IBM Passport Advantage Software

Sub-capacity (Virtualization) License Counting Rules

Using Operating System (OS) Commands and BIOS Settings on x86 servers to Limit Processor Cores Available

NOTE: Please use these rules along with the Sub-capacity licensing attachment

October 23, 2013

..

Index

- Summary of Virtualization Capacity (Sub-capacity) Licensing Requirements (page 3)
- License Counting - Definitions, Scenarios, Rules (page 4-8)
  - Definitions (page 4)
  - Operating System Scenario (page 5)
  - BIOS Settings Scenario (page 6)
  - Licensing Rules (page 7)
- Manual Calculation of Virtualization Capacity – if allowed (page 8-11)
  - Eligibility Criteria & Requirements (page 9)
  - Rules (page 10)
  - Worksheet Example (page 11)
- Other
  - Key Web Links (page 12)
- Backup
  - OS Command Examples (page 14-17)

Summary of Virtualization Capacity Licensing Requirements

- Customers must:
  - Agree to the terms of the Sub-capacity Attachment, and follow Virtualization Capacity License Counting rules for their Eligible Virtualization Environment(s)
  - Use Eligible Sub-capacity Products
  - Use Eligible Virtualization Technologies
  - Use Eligible Processor Technologies
  - Use the IBM License Metric Tool (ILMT) and maintain report documentation
    - Tivoli Asset Discovery for Distributed V7.2 (TADd) may be used in lieu of IBM License Metric Tool V7.2
    - Certain ILMT / TADd use exceptions may apply

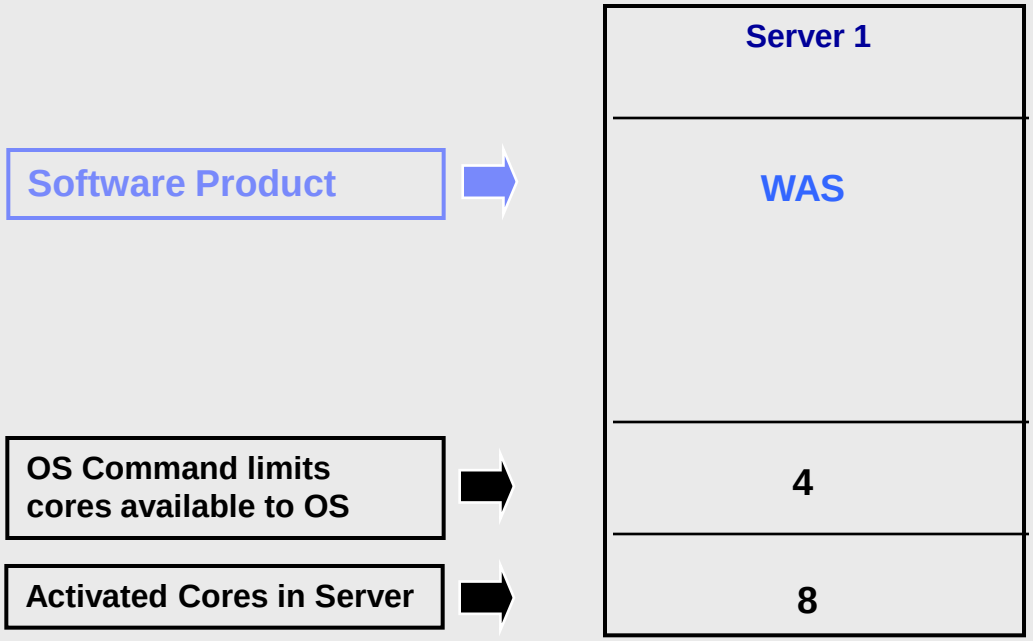
PLEASE NOTE:

- *The above is only a summary. For details about sub-capacity licensing requirements, see the Sub-capacity Attachment and other information referred to above, at* ***Passport Advantage Virtualization Capacity website***
- *Customers are responsible for the installation of the IBM License Metric Tool and for the server it runs on.*

OS Commands and BIOS Settings for x86 Servers - Definitions

- **OS Commands** – Executing OS Commands to limit the number of processor cores available on the server.
  - A x86 architecture OS may allow users to limit the number of processor cores available on the server by issuing OS commands
  - Users should refer to the users manual of their OS for the instructions and support of such commands
    - *See the examples in the Backup section of this presentation*
- **BIOS Settings** - Changing BIOS settings to limit the number of processor cores available on the system
  - A x86 architecture server may allow users to limit the number of processor cores available on the server by changing BIOS settings.
  - Users should refer to the users manual of their systems for the instructions and support for changing BIOS settings

License counting in a x86 Server using OS Commands to limit processor core capacity available



License counting using OS commands

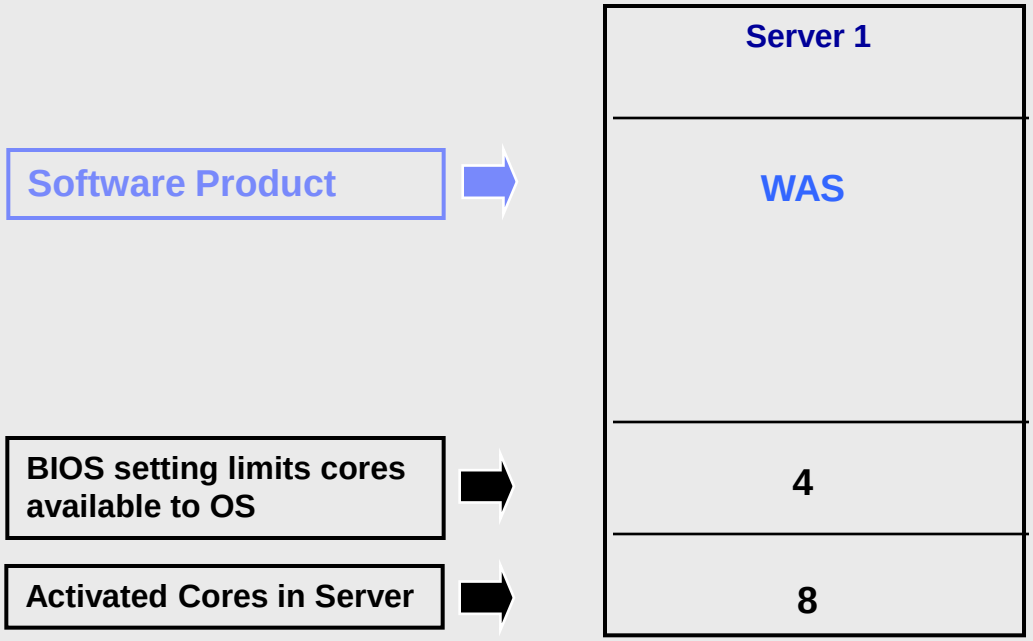
- Eligible OS commands can be used to limit processor core capacity available to the OS
- License PVUs for the maximum number of physical cores available to the product in each server

- For above example, the PVU Virtualization Capacity licensing requirement is based on the maximum number of physical cores available to a product in each server

Cores to License	Server 1	Virtualization Capacity
WAS	4	4

Full Capacity
8

License counting in a x86 Server using BIOS settings to limit processor core capacity available



License counting using BIOS setting

- Eligible BIOS settings can be used to limit processor core capacity available to the OS
- License PVUs for the maximum number of physical cores available to the product in each server

- For above example, the PVU Virtualization Capacity licensing requirement is based on the maximum number of physical cores available to a product in each server

Cores to License	Server 1	Virtualization Capacity
WAS	4	4

Full Capacity
8

OS Commands and BIOS Settings for x86 Servers - Licensing Rules

The PVU Virtualization Capacity licensing requirement is based on the maximum number of physical cores available to a product in each server

- The licensing rules in the preceding pages reflect how ILMT will operate to calculate PVUs

- If ILMT does not yet support a Eligible Virtualization Environment, or you qualify for an exception to use ILMT, you will need to follow the Manual Calculation of Virtualization Capacity.

- The Manual Calculation of Virtualization Capacity rules can be found in the following pages

- To find out if a Eligible Virtualization Technology is supported by ILMT visit
  Passport Advantage Sub-capacity licensing information

Manual Calculation of Virtualization Capacity

- Eligibility Criteria: Customers must use the IBM License Metric Tool, with the following exceptions
  - ILMT does not support the Eligible Virtualization Environment
  - Customer has fewer than 1000 employees and contractors - Tool recommended
  - Customer server Full Capacity licensing for a PVU product is less than 1000 PVUs (on servers with an Eligible Virtualization Environment) - Tool recommended

- Requirements: For the above exceptions, customers must manually manage, track and prepare Audit Reports
  - An Audit Report must be prepared at least once per quarter and identify the following detail: Each Eligible Sub-Capacity Product deployed in each Eligible Virtualization Environment
  - An Eligible Virtualization Environment can be a Single Server or a Group of Servers (Server Cluster)
  - In addition to the above detail, the report should provide a summary total of the required number of PVUs by and for each Eligible Sub-Capacity Product
  - Audit Reports must be prepared as frequently as is required to maintain a history of increases to Virtualization Capacity and Full Capacity
  - Each Audit Report must be **signed and date stamped**, at least once per quarter

The above is only a summary. For detailed terms please see the ***Passport Advantage Sub-capacity licensing information***

Manual Calculation of Virtualization Capacity – Rules

The PVU Virtualization Capacity licensing requirement is based on the maximum number of physical cores available to a product in each server

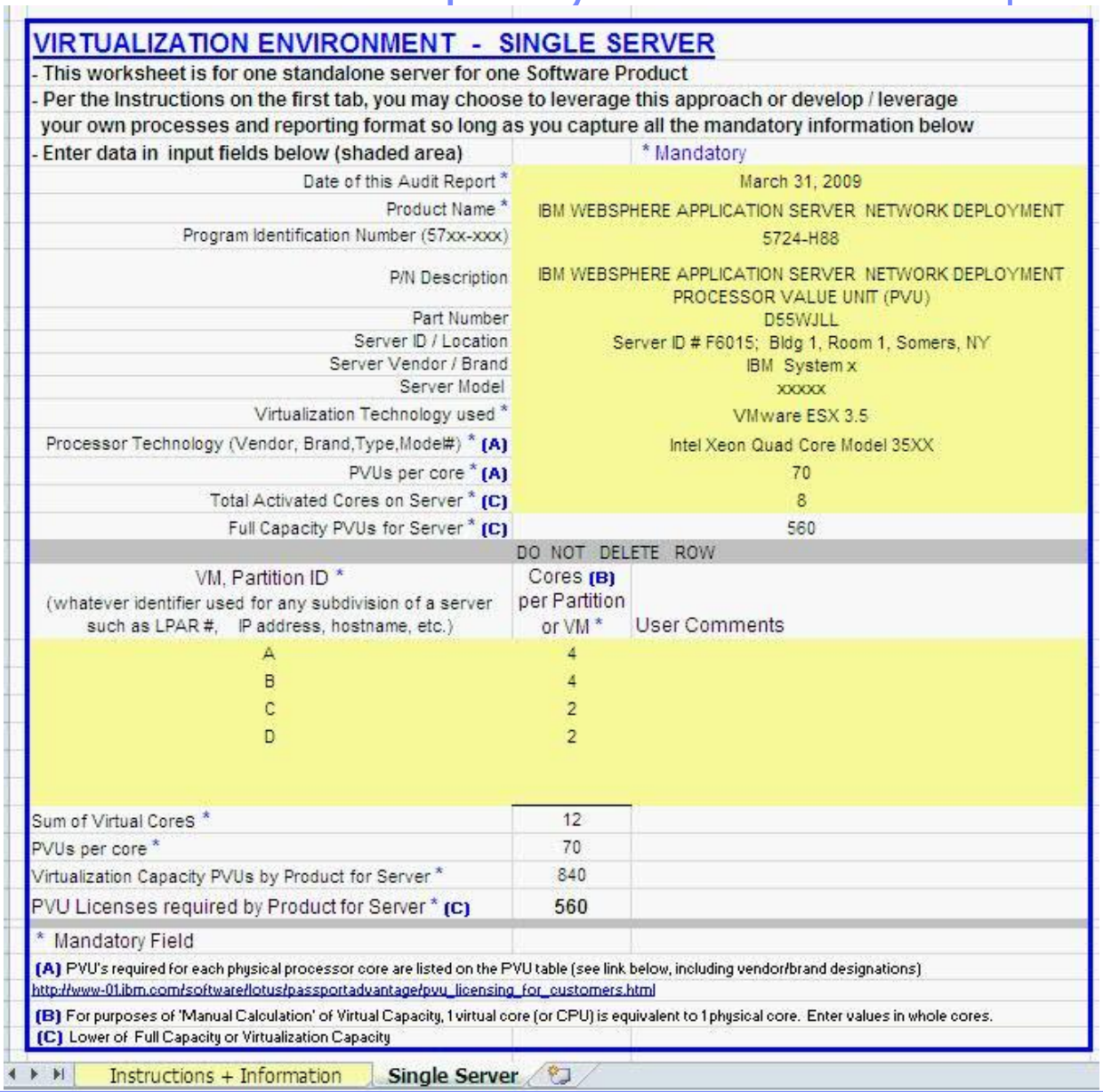
Manual Calculation of Virtualization Capacity - Worksheet Example

Worksheet has 3 tabs;

use the following tabs

- Instructions & Information
- Single Server

Web Link: Worksheet for Manual Calculation of Virtualization Capacity



VIRTUALIZATION ENVIRONMENT - SINGLE SERVER

- This worksheet is for one standalone server for one Software Product
- Per the Instructions on the first tab, you may choose to leverage this approach or develop / leverage your own processes and reporting format so long as you capture all the mandatory information below
- Enter data in input fields below (shaded area)

* Mandatory

Date of this Audit Report *	March 31, 2009
Product Name *	IBM WEBSPHERE APPLICATION SERVER NETWORK DEPLOYMENT
Program Identification Number (57xx-xxx)	5724-H88
P/N Description	IBM WEBSPHERE APPLICATION SERVER NETWORK DEPLOYMENT PROCESSOR VALUE UNIT (PVU)
Part Number	D55WJLL
Server ID / Location	Server ID # F6015; Bldg 1, Room 1, Somers, NY
Server Vendor / Brand	IBM System x
Server Model	xxxxx
Virtualization Technology used *	VMware ESX 3.5
Processor Technology (Vendor, Brand,Type,Model#) * (A)	Intel Xeon Quad Core Model 35XX
PVUs per core * (A)	70
Total Activated Cores on Server * (C)	8
Full Capacity PVUs for Server * (C)	560

DO NOT DELETE ROW

VM, Partition ID * (whatever identifier used for any subdivision of a server such as LPAR #, IP address, hostname, etc.)	Cores (B) per Partition or VM *	User Comments
A	4	
B	4	
C	2	
D	2	

Sum of Virtual Cores *	12
PVUs per core *	70
Virtualization Capacity PVUs by Product for Server *	840
PVU Licenses required by Product for Server * (C)	560

* Mandatory Field

(A) PVU's required for each physical processor core are listed on the PVU table (see link below, including vendor/brand designations)
http://www-01.ibm.com/software/lotus/passportadvantage/pvu_licensing_for_customers.html

(B) For purposes of 'Manual Calculation' of Virtual Capacity, 1 virtual core (or CPU) is equivalent to 1 physical core. Enter values in whole cores.

(C) Lower of Full Capacity or Virtualization Capacity

Instructions + Information | Single Server

Key Web Links

- PVU
  - PVU table and other information

- Sub-capacity
  - Passport Advantage Sub-capacity licensing information
  - Virtualization Capacity License Counting Rules
  - Sub-capacity licensing attachment

BACKUP

OS Command for x86 Servers - Examples

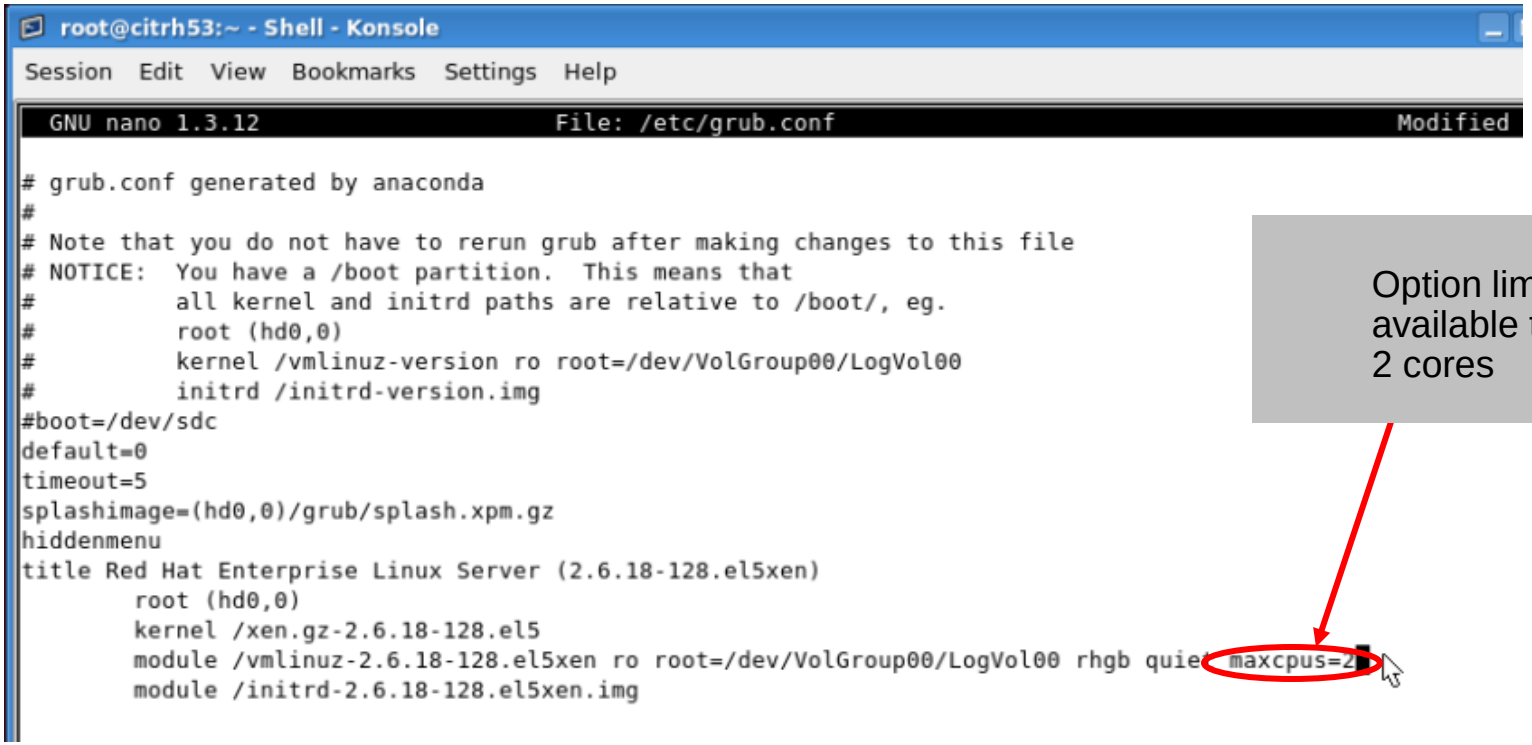
- **OS Commands** – Executing OS Commands to limit the number of processor cores available on the server.
  - A x86 architecture OS may allow users to limit the number of processor cores available on the server by issuing OS commands
  - Users should refer to the users manual of their OS for the instructions and support of such commands
  - Examples provided as a reference only
    - *Linux Example*
      - Change the grub.conf file for Linux
      - • Method 1: run “nano /etc/grub.conf” command and add “maxcpus=#” to kernel module option
      - • Method 2: run "echo "0" > /sys/devices/system/cpu/cpuN/online" to deactivate core nr N

        Hint: you can verify number of physical cores active in Linux OS box by executing below command:

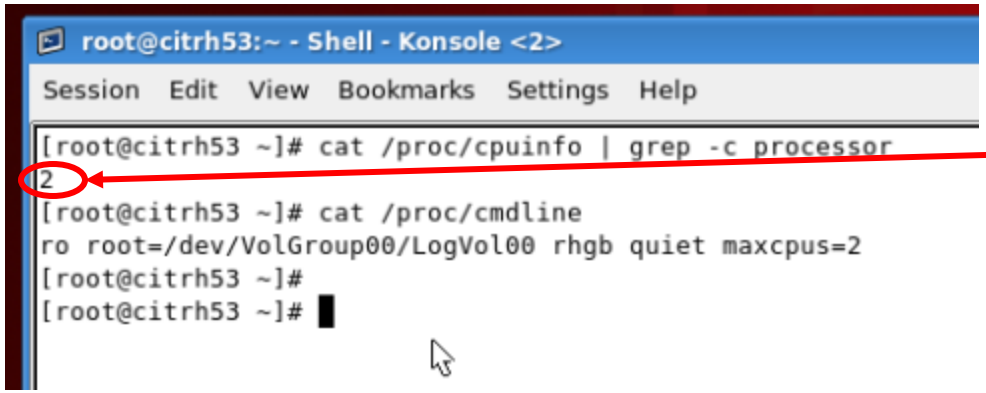
        # cat /proc/cpuinfo | egrep "core id|physical id" | tr -d "\n" | sed s/physical/\\nphysical/g | grep -v ^$ | sort | uniq | wc -l
    - *Windows Example*
      - Change the boot.ini or BCD (Boot Configuration Data) files on Windows
      - • Method 1: run „BCDefit.exe /set numproc #” command
      - • Method 2: run “msconfig” command->select “BOOT.INI” tag->select “Advanced options”->enter core number for \NUMPROC

See screenshots on next three pages

Linux OS command to limit cores

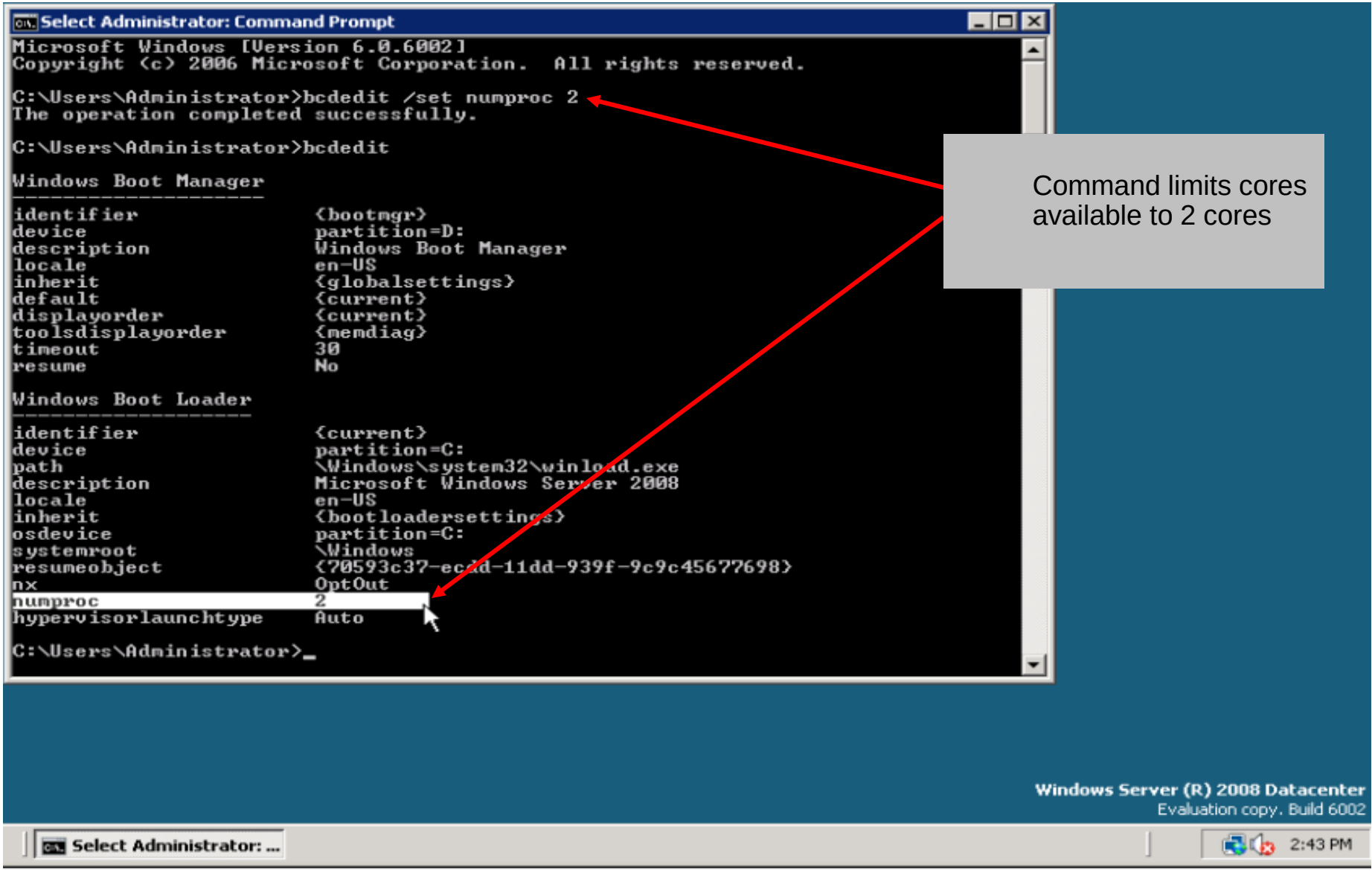


Option limits cores available to the OS to 2 cores

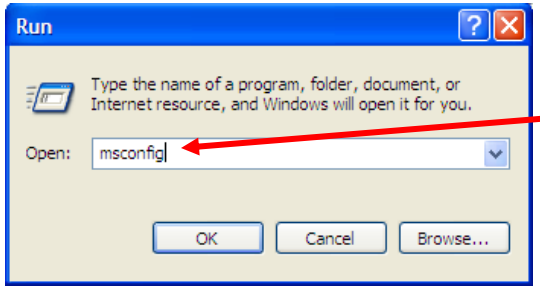


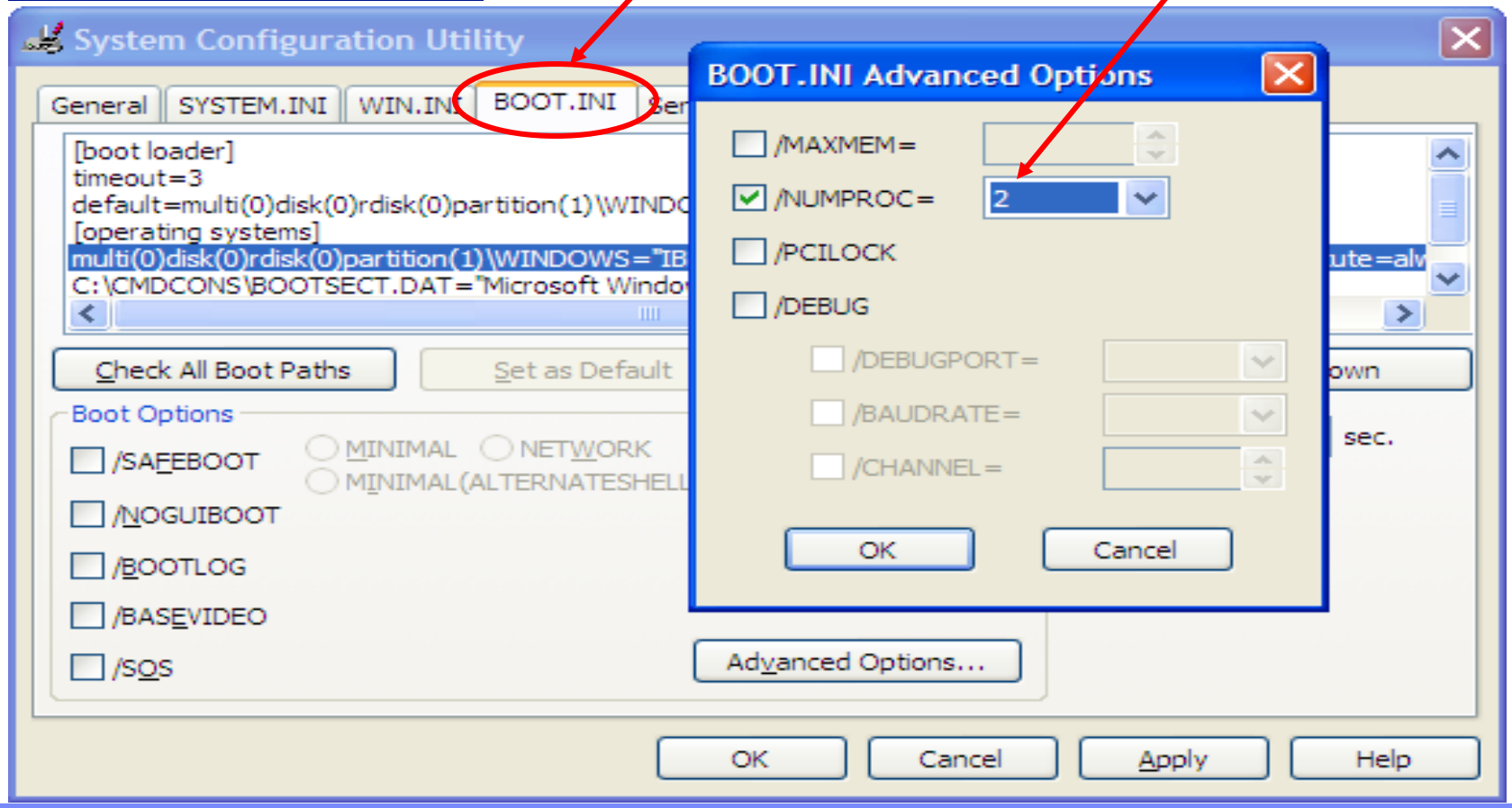
Command validates that only 2 cores are available to the OS

Windows OS command to limit available cores



Windows OS command to limit available cores



Command for boot.ini file updates

Setting limits cores available to 2 cores