

# Virtual Serial Number (VSN) Update

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# Virtual Serial Number Announcement

January 25, 2022:

**IBM enables ordering of virtual serial numbers on selected IBM Power technology-based servers for use with IBM i**

IBM now offers a customer the ability to acquire a Virtual Serial Number (VSN) and assign it to a logical partition. IBM i software can then be ordered on or transferred to the VSN instead of being tied to a physical IBM Power machine's serial number. Having the IBM i entitlement, keys, and support entitlement on a VSN provides the flexibility to move the partition to a different Power machine.

Virtual Serial Numbers can be ordered in specific countries: refer to the announcement letters in each geography

[U.S. Announcement 122-017](#)

[Europe Announcement ZG22-0022](#)

[Asia Pacific Announcement AG22-0017](#)

[Canada Announcement A22-0093](#)

# Virtual Serial Number Announcement, cont.

IT Jungle:

<https://www.itjungle.com/2022/01/31/the-ibm-i-cloud-just-got-more-frictionless-with-virtual-serial-numbers>

The latest information will be published on [IBM i License Topics](#) > “Virtual Serial Number”

- Process document: how to order, assigning a VSN to a partition, Q&A, etc.
- Additional webinar
  - Virtual Serial Number office hour for ISVs
  - Tuesday March 1st: 9 AM CST

# Physical Hardware Serial Number vs. Virtual Serial Number

## Hardware Serial #

Partition 1	Partition 2	Partition 3
Serial = 78-12345	Serial = 78-12345	Serial = 78-12345

Hardware Serial = 78-12345

All partitions use the hardware serial number of the physical server

## Virtual Serial Number (VSN)

For example, on **9009-22G S/N 78-12345 > order FC #EVSN**

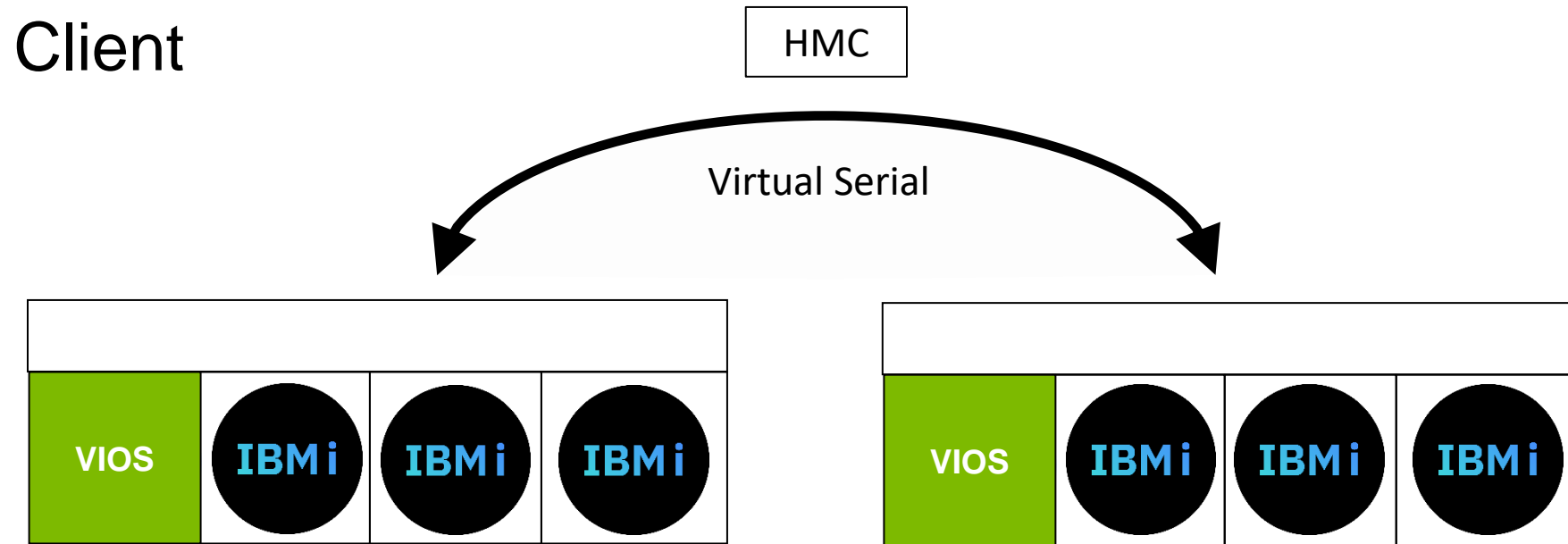
Partition 1	Partition 2	Partition 3
4850-VSN P10 Serial = V0-11111	Serial = V0-22222	Serial = V0-33333

Hardware Serial = 78-12345

With a VSN, each partition can have its own serial number that is not tied to the hardware serial number. The hardware serial number is still there and is used to identify the physical box and is the default in a partition if a VSN is not used.

# VSN Phase 1: Order/Transfer Within a Customer Enterprise

Virtual Serial Number partitions can be moved across systems where the HMC can see both servers or has network connectivity to another HMC that can see the other server. This is the same limitation as LPM.



**Important note:**

→ In Phase 1, VSNs are not supported in PEP 2.0 environments

# VSN Requirements

- A Power9 or Power10 server
  - IBM Power S914 (9009-41A, 9009-41G), IBM Power S922 (9009-22A, 9009-22G), IBM Power S924 (9009-42A, 9009-42G), IBM Power E980 (9080-M9S), and IBM Power E1080 (9080-HEX) running firmware level FW950 (or later)
- HMC Version 9.2.950 (or later)
- IBM i 7.4, 7.3, 7.2
  - Minimum IBM i TR level/PTFs

IBM i 7.4 TR3	IBM i 7.3 TR9	IBM i 7.2
MF67721	MF67723	MF67853
MF67863	MF67862	MF67861
MF68035	MF68042	MF67871
SI74470	SI74682	SI74687

# VSN Ordering – e-Config

- How do I order a VSN?
  - You can acquire a VSN(s) by placing an order for feature #EVSN. This is available on new machine orders or as an upgrade on existing machines.
  - Within e-Config, from the “Codes” section and “Order Codes” area enter the desired quantity for feature #EVSN

Order Codes	Proposed
(2145)-Primary OS - IBM i	1
(EB3V)-IBM i 7.1 Activation for E980	0
(EB74)-IBM i 7.4 Indicator	1
(ER1A)-Specify Reserve 4 EIA Rack Space for PCIe3 Expansion Drawer	0
(ESC0)-S&H - No Charge	1
(ESC9)-S&H	0
(EVSN)-Enable Virtual Serial Number	1

- What is the cost of a single VSN?
  - \$100

EVSN	Enable Virtual Serial Number	1	100.00
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- What if I no longer need my VSN(s)? Can I return them? Will I get a refund?
  - Once purchased a VSN remains with the customer. There is no way to return a VSN to IBM or get a refund.

# VSN Ordering

- What is 4850-VSN?
  - At the time when a VSN is reserved, an IBM inventory record is created for each VSN, similar to physical machine inventory records. The IBM Virtual Server Serial (4850-VSN) is a new machine type and model created specifically for VSNs. The 4850-VSN is associated with each VSN in IBM's inventory records. The 4850-VSN and its associated features are not orderable in e-Config, but they are automatically assigned to the VSN record. When a VSN record is retrieved from IBM Inventory Services, the 4850-VSN is associated with the record.

Description	Machine type	Model number	Feature number
IBM Virtual Server Serial	4850	VSN	
P05 for IBM i SW Tier	4850	VSN	EVS1
P10 for IBM i SW Tier	4850	VSN	EVS2
P20 for IBM i SW Tier	4850	VSN	EVS3
P30 for IBM i SW Tier	4850	VSN	EVS4
Processor Core Value	4850	VSN	EVS5
Processor Activation Value	4850	VSN	EVS6



- What do I do after I order the VSN feature?

Once the feature #EVSN is ordered, and the order is installed:

- Email the Key Center ([WWSWKEYS@dk.ibm.com](mailto:WWSWKEYS@dk.ibm.com)) to request the Capacity on Demand (CoD) code – *refer to the detailed instructions on the next page.*
- The next available VSNs based on ordered quantity are reserved.
- A CoD code is generated and sent to the customer.
- For each VSN, an IBM inventory record is created (similar to physical machine inventory records).

# VSN steps

## Steps to acquire VSNs:

1. Order EVSN feature on the eligible Power machine. Specify the desired quantity.
2. Once the order is installed, send the email to the Key Center asking for the ordered quantity of VSNs:

[WWSWKEYS@dk.ibm.com](mailto:WWSWKEYS@dk.ibm.com)

Subject line of email: “request VSNs for S/N xxxx yy-yyyyyy for order zzzzzz”

(where “xxxx” is the four digit machine type (e.g., 9009, 9080, etc.),

“yy-yyyyyy” is the seven-digit machine serial number (78-12345), and

“zzzzzz” is the plant order number )

- The default Customer Number (“C/N”) for the VSN is the same C/N as the physical HW
- To assign the VSN to a different C/N instead of the default, specify the C/N to which to assign to a VSN (“install at” C/N)
- E.g. order 5 VSNs: assign 4 VSNs to the default C/N, and assign 1 VSN to the C/N which is assigned to the Eastern US division of the company C/N 8920442446

*“Subject: request VSNs for S/N 9009 78-12345 for order A2UEB9*

*Key Center,*

*For the 5 VSNs on order A2UEB9, please assign the Customer Numbers as follows:*

*1 VSN = Customer Number 8920442446*

*Remaining VSNs = default Customer Number”*

Result: the client gets a CoD for 5 VSNs to install on their machine. 5 VSNs are added to inventory records with assigned C/Ns.

3. Customer installs the CoD code on their Power machine.
4. The customer either...
  - buys IBM i and LPPs on their assigned VSN, or
  - transfers IBM i (via IBM i Entitlement Transfer offering for \$5000/core (USD list price)) and/or LPPs to their assigned VSN

Result: customer has software and support entitlement on the VSN

5. Customer creates a partition and assigns the client’s VSN to the partition

 **Important: Once the VSN is added to inventory, the Customer Number on the VSN cannot be changed.**

# VSN Ordering – ESS

- Once a CoD code has been generated, you can retrieve it from the IBM Entitled System Support (ESS) web site:
  - [Entitled Systems Support](#)>>>My entitled hardware>>>Power COD

Existing Capacity on Demand codes and Utility Capacity on Demand history


Search for a machine to display a list of Capacity on Demand codes.  
For Power Enterprise Pools 1.0, you can [download XML configuration file here](#).

Machine type-model:  Serial number:

7 characters

Showing results for machine: Existing activation codes Utility CoD history

🔍 Start typing to find a record

Activation code type	Sequence number	Quantity ordered	Activation code	Creation date
 Start by finding a machine above Choose machine type-model and fill in your machine serial number.				

Items per page: 5  0-0 of 0 item of 1 page

# VSN Ordering – HMC/CoD

- After receiving the CoD code for the Power machine on which feature #EVSN order was placed, it needs to be installed.
- The CoD code contains the reserved VSN(s) and installing the CoD code makes the reserved VSN(s) available on the machine.
- To enter a CoD code on a server, use an HMC and the Capacity on Demand>>>CoD functions>>>Enter CoD Code task.

### Capacity On Demand Functions

Name	CoD Processor Capability	CoD Memory Capability
erp9s1e-9009-42A-SN13F53BW	✓ On	✓ On

[Enter CoD Code](#)

[View CoD History Log](#)

### Enter CoD Code: erp9s1e-9009-42A-SN13F53BW

Code: \*

OK Cancel Help

### CoD History Log: erp9s1e-9009-42A-SN13F53BW

Time Stamp	Log Entry
2/9/22 4:05:21 PM UTC	HSCL0371 Virtual serial number activation code entered

Close Help

# VSN Implementation

- When creating a new partition (or modifying an existing one), the options are:
  - **No VSN:** Select No VSN if you do not want to assign a VSN to the partition (the default)
  - **Auto-assign:** Select Auto-assign if you want the system to automatically assign a VSN to the partition
  - **Select from pool:** Choose the Select from pool option if you want to manually assign a VSN to a partition. Click Select VSN to open the VSN window. The window lists the VSNs that can be assigned to the partition.

Create Partition(s) Create using Templates →

**i** The system supports processor sharing, the partition created contains virtual processors Single Partition ◀ ▶ Multiple Partitions

You can use the switch to create one or more partitions with minimum or configured resources. Multiple Partition creation support Add or Remove partitions as per the need using +/- icon. These partitions will show up in partitions view. Please add storage and network before activating the partition.

Assign All System Resources

Basic Partition Configuration

Partition Name: \*

Partition ID:

Partition Type:  AIX/Linux  IBM i

Maximum Virtual Adapters:

Virtual Serial Number  No VSN  Auto-assign  Select from pool

**Virtual Serial Number Selection Panel**

Select the virtual serial number that you want to associate with the logical partition.

Select VSN Group

Select a VirtualSerialNumber

Virtual Serial Number	
<input type="radio"/>	VSHWKQLQ
<input type="radio"/>	VSHWKLR

- Can I change a partition with a VSN to no VSN? Or to a different VSN?
  - Yes. First the partition has to be in a “Not activated” state to modify the VSN.

# VSN Implementation

- Each partition with a VSN requires that IBM i software be ordered or transferred to that VSN
- Start by retrieving the VSN from inventory records then
  - Order new IBM i portfolio software (operating system LPPs, etc) for the VSN
  - or
  - Transfer IBM i (via the IBM i Entitlement Transfer Offering, \$5000 USD list price per core) and LPPs to the VSN
- Suppose I have a VSN partition and use Live Partition Mobility to move the partition from one physical machine to another physical machine: do I have to pay the IBM i license transfer fee?
  - No. The IBM i license transfer fee is only to transfer IBM i entitlements (processor/user) to a VSN. That is a one-time charge. Once IBM i software is associated to a VSN (purchased or transferred), it can move around the customer enterprise where the HMC can see the servers.

# Transfer IBM i Software to a VSN – Example 1

## Example 1 - Before the transfer

Hardware Serial = 78-12345  
IBM i processor = 1  
IBM i users = 10  
BRMS (5770-BR1)  
Performance Tools (5770-PT1)

Donor Machine – S/N 78-12345

- All SW is entitled and keyed to the Serial Number 78-12345

Customer wants to transfer all SW to VSN V0-00005

Transfer order placed:

- Config the transfer of IBM i processor and users from 78-12345 to V0-00005 (same IBM i transfer steps as with system replacement)
- Transfer LPPs (BRMS and Performance Tools) either via ESS or on the IBM i transfer config

# Transfer IBM i Software to a VSN – Example 1

## Example 1 - After the transfer

Hardware Serial = 78-12345  
~~IBM i processor = 1~~  
~~IBM i users = 10~~  
~~BRMS (5770-BR1)~~  
~~Performance Tools (5770-PT1)~~

VSN= V0-00005  
IBM i processor = 1  
IBM i users = 10  
BRMS (5770-BR1)  
Performance Tools (5770-PT1)



# Transfer IBM i Software to a VSN – Example 2

## Example 2 - Before the transfer

Hardware Serial = 78-12345  
IBM i processor = 4  
IBM i users = 10  
BRMS (5770-BR1)  
Performance Tools (5770-PT1)

Donor Machine – S/N 78-12345

- All SW is entitled and keyed to the Serial Number 78-12345

On VSN V0-00005, customer...

- Needs to transfer 2 of the 4 IBM i processor entitlements from 78-12345 to the VSN
- Also needs 5 IBM i users, BRMS, and Performance Tools on the VSN

Orders placed:

- Config the transfer of 2 IBM i processor entitlements from 78-12345 to V0-00005 (same IBM i transfer steps as with system replacement)
- Order new on V0-00005: 5 IBM i users, BRMS, and Performance Tools

# Transfer IBM i Software to a VSN – Example 2

## Example 2 - After the transfer

Hardware Serial = 78-12345  
IBM i processor = 2 (instead of 4)  
IBM i users = 10  
BRMS (5770-BR1)  
Performance Tools (5770-PT1)

VSN= V0-00005  
IBM i processor = 2  
IBM i users = 5  
BRMS (5770-BR1)  
Performance Tools (5770-PT1)

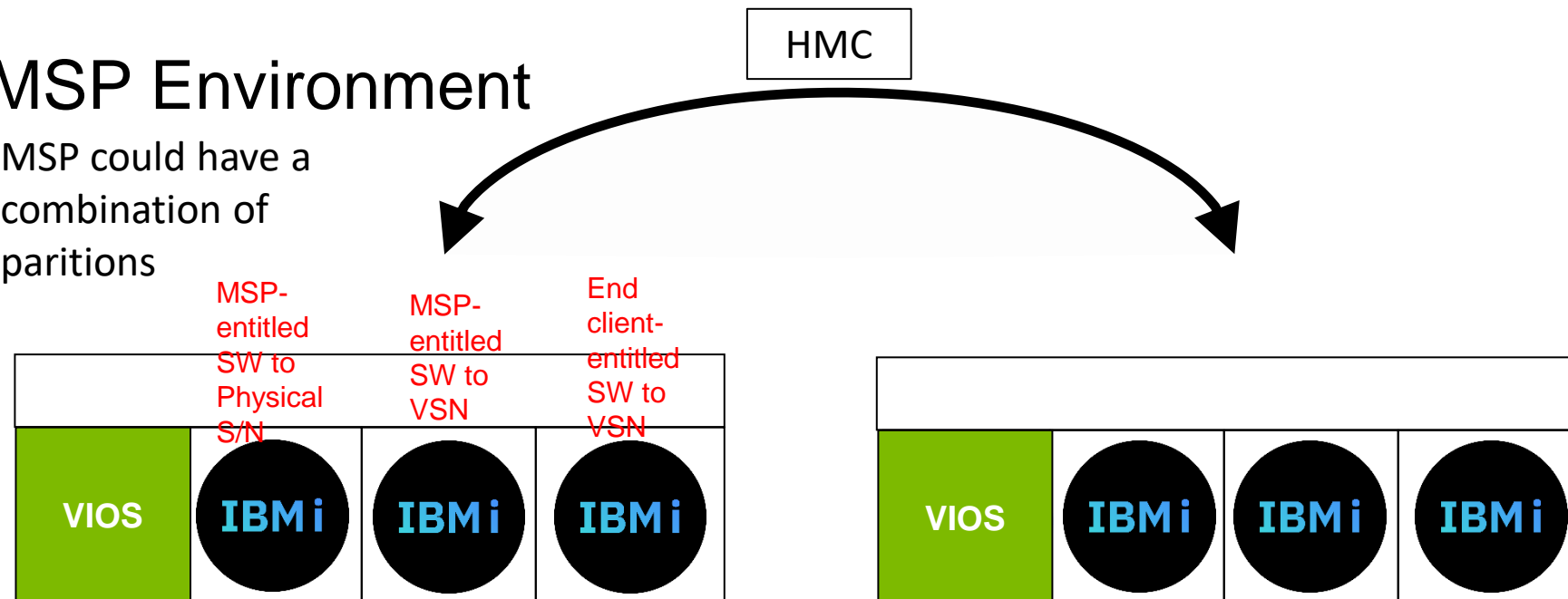
# Managed Service Providers (MSPs)

Steps to get clients enabled on MSP-owned hardware:

1. MSP orders EVSN feature for a quantity of VSNs for their machine.
  - MSP sends email request to the Key Center for their CoD code which will populate the VSNs:
    - The default Customer Number (“C/N”) for the VSN is the same C/N as the physical HW
    - To assign the VSN to an end client C/N instead of the default, in the email specify the C/N to which to assign to VSNs (“install at” C/N)
2. For VSNs which are assigned to end client C/N, the end client:
  - Buys IBM i and LPPs on their assigned VSN, or
  - Transfers IBM i for \$5000/core (USD list price) and LPPs to their assigned VSNResult: client has software and support entitlement on the VSN
3. MSP creates a partition and assigns the client’s VSN to the partition

## MSP Environment

MSP could have a combination of partitions



## Steps for MSPs to get client-entitled VSNs on MSP-owned hardware:

1. MSP orders EVSN feature on their machine. Specify the desired quantity
2. Once the order is installed, send the email to the Key Center asking for the ordered quantity of VSNs:  
Subject line of email: “request VSNs for S/N xxxx yy-yyyyyy for order zzzzzz”  
(where “xxxx” is the four digit machine type (e.g., 9009, 9080, etc.),  
“yy-yyyyyy” is the seven-digit machine serial number (78-12345), and  
“zzzzzz” is the plant order number )
  - The default Customer Number (“C/N”) for the VSN is the same C/N as the physical HW
  - To assign the VSN to an end client C/N instead of the default, specify the C/N to which to assign to a VSN (“install at” C/N)
  - E.g. order 5 VSNs: 4 of the VSNs will have the default C/N, 1 will have end client C/N 8920442444  
*“Subject: request VSNs for S/N 9009 78-12345 for order A2UEB7  
Key Center,  
For the 5 VSNs on order A2UEB7, please assign the Customer Numbers as follows:  
1 VSN = Customer Number 8920442444  
Remaining VSNs = default Customer Number”*

Result: MSP gets a CoD for 5 VSNs to install on their machine. 5 VSNs are added to inventory records with assigned C/Ns.
3. MSP installs the CoD code on their Power machine.
4. MSP gives the end client the VSN which is assigned to the end client C/N.
5. The end client either...
  - buys IBM i and LPPs on their assigned VSN, or
  - transfers IBM i (via IBM i Entitlement Transfer offering for \$5000/core (USD list price)) and/or LPPs to their assigned VSN

Result: client has software and support entitlement on the VSN
6. MSP creates a partition and assigns the client’s VSN to the partition

 **Important: Once the VSN is added to inventory, the Customer Number on the VSN cannot be changed.**

- Customers should be aware that a partition with a VSN only supports IBM i software in whole core boundaries (such as 1.0, 2.0, 3.0) since IBM i is licensed in whole core increments.
- Can I share a VSN between multiple partitions?
  - No. A VSN is unique to a partition. If you want multiple partitions to share the same serial number, you will have to use the base (physical) hardware serial number.
- For Licensed Program Products (LPPs for i) and IBM i optional features which are priced and entitled to the server: the entire entitlement is transferred to the VSN.
  - Example: You have a machine with 2 partitions assigned to the physical serial number, and 1 partition assigned to a VSN. All partitions need BRMS. Therefore, you'll need one BRMS entitlement for the partitions based on physical serial number, and one BRMS entitlement for the VSN.
- VSNs are tied to the SW tier on which the VSN was ordered and created.
  - I order VSNs on a 9009-22G (S922) which is at a P10 software tier. My VSNs will inherit the P10 software tier. That P10 tier VSN can move to other P10 tier machines under the same HMC.

# VSN Implementation

- How can I tell if a partition is using a physical serial number or VSN?
  - On an HMC for a given partition look at Properties>>>General Properties.

General	
View and modify the client partition name and enable the advanced and virtualization capability for the partition. You can also specify the system for the partition. <a href="#">Learn More</a> →	
Partition Name:	erp9j1p2
OS Type / Environment:	IBMi
OS Version:	IBM i Licensed Internal Code 7.3.0 410 9
IP Address:	Unknown
Resource Configuration:	Configured
IPL Source:	B
Key Lock Position:	<input type="radio"/> Manual <input checked="" type="radio"/> Normal
System Machine Type * Serial Number:	9009-42A*13F53BW
Description:	
Group Tags:	
<b>Virtual Serial Number</b>	No VSN

General	
View and modify the client partition name and enable the advanced and virtualization capability for the partition. You can also specify the system for the partition. <a href="#">Learn More</a> →	
Partition Name:	erp9j1p3
OS Type / Environment:	IBMi
OS Version:	IBM i Licensed Internal Code 7.3.0 410 9
IP Address:	Unknown
Resource Configuration:	Configured
IPL Source:	B
Key Lock Position:	<input type="radio"/> Manual <input checked="" type="radio"/> Normal
<b>System Machine Type * Serial Number:</b>	<b>9009-42A*13F53BW</b>
Description:	
Group Tags:	
<b>Virtual Serial Number</b>	<b>VSHWKLP</b>

# VSN Implementation

- How can I tell if a partition is using a physical serial number or VSN?
  - From IBM i: DSYSYSVAL QSRLNBR
  - Note: Not all serviceability screens will reflect the VSN

```
Display System Value
System value . . . . . : QSRLNBR
Description . . . . . : System serial number
Serial number . . . . . : VSHWKLP

Press Enter to continue.
F3=Exit  F12=Cancel
```

# VSN Implementation

- How can I tell if a partition is using a physical serial number or VSN?
  - From IBM i: New Navigator for i
  - Configuration and Service>>>System Values>>>double-click on System and User Defaults or right-click on System and User Defaults>>>click Properties>>>select the System tab

**System Values: System and User Defaults**

<b>System</b>	Model number (QMODEL):	42A
User	Serial number (QSRLNBR):	VSHWKLP
	Processor feature code (QPRCFEAT):	EP1E
	Console name (QCONSOLE):	DSP01
	<b>Processor multitasking (at next restart) (QPRCMLTTSK)</b>	
	<input checked="" type="radio"/>	On
	<input type="radio"/>	Off
	<input type="radio"/>	System controlled



# VSN Implementation

- Is there a way to programmatically determine if a partition has a VSN or the base physical serial number?
- From IBM i:
  - MI instruction Materialize Machine Attributes (MATMATR) option 0004 returns serial number. For a partition with a VSN, that is what will be returned. For a partition not using a VSN, the physical or hardware serial number will be returned. MATMATR option 0005 will always return the physical serial number. Option 0005 was recently added to IBM i 7.2 and later.

<https://www.ibm.com/docs/en/i/7.4?topic=instructions-materialize-machine-attributes-matmatr>

<https://www.ibm.com/support/pages/apar/MA48573>

- From an HMC:
  - Use the recently added lsvsn - list virtual serial numbers command.  
<https://www.ibm.com/docs/en/power10/000V-HMC?topic=commands-lsvsn>

- Can I use a VSN with Power Enterprise Pools (PEP) 2.0?
  - No. If a system has partitions with a VSN assigned, the system cannot be added to an Enterprise Pool 2.0. Alternatively, if a system is already in an Enterprise Pool 2.0, then it cannot assign a VSN to a partition and cannot be a target to receive (via LPM or SRR) a VSN-enabled partition.
- Can I move a partition with a VSN from on-prem to IBM Power Virtual Server (PowerVS)?
  - No, not currently. Today partitions can only move within on-prem or within the management of the same HMC(s).
- Can I move a partition with a VSN from on-prem to a Managed Service Provider or Cloud Service Provider?
  - No, not currently. Today partitions can only move within on-prem or within the management of the same HMC(s).

- How does a VSN affect ISV software licensing?
  - Independent Software Vendors (ISVs) have various licensing metrics that are not under the control or influence of IBM. For software licensed by something unique to physical hardware such as system serial number, processor feature, partition ID, and so on, upgrading/replacing a system or using LPM or adopting VSN will probably require an ISV licensing discussion for that ISV software. Once software is licensed (and is tied to a serial number) to a partition with a VSN, it should not have to be re-licensed since the VSN should remain constant unless changed by a customer.
- Does VSN affect products with sub-capacity pricing within a partition using IBM i workload groups?
  - No. Starting with IBM i 7.1, workload groups were added which provide the ability to restrict a workload to a specified maximum number of processor cores within the partition it is running in. Many products support this virtualization technology for sub-capacity licensing such as WebSphere MQ, and this is not affected by a partition using a VSN.

<https://www.ibm.com/docs/en/i/7.4?topic=work-managing-workload-groups>

# Life Cycle of VSNs

CoD key specifying 5  
VSNs that start with 11111

VS11113  
VS11114  
VS11115

Pool of VSNs



Serial # = VS11111



Serial # = VS11112



CoD key specifying 5  
VSNs that start with 22221

VS22221  
VS22222  
VS22223  
VS22224  
VS22225  
VS11111

Pool of VSNs

