iSeries
Model 830, 840, and 890

V5R1/V5R2 Planning Guide for Capacity Upgrade On Demand

Jan 1, 2003

IMPORTANT IMPORTANT IMPORTANT ... Returning Trial Capacity

Trial Capacity **MUST** be made "available" to be re-claimed:

    1) Customer makes the Trial Capacity (temp orary processors) available to be re-claimed by the server **before** the Trial Capacity Period expires

  OR 2) Customer makes the Trial Capacity (temp orary processors) available to be re-claimed by the server **before** any processors are permanently activated (POD Activation Code is entered)

Anytime prior to the end of the 14 day trial capacity period, the Trial Capacity (temporary processors) can be removed from partition(s) and made available to be re-claimed by the server. **If the proper number of processors are not made available to be re-claimed prior to the 14 day Trial Capacity Period expiring, the server may experience degraded performance (SRC A6004730 will be displayed on the operator panel)**

IMPORTANT: If SRC A6004730 is displayed on the operator panel:
    Step1: Remove all Trial Capacity (temporary processors) from the partition(s) and make them "Available" (LPAR state) to be re-claimed by the server (for assistance see LPAR documentation)
    Step2: Perform an IPL

Preface

IBM is delivering a fast, non-disruptive method of activating "extra" processor capacity ...built directly
into IBM eServers.   You can activate additional processors and pay for the new processing power
as your needs grow ... **Capacity Upgrade on Demand**.

Your new e-business application on the Web...it's dynamite, and it's getting the traffic that you hoped for. Your
server has a reserve of stand-by power to handle all the hits. Or picture this. You've told your business analysts
that they now have access to all the company's business intelligence data. They're ecstatic. Response time could
slow to a crawl in the present configuration. You knew you might need processing power to meet demands of your
success and you didn't want to disrupt current operations when you wanted more horsepower. How did you do this?
The answer is simple. You used the **Capacity Upgrade on Demand** capability offered on the **IBM eServer iSeries.**
It enabled you to start small, then increase processing capacity without disrupting any of your current operations.

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** (CUoD). CUoD is available on a Model 830,840 and 890.

This guide is not a capacity planning document ... it will however point out key considerations when using capacity
planning tools for a Model 830, 840, and 890.

Where to Get Help

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

 Problem with collecting/transmitting required VPD Data

   => **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 Processor 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 (A new POD Activation Code must be generated and applied)

 Problem with understanding technical details of Capacity Upgrade on Demand

   => Review appropriate sections in this Planning Guide

   => Work with Level II support in your geography

 Problem with selling/marketing Capacity Upgrade on Demand

   => Review appropriate sections in this Planning Guide

   => Work with account teams 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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Capacity Upgrade on Demand

iSeries Capacity Upgrade on Demand offers the capability to non-disruptively activate one or more processors of a Model 830, 840, or 890. Capacity Upgrade on Demand adds capacity in increments of one processor, up to the maximum number of stand-by processors. Capacity Upgrade on Demand has significant value for installations who want to upgrade without disruption , handle business peaks, and/or add new workloads.

Capacity Upgrade on Demand provides **trial** and **permanent** capacity growth with no requirement to IPL the server.

What's new in 2002

- ✍ Two new Model 890 processor features offering CUoD (2487, 2488) ... **requires V5R2**
- ✍ One new Model 830 processor feature offering CUoD (2349) ... V5R1 or V5R2
- ✍ Elimination of the premium pricing once associated with CUoD (Most countries where iSeries is sold)
- ✍ Capability to order POD Activation Features on a new order or model upgrade (new footprint) and have the POD Activation Code (Capacity Key) generated and applied directly in manufacturing

Processor Features

Processor features for the Model 830, 840, and 890 each come with a set of **start-up** processors that are "active" and a set of **stand-by** processors that are "not active".

In 2002, three new Processor Features with CUoD are now available -- **830-2349, 890-2487, 840-2488.**

	START-UP Processors ("Active")	STAND-BY Processors	TOTAL Processors
830-2349	4	4	8
830-2351	1	7	8
840-2352	8	4	12
840-2353	12	6	18
840-2354	18	6	24
890-2487	16	8	24
890-2488	24	8	32

POD Activation Features

Stand-by processors (one or more) can be permanently activated by ordering a quantity of POD Activation Features (ie. **1610** for the Model 890, **1604** for the Model 840, and **1605** for the Model 830).

POD Activation Code (Capacity Key)

An order for a quantity of POD Activation Features will be fulfilled by the generation, shipping, and web posting of a POD Activation Code (think of it as a Capacity key).

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 offering CUoD, 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 stand-by 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 help ensure they get the full benefit of processor activations.

Capacity Planning Services

A customer may consider the following service providers to assist them with their capacity planning needs.

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

Trial Capacity

Trial Capacity can provide iSeries customers with an opportunity to evaluate the use of temporarily activated stand-by processors. Trial Capacity is available for a "one-time" use after the initial IPL **and** also for a "one-time" use each time a POD Activation Code is entered.

Prior to using Trial Capacity, there are a few important considerations.

When To Use It

Consideration 1:
Once started, Trial Capacity is available for 14 elapsed (power-on) days. It is not possible to stop and re-start Trial Capacity. The elapsed clock ticks while the server is turned on.

Consideration 2:
All processors (start-up + stand-by) are active when Trial Capacity has been started.

Consideration 3:
A POD Activation Code resulting from the order of POD Activation Features will be posted at a website usually within one business day (24 hours), provided the order is **accompanied** with required VPD data (collected from the server). However, IBM cannot control the amount of time it takes for a customer to work with his/her partner to place an order. By leveraging a portion of the 14 days available with Trial Capacity, one can buffer any order fulfillment delays and insure he/she does not experience a shortage of capacity while waiting for the posting/mailing of an Activation Code.

Consideration 4:
Starting with V5R1, every server has a primary partition (whether or not a customer is actively using logical partitioning). As a result, it is necessary to assign any termporarily activated processors to the primary (or a secondary) partition to utilize the processors.

Consideration 5:
Anytime prior to the end of the 14 day trial capacity period, the Trial Capacity (temporary processors) can be removed from partition(s) and made available to be re-claimed by the server. **If the proper number of processors are not made available to be re-claimed prior to the 14 day Trial Capacity Period expiring, the server may experience degraded performance (SRC A6004730 will be displayed on the operator panel)**

IMPORTANT: When SRC A6004730 is displayed on the operator panel:
Step1: Remove all Trial Capacity (temporary processors) from the partition(s) and make them "available"
(LPAR state) to be re-claimed by the server (for assistance see LPAR documentation)
Step2: Perform an IPL

Turning It On

Do the following from a System Console (no need for a dedicated system, no IPL required, and no need to end jobs and/or user activity).

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 START TEMPORARY SYSTEM CAPACITY ACTIVATION
    (not shown if currently in-use or has already been used)
5) Press Enter to confirm change
6) Exit the System Capacity service function
7) Assign the Activated Processors to a partition (Steps A thru F) ... **you must do this step even if your machine is not configured for LPAR!**
    A) Start the Work With System Partitions option in DSTor 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, it means that the default Primary partition has been altered (logical partitioning is actively being used) and it is necessary to refer to your logical partition plan to properly assign the activated processors to the server.*
    E) Press Enter to confirm the change
    F) Exit SST or DST
8) Begin using the new capacity

Returning Trial Capacity

Trial Capacity must be made "available" to be re-claimed in one of the following ways:

1) Customer makes the Trial Capacity (temporary processors) available to be re-claimed by the server **before** the Trial Capacity Period expires
        For Example:
            DAY 1: Turn on trial capacity for a 4/8 way machine , as a result, 4 processors are put into the server resource pool (available status)
                    The 4 processors are then assigned to secondary partitions for use
            DAY14: Take 4 processors of trial capacity out of the secondary partitions and put them back into the server resource pool (available status)
                    Server code re-claims the 4 processors from the server resource pool, as a result no SRC/no perrformance penalties

2) Customer makes the Trial Capacity (temporary processors) available to be re-claimed by the server **before** processors are permanently activated (POD Activation Code is entered)
        For Example:
            DAY 1: Turn on trial capacity for a 4/8 way machine , as a result, 4 processors are put into the server resource pool (available status)
                    The 4 processors are then assigned to secondary partitions for use
            DAY10: Take 1 processor of trial capacity out of the secondary partitions and put it back into the server resource

pool (available status)
DAY12: Enter a POD Activation Code to turn on three permanent processors and the Trial Capacity Period ends
Server code re-claims the 1 processor from the server resource pool, as a result no SRC/no perrformance
penalties!

Anytime prior to the end of the 14 day trial capacity period, the Trial Capacity (temporary processors) can be removed from partition(s) and made available to be re-claimed by the server. **If the proper number of processors are not made available to be re-claimed prior to the 14 day Trial Capacity Period expiring, the server may experience degraded performance (SRC A6004730 will be displayed on the operator panel)**

 IMPORTANT: When SRC A6004730 is displayed on the operator panel:
    Step1: Remove all Trial Capacity (temporary processors) from the partition(s) and make them "available"
         (LPAR state) to be re-claimed by the server (for assistance see LPAR documentation)
    Step2: Perform an IPL

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Permanent Capacity

Permanent Capacity can be activated in any of the following four scenarios. **Each scenario described below highlights if and when it is necessary to send VPD data to IBM.**

Box Order for a New Server (New Footprint)
- ✍Order <u>can</u> contain a quantity of POD Activation Features
- ✍Order for POD Activation Features is fufilled in manufacturing by collecting VPD data and entering the POD Activation Code directly in the plant of manufacture, before the machine ever ships

Manufactured MES Order for a Model to Model Upgrade (Upgrade Footprint)
- ✍Order <u>can</u> contain a quantity of POD Activation Features
- ✍Order for POD Activation Features is fufilled in manufacturing by collecting VPD data and entering the POD Activation Code directly in the plant of manufacture, before the machine ever ships

Manufactured MES or Loose Parts MES Order for a Processor Feature (Processor Card)
- ✍Order <u>cannot</u> contain a **quantity of POD Activation Features**
- ✍Order <u>cannot</u> be placed unless **100% of the stand-by processors have been activated**

Manufactured MES or Loose Parts MES Order for a POD Activation Feature (POD Activation Code)
- ✍Order <u>cannot</u> contain **a Processor Feature**
- ✍Order <u>cannot</u> be fulfilled unitl **VPD data is reported from the currently installed server** and sent (manual or electronic) to the CUoD Administrator
- ✍Order <u>cannot</u> be fufilled any faster than the **date scheduled for the longest lead-time part** on the order

Ordering POD Activation Features for an Installed Server

Once you have determined that you want to permanently activate some or all of your stand-by 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). When the order record and the VPD data are both available to IBM manufacturing, a POD Activation Code unique to the target server is generated, mailed, and posted at a public web-site for quick access: http://www.ibm.com/eserver/iseries/hardware/ondemand

As part of the order process, vital product data (VPD) collected from the installed server is combined with information from the actual order records for POD Activation Features. This combined information will be used in the generation of a POD Activation Code that will work specifically for the targeted server, enabling the activation of the desired number of stand-by processors

Several days should be allowed for the order processing and POD Activation Code posting to take place. This is an important consideration when deciding to use your Trial Capacity

Step-by-Step Instructions

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

Step2: Customer contacts their sales rep (Partners or IBM) or goes to IBM.com (US only)
      to place an order for a quantity of POD Activation Features

Step3: Sales rep places an order in IBM configurators for a specific quantity of POD Activation Features. The Sales Rep is provided with a reminder (via configurator) that **Vital Product Data from the iSeries server must (Electronic or Manual) be sent to IBM to fulfill the order.**

        Electronic Process (Electronic Service Agent)
          Excercise the steps found in Chapter 2 of the IBM Electronic Service Agent for ISeries Simplified Activation User Guide -- Release V5R2, found at URL:
            http://publib.boulder.ibm.com/as400_sd/sdsadoc.html

        Manual Process (FAX):
         A) Customer prints Vital Product Data 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) Customer faxes Vital Product Data collected from the server to the following fax number:
           Fax Number: 507-253-4553

          COVER SHEET INFORMATION:
           <u>**FAX To Information**</u>
             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 if the VPD data has already been sent. To retrieve
          the POD Activation Code follow these steps:
         1) Go to the following Web-site: http: //www.ibm.com/ eserver/iseries/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:Assign the Activated Processors to a partition (Steps A thru F) ... **you must do this step 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, it means that the
                        default Primary partition has been altered (logical partitioning is actively being used)
                        and it is necessary to refer to your logical partition plan to properly assign the
                        activated processors to the server.*
           E) Press Enter to confirm the change
           F)Exit SST or DST

 Step 7) Begin using the new capacity

Important Considerations when entering a POD Activation Code

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 you IBM business partner or IBM Sales rep.

When you enter a POD Activation Code, stand-by processors will immediately become active. 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**

Electronic Service Agent: Reporting VPD Information

Starting with V5R1, Electronic Service Agent support can be used to "electronically" transfer VPD information to IBM. **When Electronic Service Agent is used to electronically report VPD data on a regular basis, one can eliminate potential delays in the order process for POD Activation Features (no manual reporting of VPD data is required.**

Excercise the steps found in Chapter 2 of the IBM Electronic Service Agent for ISeries Simplified Activation User Guide -- Release V5R2, found at URL:

http://publib.boulder.ibm.com/as400_sd/sdsadoc.html

Displaying Processor Capacity Information

Information about how many stand-by 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

Cancellation of Orders Containing POD Activation Features

Once the Activation Code is posted/mailed, the order for POD Activation Features is considered fulfilled and the downstream billing process will be started. If a customer decides to cancel and/or return the order for POD Activation Features after an Activation Code is posted, IBM will dispatch an IBM service representative to the customer location to "invalidate" the delivered Activation Code.

If the IBM service representative determines the posted/mailed Activation Code **has not been used,** then the IBM service representative will request a "re-set" Activation Code (represents proper number of active processors) from Level II in Rochester and then enter it via DST/SST screens at the server console.

If the IBM service representative determines the posted/mailed Activation Code **has been used,** then, the IBM service representative replaces the Processor Capacity Card on the server (will require IPL) and then requests a "re-set" Activation Code (represents proper number of active processors) from Level II in Rochester and then enters it via DST/SST screens at the server console.

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 .

Important Considerations

Point1: Trial Activation (the 14-day free use of all standby processors) affects CPU sparing since
     during the Trial Activation period there are no standby processors available (all are activated).
Point2: A standby processor used as a spare does not subtract any time from the Trial Activation 14-day period
Point3: The customer can select to use Trial Capacity during the time a procesor(s) has failed, but any failed
     processors will not be usable and should be repaired at the customer's earliest convenience.

Movement of Processor Features

iSeries server to iSeries server interchange of processor or interactive features is iSeries system password protected. iSeries server to iSeries server interchange of processor or interactive features outside IBM standard practices and procedures, may void 8XX server warranty or service contracts.

Any unauthorized (Non IBM upgrades) movement of processor hardware will disable the capability to use stand-by processors.

Any physical removal of processor hardware will make the server itself unuseable (All start-up and stand-by processors must be available in the server to IPL)

Logical Partitions -- What You Need to Know

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: Stand-by processors must be <u>activated</u> to become available to the server

  STEP2: Activated processors must be <u>assigned</u> 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 <u>not</u> 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, it means that the*
                    default Primary partition has been altered (logical partitioning is actively being used)
                    and it is necessary to refer to your logical partition plan to properly assign the
                    activated processors to the server.
        E) Press Enter to confirm the change

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NOTE: Anytime prior to the end of the 14 day trial capacity period, the Trial Capacity (temporary processors) can be removed from partition(s) and made available to be re-claimed by the server. **If the proper number of processors are not made available to be re-claimed prior to the 14 day Trial Capacity Period expiring, the server may experience degraded performance (SRC A6004730 will be displayed on the operator panel)**

  IMPORTANT: When SRC A6004730 is displayed on the operator panel:
     Step1: Remove all Trial Capacity (temporary processors) from the partition(s) and make them "available"
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     Step2: Perform an IPL

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SW Licenses -- What You Need to Know

Activating a processor does not change the software tier for Model 830-2349, Model 830-2351 (adding a optional interactive feature will raise the software tier from P30 to P40).

Activating a processor does not change the software tier for Model 840-2352, Model 840-2353, or Model 840-2354 (adding a optional interactive feature will raise the software tier from P40 to P50).

Activating a processor does not change the software tier for Model 890-2487, Model 890-2488 (adding a optional interactive feature will raise the software tier from P50 to P60).

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 on servers using POD Processor Features, but it should be noted that the Processor Feature Code value remains the same, no matter how many stand-by processors are activated. The Processor Feature Code value (QPRCFEAT) can be displayed using the command WRKSYSVAL or retrieved using the RTVSYSVAL command.

Software providers that base their SW licensing fees on the number of processors on a server have historically utilized a "soft" compliance approach. With each processor activation, it remains the customer's responsibility to inform and pay the required SW licensing fees associated with any software resident on the server that has software licensed by the number of processors.

> Note: *When a POD Activation Feature is ordered via one of the IBM configurators, additional charges for IBM SW licensing is initiated for software products currently installed on the customer's server that are licensed by processor.*

V5R1/V5R2 Performance Considerations

Stand-by processors are **NOT** considered "active" within the various system functions that report CPU utilization percentages.

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 CPU Utilization

Interactive capability is determined by the interactive feature purchased. This capability is not impacted by the number of stand-by processors and does not change when stand-by 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)". This metric is impacted on servers with CUoD in the same manner as described above for system CPU utilization.

CPU Utilization within Logical Partitions

Within an LPARed server, stand-by processors (not in an "active" status) are always associated with the primary partition.

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 stand-by processors should be activated. The Workload Estimator is typically used for sizing an initial installation. BEST/1 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 start-up processors will be represented. Capacity for stand-by 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/iseries/support/estimator

PM/400

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

Management Central

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

Consider the model 840-2416 with eight start-up processors and four stand-by 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 POD 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.
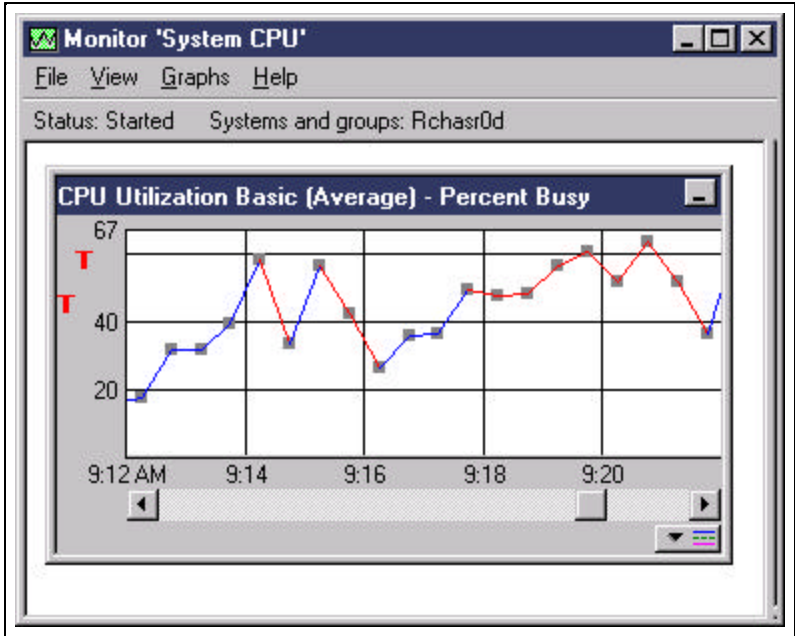
License, Warranty, Maintenance Information

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.

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IBM SUPPLIED PROGRAM TEMPORARY FIXES (PTFs)

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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.

Model Performance Tables

Relative performance measurements are derived from commercial processing workloads (CPW) running on iSeries servers. CPW is representative of commercial applications, particularly those that do significant database processing in conjunction with journaling and committment control. CPW values may not be realized in all environments.

IBM will publish the Processor CPW value for the start-up number of processors as well as a Processor CPW value that represents the full capacity of the server when all processors are active (Start-up + Stand-by).   IBM is not publishing Processor CPW values associated with each incremental processor activation. If needed, for capacity planning purposes, one could calculate the approximate CPW associated with each activated processor by subtracting the Processor CPW published for the start-up number of processors from the maximum Processor CPW for the server and then dividing by the number of stand-by processors.

Model 830

Interactive Features are available for on all processors with CUoD. Interactive performance is limited by the total capacity of active processors.

Processor Feature	Processor CPW	Interactive Feature	Interactive CPW
#2349	4200/7350	#1531 (Default)	70
		#1532	120
		#1533	240
		#1534	560
		#1535	1050
		#1536	2000
		#1537	4550
#2351	1200/7350	#1531 (Default)	70
		#1532	120
		#1533	240
		#1534	560
		#1535	1050
		#1536	2000
		#1537	4550

Model 840

Interactive Features are available for on all processors with CUoD. Interactive performance is limited by the total capacity of active processors.

Processor Feature	Processor CPW	Interactive Feature	Interactive CPW
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#2352	9000/12000	#1540 (Default)	120
		#1541	240
		#1542	560
		#1543	1050
		#1544	2000
		#1545	4550
		#1546	10000
#2353	12000/16500	#1540 (Default)	120
		#1541	240
		#1542	560
		#1543	1050
		#1544	2000
		#1545	4550
		#1546	10000
		#1547	16500
#2354	16500/20200	#1540 (Default)	120
		#1541	240
		#1542	560
		#1543	1050
		#1544	2000
		#1545	4550
		#1546	10000
		#1547	16500
		#1548	20200

Model 890

Interactive Features are available for on all processors with CUoD. Interactive performance is limited by the total capacity of active processors.

Processor Feature	Processor CPW	Interactive Feature	Interactive CPW
#2487	20000/29300	#1576(Default)	120
		#1577	240
		#1578	560
		#1579	1050
		#1581	2000
		#1583	4550
		#1585	10000
		#1587	16500
		#1588	20200
#2488	29300/37400	#1576 (Default)	120
		#1577	240
		#1578	560
		#1579	1050
		#1581	2000
		#1583	4550
		#1585	10000
		#1587	16500
		#1588	20200
		#1591	37400

Two Steps Required to Convert Processor Features

A two step process is used to convert Processor Features with stand-by capacity

The conversion price for Step2 will take into account the price paid for all stand-by processors activated in Step1

Step1: **All** stand-by processors must be activated

Step2: Processor Feature to Processor Feature Conversion

✍Server records reflect new Processor Feature

✍No POD Activation Features are carried forward

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

Processor Feature Conversions into Model 830

One Step

720-2063 to 830-2349 (4/8)
720-2064 to 830-2349 (4/8)
730-2065 to 830-2349 (4/8)
730-2066 to 830-2349 (4/8)
730-2067 to 830-2349 (4/8)
730-2068 to 830-2349 (4/8)
740-2069 to 830-2349 (4/8)
740-2070 to 830-2349 (4/8)
820-2396 to 830-2349 (4/8)
820-2397 to 830-2349 (4/8)
820-2398 to 830-2349 (4/8)
820-2435 to 830-2349 (4/8)
820-2436 to 830-2349 (4/8)
820-2437 to 830-2349 (4/8)
820-2438 to 830-2349 (4/8)
830-2400 to 830-2349 (4/8)
830-2402 to 830-2349 (4/8)

Processor Feature Conversions into Model 840

One Step

    730-2067 to 840-2352 (8/12) or 840-2353 (12/18)
    730-2068 to 840-2352 (8/12) or 840-2353 (12/18) or 840-2354 (18/24)
    740-2069 to 840-2352 (8/12) or 840-2353 (12/18) or 840-2354 (18/24)
    740-2070 to 840-2352 (8/12) or 840-2353 (12/18) or 840-2354 (18/24)
    820-2397 to 840-2352 (8/12) or 840-2353 (12/18)
    820-2437 to 840-2352 (8/12) or 840-2353 (12/18)
    820-2398 to 840-2352 (8/12) or 840-2353 (12/18) or 840-2354 (18/24)
    820-2438 to 840-2352 (8/12) or 840-2353 (12/18) or 840-2354 (18/24)
    830-2400 to 840-2352 (8/12) or 840-2353 (12/18) or 840-2354 (18/24)
    830-2402 to 840-2352 (8/12) or 840-2353 (12/18) or 840-2354 (18/24)
    830-2403 to 840-2352 (8/12) or 840-2353 (12/18) or 840-2354 (18/24)
    840-2418 to .... 840-2353 (12/18) or 840-2354 (18/24)
    840-2420 to 840-2354 (18/24)

Two Step

    1st Step: All stand-by processors must be activated before proceeding with conversion
    2nd Step:
    830-2349 (8/8)   to 840-2352 (8/12) or 840-2353 (12/18) or 840-2354 (18/24)
    840-2416 (12/12) to .... 840-2353 (12/18) or 840-2354 (18/24)
    840-2417 (18/18) to 840-2354 (18/24)
    840-2419 (24/24) to 840-2354 (18/24)
    840-2352 (12/12) to .... 840-2353 (12/18) or 840-2354 (18/24)
    840-2353 (18/18) to 840-2354 (18/24)

Processor Feature Conversions into Model 890

One Step

        740-2069 to 890-2487 (16/24)
        740-2070 to 890-2487 (16/24)
        830-2402 to 890-2487 (16/24)
        830-2403 to 890-2487 (16/24)
        830-2461 to 890-2488 (24/32)
        840-2418 to 890-2487 (16/24)
        840-2420 to 890-2487 (16/24)

Two Step

        1st Step: All stand-by processors must be activated before proceeding with conversion
        2nd Step:
        830-2349 (8/8)   to 890-2487 (16/24)
        840-2416 (12/12) to 890-2487 (16/24)
        840-2417 (18/18) to 890-2487 (16/24)
        840-2419 (24/24) to 890-2487 (16/24)
        840-2352 (12/12) to 890-2487 (16/24)
        840-2353 (18/18) to 890-2487 (16/24)
        840-2354 (24/24) to 890-2487 (16/24) or 890-2488 (24/32)

        890-2487 (24/24) to 890-2488 (24/32)

Question and Answers

1) What is Capacity Upgrade on Demand?

ANSWER: IBM offers a fast, non-disruptive method of activating "extra" processor capacity ... built directly into IBM eServers.   You can activate additional processors and pay only for the new processing power as your needs grow ... Capacity Upgrade on Demand.

2) How does Capacity Upgrade on Demand work for iSeries 890?

ANSWER: Model 890 processor features 2487 and 2488 come with a number of **Start-up** processors that are in an "active" status and a set of **stand-by** processors that can be activated at a later time. Customers don't pay for the extra capacity until they need it.

3) Can I turn off a processor after it has been permanently activated?

ANSWER: iSeries Capacity Upgrade on Demand represents a "permanent" activation. When a POD Activation Feature is ordered and the resulting POD Activation Code is entered at the server console, the capacity that is activated is permanent and cannot be turned off.

4) What degree of granularity do I have when activating additional capacity?

ANSWER: The number of stand-by processors offered on the various iSeries Models varies from four on the Model 830 to eight on the Model 890.

5) Do I have to pay for Processor Capacity I never use?

ANSWER: No, you never have to activate the stand-by processors.

Note: If you ever decide to do a processor feature conversion it will be necessary to first fully activate all of our stand-by processors. This is only for logistic purposes and IBM gives you full credit for all purchased activations when it sets the price for the processor feature conversion

6) Can Trial Capacity be turned on and off multiple times?

ANSWER: Trial Capacity was designed to provide our customers with an opportunity to evaluate the use of stand-by capacity. Once started, Trial Capacity is available for 14 elapsed days. It is not possible to stop and re-start Trial Capacity. The elapsed clock ticks while the server is turned on.

7) Are the POD Activation Codes secure?

ANSWER: A Processor Capacity Card helps to enable the secure management of hardware assets for iSeries servers. We first used this type of technology with the introduction of the Interactive Features back in February 1999. We are using similar technology (Processor

Capacity Card) to manage the available processor capacity of your server .

8) *Are the POD Activation Codes unique to a specific server?*
   ANSWER: A POD Activation Code will only work for the Processor Capacity Card and machine serial number that was designated during the order process. The POD Activation Code cannot be utilized on an alternate machine either by entering the POD Activation Code on another machine or by physically moving the Processor Capacity Card.

9) *On which iSeries model(s) is Capacity Upgrade on Demand available?*
   ANSWER: iSeries Capacity Upgrade on Demand offers the capability to non-disruptively activate one or more central processors of a Model 830, 840 and 890. Capacity Upgrade on Demand adds capacity in increments of one processor, up to the maximum number of stand-by processors built into the Model 830, 840, and 890.

10) *Can I upgrade my existing AS/400e server into an iSeries model with CUoD?*
   ANSWER: Yes, upgrades from Models 720, 730, and 740 are offered.

11) *Where are the order and fulfillment processes documented for iSeries CUoD?*
   ANSWER: Past and present RFAs contain the basic information you need to place orders for new hardware features. Complementary details associated with the ordering and fulfillment of the hardware features with CUoD can be found in the **iSeries CUoD Planning Guide** located at http://www.ibm.com/eserver/iseries/hardware/ondemand

12) *What channel(s) can be used to order Processor Features and/or POD Activation Features?*
   ANSWER: A customer can work with sales representatives (IBM Business Partners or IBM) to place orders for hardware features on any/all iSeries models. In the 2nd Qtr (US only) IBM.com will be an alternative place to order POD Activation Features.

13) *Can Business Partners issue POD Activation Codes?*
   ANSWER: No. As part of the WW order process, vital product data (VPD) is collected from the server (manual or electronic) and combined with information from the order of POD Activation Features.
   This combined information is used by IBM manufacturing in the generation of a POD Activation Code that will work specifically for the targeted server, enabling the activation of the desired number of stand-by processors.

14) *Are there special terms and conditions I should be aware of when purchasing an iSeries With CUoD?*
   ANSWER: *Yes.*

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15) Are there any implications if I sell my iSeries and I haven't activated all of the stand-by processors?

   ANSWER: An iSeries with any processor feature can be sold as is. That means the new owner can activate any remaining stand-by processors by placing an order with their sales rep for one or more POD Activation Features.

16) If a customer permanently activates some or all of the stand-by processors, how does that impact software licensing?

   ANSWER: Activating a processor does not change the software tier for Model 830-2349, Model 830-2351 (adding a optional interactive feature will raise the software tier from P30 to P40).

   Activating a processor does not change the software tier for Model 840-2352, Model 840-2353, or Model 840-2354 (adding a optional interactive feature will raise the software tier from P40 to P50).

   Activating a processor does not change the software tier for Model 890-2487, Model 890-2488 (adding a optional interactive feature will raise the software tier from P50 to P60).

17) How is billing triggered after the customer requests an order be placed for a POD

Activation Feature to turn on more processor capacity?

ANSWER: Once the customer has determined that they want to permanently activate some or all of their stand-by processors, they must contact their a sales rep from an IBM Business Partner, IBM rep, or IBM.com to place an order for the purchase of one or more POD Activation Features. Once an order reaches the IBM manufacturing site, a POD Activation Code unique to the target server is generated and posted at a public web-site for quick access. There is nothing new and/or unique about the billing process for POD Activation Features... billing activity starts after the hardware feature is shipped .. the actual "shipment" from manufacturing that starts the downstream billing process is a sheet of paper that contains the POD Activation Code.

18) *How do the Performance Tools react when Trial Capacity is used on a LPAR machine?*

ANSWER: When Trial Capacity is used, all the stand-by processors are made available to LPAR. Once the available processors are configured into a partition, they will be handled by the system/performance tools like any other processor. If they are not configured into a partition, they will not influence the performance reports for that partition.

For instance, if an 8/12 way has 4 stand-by processors (not activated and not available for assignment to a partition), 1 processor activated but not assigned to a partition, 1 processor assigned to the **primary** partition, 2 processors assigned to a secondary partition, and 4 processors assigned to another **secondary** partition. If one processor's worth of work is being done in each partition, the performance tools will show that the **primary** partition is 100% utilized, the first **secondary** partition is 50% utilized, and the second **secondary** partition is 25% utilized.

When Trial Capacity is used, let's say the 8/12 way now has 2 processors activated but not assigned to a partition, 2 processors assigned to the **primary** partition, 3 processors assigned to a secondary partition, and 5 processors assigned to another **secondary** partition. If one processor's worth of work is still being done in each partition, the performance tools will show that the **primary** partition is 50% utilized, the first **secondary** partition is 33% utilized, and the second **secondary** partition is 20% utilized

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