordering Permanent Capacity

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New Box Orders

=> The order for the new server can include new POD Activation Features, with the resulting POD Activation Code applied directly in manufacturing

Model-to-Model Upgrade (new footprint)

=> 100% activation of all standby processors is required on the old hardware prior to ordering a conversion/upgrade.
=> All records of POD Activation Features ordered prior to the conversion/upgrade are removed from the machine records (upgrade/conversion pricing takes into account the fact that 100% of the standby processors were previously activated)
=> The order for the upgrade can include new POD Activation Features, with the resulting POD Activation Code applied directly in manufacturing

Processor-to-Processor Conversion or Model-to-Model Upgrade (no new footprint)

=> 100% activation of all standby processors is required on the old hardware prior to ordering a conversion/upgrade.
=> All records of POD Activation Features ordered prior to the conversion/upgrade are removed from the machine records (upgrade/conversion pricing takes into account the fact that 100% of the standby processors were previously activated)



=> The order for the conversion/upgrade can include new POD Activation Features, with the resulting POD Activation Code mailed/posted without requiring CUoD Data (VPD) to be collected from the server and sent to IBM

Package-to-Package Conversion

=> All records of POD Activation Features ordered prior to the conversion remain on the machine records



=> The order for the conversion can include new POD Activation Features, with a resulting POD Activation Code that accounts for both old and new POD Activation Features being mailed/posted without requiring CUoD Data (VPD) to be collected from the server and sent to IBM

Activation Feature Orders

=> For orders that have POD Activation Features but don't contain a Processor or Package Feature .. if the Machine Serial# and/or the Capacity Card Serial# have not been altered outside of the IBM manufacturing or field maintenance process, then a POD Activation Code will be generated and mailed/posted without requiring CUoD Data (VPD) to be collected from the server and sent to IBM



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Ordering Permanent Capacity

Once you have determined that you want to permanently activate some or all of your standby processors, you must contact your IBM business partner, IBM Sales rep, or visit IBM.com (US only) to place an order for the purchase of a POD Activation Feature (one or more).

Once an order reaches the IBM manufacturing site, a POD Activation Code unique to the target server is generated, mailed, and posted at the following web-site for quick access:
<http://www.ibm.com/eserver/series/hardware/ondemand>

Several days should be allowed for order processing and the resulting POD Activation Code posting to take place. This is an important consideration when determining if you should also enable your server for temporary capacity.

Step-by-Step Instructions

Step1: Customer determines the number of stand-by processors they wish to activate

Step2: Customer contacts their Sales Channel (Distributor/Partner or IBM) or goes to IBM.com (US only) to place an order for a quantity of POD Activation Features

Step3: Sales Channel places an order in the IBM configurator for a specific quantity of POD Activation Features.

If the Machine Serial# and/or the Capacity Card Serial# have not been altered outside of the IBM manufacturing/field maintenance process ... then Skip to Step4

If the Machine Serial# and/or the Capacity Card Serial# have been altered outside of the IBM manufacturing/field maintenance process ... then do the following

- A) Sales Channel/Customer prints VPD from the server, by following these steps:
 - 1) Start System Service Tools (SST) with the STRSST command or start Dedicated Service Tools (DST) with Function 21 on the control panel (key in manual position)
 - 2) Sign on using service tools user profile of System capacity - administration
 - 3) Select the option to WORK WITH SYSTEM CAPACITY
 - 4) Select the option to DISPLAY SYSTEM CAPACITY INFORMATION
 - 5) Record information presented or enter F6 to print the information

- B) Sales Channel/Customer faxes VPD collected from the server to the following fax number:
Fax Number: 507-253-4553

COVER SHEET INFORMATION:

FAX To Information

Send To: Capacity On Demand Administrator (507-253-7019)
Fax Number: 507-253-4553
Location: Rochester, Minnesota

FAX From Information

Customer Name:
Customer Contact Name:
Customer Address:
Customer PHONE Number:
Customer FAX Number:

Step4: Customer retrieves the POD Activation Code from the web or waits for the POD Activation Code to be sent by mail. The POD Activation Code will be posted on the web usually within one business day of receiving the order on the manufacturing floor. To retrieve the POD Activation Code follow these steps:

- 1) Go to the following Web-site: <http://www.ibm.com/eserver/series/hardware/ondemand>
- 2) Enter the Machine Type and Serial number of the target server on the web page
- 3) Print and/or record the POD Activation Code displayed on the web page

Step5: Customer enters the POD Activation Code at the System Console for the target server:

- 1) Start System Service Tools (SST) with the STRSST command or start Dedicated Service Tools (DST) with Function 21 on the control panel (key in manual position)
- 2) Sign on using service tools user profile of System capacity - administration
- 3) Select the option to WORK WITH SYSTEM CAPACITY
- 4) Enter POD Activation Code and press Enter
- 5) Press Enter to confirm change and exit the System Capacity service function

Step6: Customer assigns the Activated Processors to a partition ... **you must do these steps even if your machine is not configured for LPAR!**

- A) Start the Work with system partitions option in DST or SST
- B) Enter Option 3 (Work with partition configuration)
- C) Enter Option 2 (Change partition processing resources) next to the PRIMARY
- D) Enter a value for "New number of processors" (The value should represent TOTAL active processors) ... press Enter

Note: *If a configuration error is signaled at the bottom of the screen, refer to LPAR trouble shooting article at*

<http://publib.boulder.ibm.com/series/v5r2/ic2924/info/rzaj8/rzaj8overview.htm>

- E) Press Enter to confirm the change
- F) Exit SST or DST

Important Considerations

If the server is in bypass mode for the System Password, DST option 12 may not be available (no access to the DST screens associated with the CUoD functionality). If this is the case, you should obtain a valid System Password by contacting your IBM business partner or IBM Sales rep.

After entering a POD Activation Code, the server must be run for 15 minutes to insure that the POD Activation Code is persistently stored (remembered) within the server. If you enter a POD Activation Code and shut down the server before it has run for 15 minutes, on your next IPL, the POD Activation Code **may be forgotten and may have to be re-entered**

Displaying Capacity Information

Information about how many standby processors are activated can be reviewed by using the following steps:

- 1) Start System Service Tools (SST) with the STRSST command or start Dedicated Service Tools (DST) with F21 on the control panel
- 2) Sign on using service tools user profile of System capacity - administration or System capacity - operator
- 3) Select the option to WORK WITH SYSTEM CAPACITY
- 4) Select the option to DISPLAY SYSTEM CAPACITY INFORMATION

Converting Features

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Converting Hardware Features

- A two step process is used to convert Model 825, 870, and 890 Processor Features
 - Step1: All standby processors must be activated
 - ▶ the possible paths for feature conversions will not be shown in the configurator until enough POD Activation Features have been ordered to activate 100% of the standby processors
 - ▶ The Processor Feature conversion price in Step2 will take into account the price paid for all standby processors to be activated in Step1
 - Step2: Processor Feature to Processor Feature Conversion
 - ▶ What happens to machine records
 - Old POD Activation Features will not be carried forward
 - Old TCOD Enablement Features will not be carried forward
 - Old TCOD Billing Features will be carried forward but no TCOD Data will remain on the server (customer is required, per contract, to report any temporary capacity activity prior to the conversion)

- A one step process is used to convert Model 825, 870, and 890 Package Features
 - Step1: Package Feature to Package Feature Conversion
 - ▶ What happens to machine records
 - Old POD Activation Features will be carried forward and a new Activation Code will be generated
 - Old TCOD Enablement Features will not be carried forward
 - Old TCOD Billing Features will be carried forward but no TCOD data will remain on the server (customer is required, per contract, to report any temporary capacity activity prior to the conversion)



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Cancellation of Orders

Once an Activation Code is posted/mailed, the order is considered fulfilled and the downstream billing process will be started. If a customer decides to cancel the order, after a Code is posted/mailed, IBM will dispatch an IBM service representative to the customer location to "invalidate" the posted/mailed Code by performing a maintenance action on the Capacity Card.

- 1) Original Capacity Card is replaced
- 2) Level II is contacted to generate refreshed Code(s) that will reset the server to the "entitled" levels of capacity
- 3) Original Capacity Card is returned to IBM and the machine is re-IPLed

Processor Failures

Standby processors **CAN** be used as REPLACEMENTS for failed processors (**Note: If the customer has activated all the standby processors, then obviously there aren't any to be used as spares**). Starting with V5R1, this capability is offered on iSeries servers with CUoD to help minimize the impact to server performance caused by a failed processor . **By re-IPLing the server after a processor fails** , the customer can re-establish required performance levels without waiting for parts to arrive on-site. If a stand-by processor is not currently activated, it will automatically be assigned as a REPLACEMENT processor and the customer can continue processing .

Moving Hardware

iSeries server to iSeries server interchange of processor and/or package features is iSeries system password protected. iSeries server to iSeries server interchange of processor and/or package features outside IBM standard practices and procedures, may void the server warranty or service contracts.

Any unauthorized (Non IBM conversion/upgrade) movement of processor features (processor parts) and/or package features (capacity card) will disable any previously activated/enabled standby processor capacity.

Any physical addition/removal of processor features (processor parts) and/or package features (capacity card) that results in an invalid configuration will make the server itself unusable (server will not IPL without a valid configuration).

Parts resulting from the fulfillment of an order for a processor conversion are directly tied to a target server (serial number), the parts are not transferable to a server with a different serial number. Installing the parts on a server with a different serial number is not supported by IBM.

Results of Moving iSeries Hardware

- Adding/Removing just the Processor Feature (**Processor Parts**)

A) Non-CUoD Models: Removing hardware from machine "A" and putting them into machine "B":

NOT POSSIBLE TO GET A VALID CONFIGURATION on MACHINE "A" WHEN ADDING ONLY PROCESSOR PARTS (machine will not IPL)

B) CUoD Models: Removing Hardware from machine "A" and putting them into machine "B":

NOT POSSIBLE TO GET A VALID CONFIGURATION on MACHINE "A" WHEN ADDING ONLY PROCESSOR PARTS (machine will not IPL)

- Adding/Removing just the Package Feature (**Capacity Card**) or

- Adding/Removing a Processor Feature (**Processor Parts**) with associated Package Feature (**Capacity Card**)

A) Non-CUoD Models: Removing hardware from machine "A" and putting it into machine "B":

1) If machine "B" ends up with a **valid** configuration and it's **original** serial number ...

then machine "B" will IPL with 100% of the installed processor capacity as well as 100% of the function associated with the Package Feature (Capacity Card)

NOTE: the machine will IPL in 70 day bypass mode and a new system password will be required (because the hardware changed)

2) If machine "B" ends up with an **invalid** configuration (not something that could be ordered in the iSeries configurator) ... **then machine "B" will not IPL**

B) CUoD Models: Removing hardware from machine "A" and putting it into machine "B":

1) If machine "B" ends up with a **valid** configuration and it's **original** serial number ...

then machine "B" will IPL with 100% of the start-up processor capacity, 0% of any previously activated standby processor capacity, and 100% of the function associated with the Package Feature (Capacity Card)

NOTE1: the machine will IPL in 70 day bypass mode and a new system password will be required (because the hardware changed)

NOTE2: To refresh previously purchased activations, a maintenance action would be required to replace the Capacity Card and receive a refreshed set of Activation Codes from IBM Level II (Activation Codes will not be provided if the Serial# of the Capacity Card being returned as part of maintenance action does not match the Capacity Card Serial# stored in the IBM machine records reviewed by Level II)

NOTE3: To purchase new activation/enablement features, a maintenance action would be required (if not done for NOTE 2) to replace the Capacity Card and then an order would have to be placed in the iSeries configurator for the proper features

2) If machine "B" ends up with an **invalid** configuration (not something that could be ordered in the iSeries configurator) ... **then machine "B" will not IPL**

- Exchanging an Entire Server

A) Non-CUoD Models: **Machine will IPL with 100% of installed processor capacity as well as 100% of the function associated with the Package Feature (Capacity Card)**

B) CUoD Models: **Machine will IPL with 100% of startup processor capacity, 100% of any previously activated standby processor capacity, and 100% of the function associated with the Processor Feature (Capacity Card)**

NOTE: To purchase new activation/enablement features, an order would be placed in the iSeries configurator

Logical Partitions

Starting with V5R1, every server has a primary partition (whether or not a customer is actively using logical partitions). As a result, it is necessary to assign any activated processors to the primary (or a secondary) partition to utilize the processors.

STEP1: Standby processors must be activated to become available to the server

STEP2: Activated processors must be assigned to a partition.

If your server is logically partitioned, refer to your logical partition plan and assign the newly activated processors accordingly.

If your server is not logically partitioned, perform the following steps (Service tools authority is required with operator authority to system partitions).

- A) Start the Work with system partitions option in DST or SST
- B) Enter Option 3 (Work with partition configuration)
- C) Enter Option 2 (Change partition processing resources) next to PRIMARY
- D) Enter a value for "New number of processors" (The value should represent TOTAL active processors) ... press Enter

Note: If a configuration error is signaled at the bottom of the screen, refer to LPAR trouble shooting article at

<http://publib.boulder.ibm.com/iserics/v5r2/ic2924/info/rzaj8/rzaj8overview.htm>

- E) Press Enter to confirm the change

SW Licenses

Activating a processor does not change the software tier for Model 825, 870, or 890.

Many partners use the Processor Feature Code value available on the server to set SW licensing fees for software developers software. This value continues to be available for all iSeries servers. It is important to understand that this value does not change, no matter how many standby processors get permanently or temporarily activated. The Processor Feature Code value (QPRCFEAT) can be displayed using the command WRKSYSVAL or retrieved using the RTVSYVAL command.

Software providers that charge SW licensing fees (ie. Operating Systems, middleware, applications, etc.) on a per processor basis, have historically utilized a "soft" compliance approach. With each permanent or temporary processor activation, it remains the customer's responsibility to inform and pay the required SW licensing fees associated with software that will be used on the activated processor(s).

Point1: When a permanent processor activation (POD Activation Feature) is ordered, any required charges for IBM software (licensed by processor), is automatically initiated via IBM configurator

Point2: When a temporary processor activation is requested on the server, any required charges for IBM software (licensed by processor), is the sole responsibility of the customer ... with the exception of OS/400 ... there are no additional OS/400 licensing charges associated with a temporary processor activation

The MATMATR Option OXO1F4 can be used to determine what capacity is active at any moment in time.

Permanent: Check the field at offset 0x38, to determine how many processors have been permanently activated (this field represents the quantity of permanently activated processors at any point in time)

Temporary: Check the field at offset 0x47, to determine how many processors have been temporarily activated (this field represents the quantity of temporarily activated processors at any point in time)

Performance Considerations

Standby processors are **NOT** considered within the various system functions that report CPU utilization percentages until they are activated and assigned to a partition.

CPU Utilization

CPU percent is a calculated metric based on the amount of time the processor was active within an elapsed time. This is normally reported as a percentage where 100% indicates the processor was busy for the entire sample interval. When multiple processors are present, CPU time must be adjusted to be the average usage of all processors so that utilization is always reported as the percentage of total available capacity.

Interactive capability is determined by the package feature purchased. This capability is not impacted by the number of standby processors and does not change when standby processors become active. Interactive utilization reported as a percentage of interactive capability is not affected by the Capacity Upgrade on Demand technology. Within Management Central, this metric is called “CPU Utilization (Interactive Feature)”.

Interactive CPU utilization is also reported as a percentage of total system CPU. Within Management Central this metric is called “CPU Utilization (Interactive Jobs)”.

Tools

There are several tools that can be used to help project which model/processor is appropriate for an initial installation and for projecting when standby processors should be activated. The Workload Estimator is typically used for sizing an initial installation. PATROL is a capacity planner that can often be used for both initial planning and upgrade planning. PM/400 is a trending tool that helps predict growth across workloads. Management Central is a monitoring tool that can be used to identify workload growth. In addition, IBM offers a variety of service options to assist with capacity planning tasks.

Workload Estimator

The Workload Estimator supports models with CUoD. However, only the performance capacity for startup processors will be represented. Capacity for standby processors **is not represented in the tool**. This tool is designed for initial sizing estimates and is not intended to achieve single-processor granularity with its estimates. When the Workload Estimator “recommends” a server as having sufficient capacity to contain a set of workloads, it includes a pull-down list of other supported servers that have at least the same capacity as the recommended server.

The Workload Estimator and associated on-line documentation can be found at:
<http://www.ibm.com/eserver/series/support/estimator>

PM/400

For more detailed information about PM/400e, visit their website at <http://www.ibm.com/eserver/series/pm400>

Management Central

Use of Management Central to aid in Capacity Planning and point out where an activation of standby processors should be considered can be illustrated in the following example:

Consider the model 840-2416 with eight startup processors and four standby processors. The maximum CPU utilization attainable would be 8/12 or approximately 67%. Typical thresholds for system CPU monitoring would be 70% and 90% of total capacity. Sustained usage above 70% is an indicator that additional capacity should be considered. Usage above 90% indicates the system is reaching its capacity maximum.

Applying the above thresholds to the Model 840 with one of these Processor Features (FC 2416, 2417, or 2419) would yield thresholds of 47% and 60% respectively. These values can be seen in the following Management Central Monitor example.

When the initial threshold is reached, assuming the tool has been set up correctly, the line graph goes red indicating that additional processors may be needed. In addition, a message can be triggered and logged when the thresholds are reached, so that an accounting can be done over time of how often the thresholds are crossed. If it reaches the final threshold value often, an upgrade should definitely be considered.

License, Warranty, Maintenance

License

BUILT-IN-CAPACITY

A machine may include computing resources or capabilities that are to remain inactive, or whose use is restricted, until the right to access and use the resources or capabilities is purchased (Built-in-Capacity). Examples of such computing resources and capabilities include but are not limited to processors, memory, storage, processing capacity identified as interactive processing capacity, and/or workload specific resources or capabilities (such as limitations on the use for a specific operating system, programming language or application). You are licensed to use the Program only to the extent of authorizations you have acquired for access to and use of Built-in-Capacity. You agree that if your use of Built-in-Capacity exceeds the authorizations you have acquired, you will be liable to IBM for the full price of permanent, unrestricted use of the Built-in-Capacity at IBM's current list price.

BUILT-IN-CAPACITY RESTRICTIONS

Built-in-Capacity is protected by certain technological measures. As a condition for your license to the Program under the Agreement, you may not circumvent such technological measures, or use a third party or third party product to do so, or otherwise access or use unauthorized Built-in-Capacity. In the event IBM determines that changes are necessary to the technological measures designed to limit access or use of Built-in-Capacity to that which has been purchased or otherwise authorized, IBM may provide you with changes to such technological measures. As a condition for your license to the Program hereunder, you agree, at IBM's option, to apply or allow IBM to apply such changes.

IBM SUPPLIED PROGRAM TEMPORARY FIXES (PTFs)

Application of PTFs may disable or render ineffective programs that use system memory addresses not generated by the IBM translator, including programs that circumvent control technology designed to limit interactive capacity to purchased levels. By applying PTFs you authorize and agree to the foregoing.

Warranty

Warranty for all processors (start-up and stand-by) begin when the server is installed. By having the Warranty/Service start immediately upon installation, the customer is better positioned to receive prompt service for the repair/replacement of any failing parts, ensuring the full complement of stand-by processors are available for immediate activation.

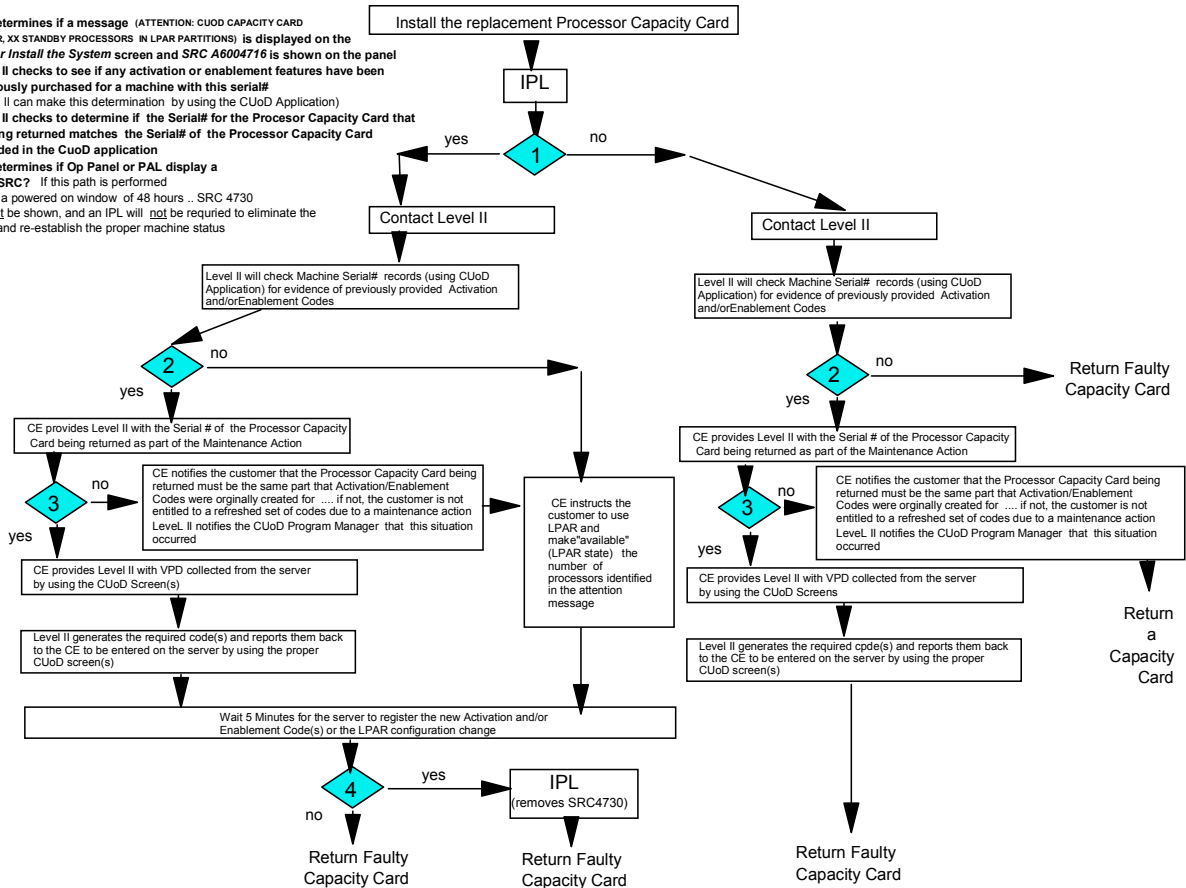
Maintenance

Maintenance agreement charges are based on the number of processors actually activated, maintenance prices will be adjusted for each processor activation, just like any other hardware feature add.

CE: Maintenance Instructions

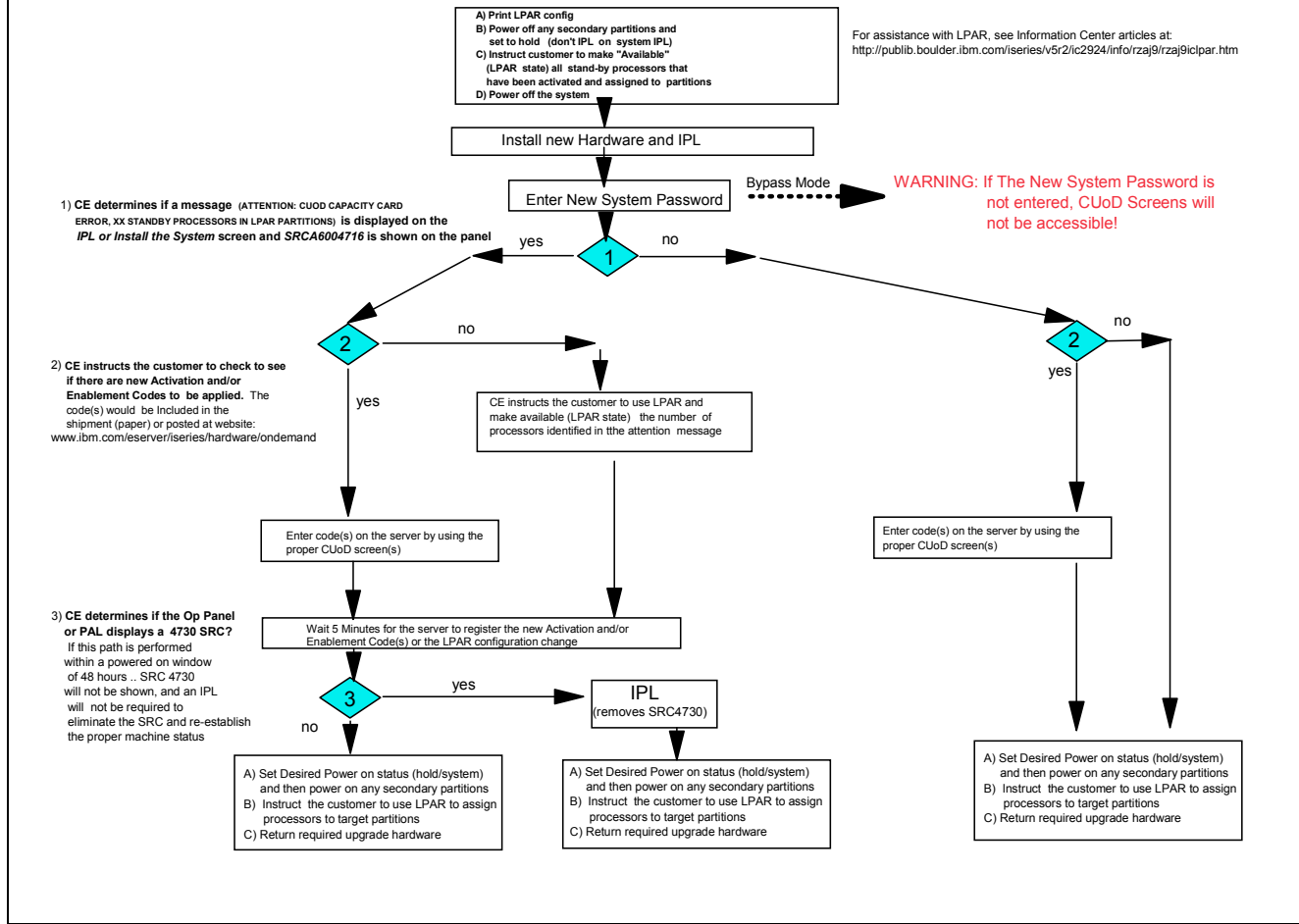
Model 825, 870, 890 (with V5R2) Maintenance Instructions

- 1) CE determines if a message (ATTENTION: CUOD CAPACITY CARD ERROR, XX STANDBY PROCESSORS IN LPAR PARTITIONS) is displayed on the IPL or Install the System screen and SRC A6004716 is shown on the panel
- 2) Level II checks to see if any activation or enablement features have been previously purchased for a machine with this serial# (Level II can make this determination by using the CUoD Application)
- 3) Level II checks to determine if the Serial# for the Processor Capacity Card that is being returned matches the Serial# of the Processor Capacity Card recorded in the CuoD application
- 4) CE determines if Op Panel or PAL display a 4730 SRC? If this path is performed within a powered on window of 48 hours, SRC 4730 will not be shown, and an IPL will not be required to eliminate the SRC and re-establish the proper machine status



CE: Conversion Instructions

Model 825, 870, and 890 (with V5R2) Processor or Package Feature Conversion Instructions



CE: Upgrade Instructions

Model 825, 870, 8909 (with V5R2) Model to Model Upgrade Instructions

1) CE determines if the Op Panel or PAL displays a 4730 SRC? If this path is performed within a powered on window of 48 hours, SRC 4730 will not be shown, and an IPL will not be required to eliminate the SRC and re-establish the proper machine status

