



# Managing I/O Identity on Dell Modular Blades

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# Table of contents

- Executive summary - I/O identity Management ..... 4
- 1 I/O identity Overview ..... 5
  - 1.1 Why I/O Identity ..... 5
  - 1.2 Deployment of I/O identity MAC address ..... 7
  - 1.3 Provisioning I/O Identity ..... 8
    - 1.3.1 Server profile configuration using iDRAC, RACADM, or CMC ..... 8
    - 1.3.2 WSMAN ..... 8
  - 1.4 Centralized Management of IO Identity ..... 9
    - 1.4.1 CMC GUI..... 9
    - 1.4.2 CMC CLI..... 12
    - 1.4.3 WSMAN Based Management ..... 13
- A Work Flow of I/O identity for Export for Server Configuration Profile..... 18
  - A.1 Exporting or Importing Sample Configuration File..... 18
  - A.2 Persistence Policy Settings ..... 19
  - A.3 Clearing I/O identity MAC addresses..... 20



# Executive summary - I/O identity Management

Dell PowerEdge servers provide the capability to deploy network I/O adapters with Factory assigned, Chassis assigned (also known as Flexaddress), or I/O identity assigned MAC addresses. Dell Life Cycle Controller provides a mechanism to override Factory assigned and Flexaddress MACs with user-defined I/O identity MACs. The MACs applied can be persistent and survive cold boot (depending upon firmware of network adapter and Dell Life Cycle Controller being used) thereby enabling rapid deploy and re-configuration of workloads. This document covers creating and managing I/O Identities for Dell PowerEdge M1000e, VRTX and FX2 platforms.



# 1 I/O identity Overview

Dell PowerEdge servers provide the capability to deploy network I/O adapters with Factory assigned, Chassis assigned (aka as Flexaddress) or I/O identity assigned MAC addresses. Dell Life Cycle controller provides a mechanism to override Factory assigned and Flex Address MACs with user defined I/O identity MACs. The applied MACs can be persistent and survive cold boot (depending upon the firmware of the network adapter and Dell Life Cycle Controller being used) thereby enabling rapid deployment and re-configuration of workloads. This document primarily covers the usage of iDRAC version 1.57.57 and beyond. For provisioning and managing I/O identity using earlier releases of iDRAC, refer to the white paper titled "I/O identity Setup using Dell Life Cycle Controller" by Zhang Liu, revision 1.0 available [here](#).

## 1.1 Why I/O Identity

Figure 1 displays a typical customer solution environment, which includes I/O identity capable Dell server nodes, a Console Station, and a storage network (either iSCSI, FC or a combination). Boot from SAN configuration is outside the scope of this paper but further information on Boot from SAN, see this white paper <http://partnerdirect.dell.com/sites/channel/Documents/Deploying-Dell-Networking-MXL-and-PowerEdge-M-IO-Aggregator-FC-FlexIO-Module-white-paper.pdf>.

The customer benefits of such a solution environment include:

- 1) **Easy Migration of Blade Servers:** The Virtual Address Management (I/O identity MAC addresses) can be programmed to be persistent across cold reset and AC power loss. In some scenarios a blade server needs to be replaced by moving the I/O identity to a spare server in another chassis. Persistent MAC addresses help in achieving this goal without having to reconfigure the backend scripts that provide access based on a MAC address without changing the network storage configuration.
- 2) **Operational Savings:** Boot from SAN environments enable provisioning of I/O identity based MAC/WWPN LUNs, thus enabling quicker deployment of Host OS.
- 3) **Customer Data Protection :** an iDRAC-based persistence policy for Virtual Address Management attributes enables workloads/applications to avoid a scenario where two compute nodes try to access the same SAN storage target when moving workloads.
- 4) **Flexible Provisioning:** I/O identity MACs can co-exist with server assigned and flexaddress assigned MACs. The number of I/O identity MACs provided per blade depends upon the customer solution. The value ranges from zero MACs (no I/O identity) to the maximum permissible MACs (depends upon the number of ports/partitions) by the adapters on the blade.
- 5) **Boot optimization:** Normally, after the system boots, the devices are configured and then after a reboot the devices are initialized. You can enable the I/O Identity Optimization feature to achieve boot optimization. This feature when enabled sets the virtual address, initiator, and storage target attributes after the device is reset and before it is initialized, thus eliminating a second BIOS restart. The device configuration and boot operation occur in a single system start and the system is optimized for boot time performance.



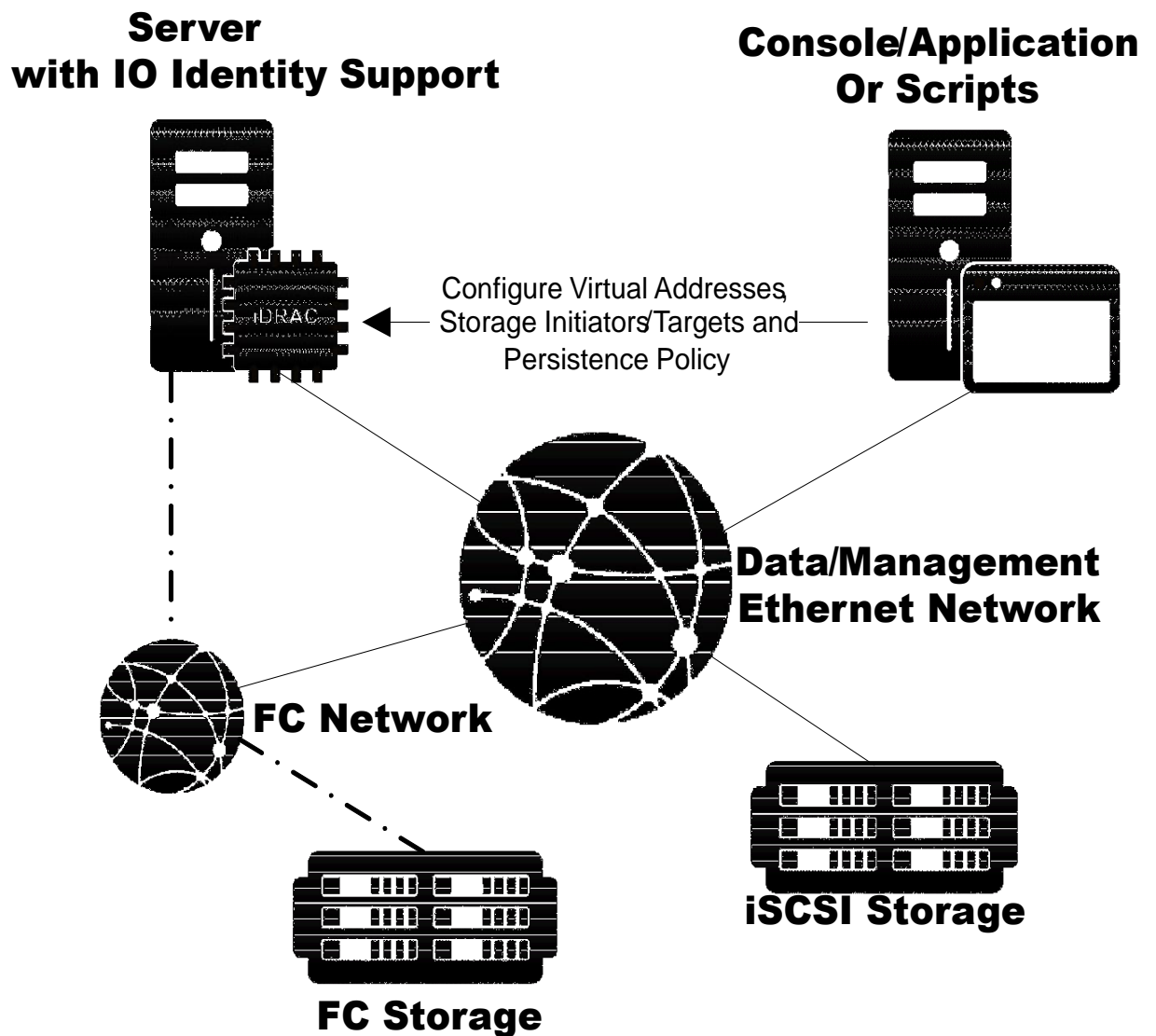


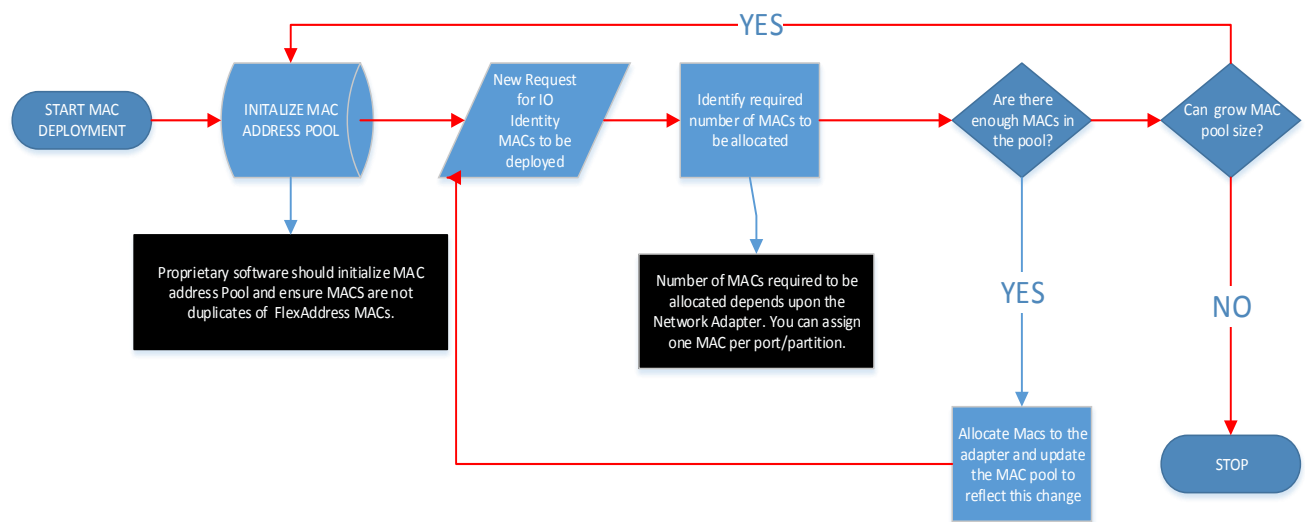
Figure 1 Deployment Scenario of IO Identity

## 1.2 Deployment of I/O identity MAC address

While there are multiple ways to deploy I/O identity MACs, the following goals should be achieved at a minimum:

1. Centrally Manage MAC addresses pool.
2. Deploy MAC addresses and avoid duplicate MAC addresses.
3. Reclaim unused MAC addresses and add it back to the pool.

The following flow chart summarizes how to achieve the minimum goals on deploying I/O Identity MAC address:



MAC address deployment Flow Chart

## 1.3 Provisioning I/O Identity

I/O identity can be provisioned using RACADM or a programmatic interface such as WSMAN.

### 1.3.1 Server profile configuration using iDRAC, RACADM, or CMC

For information on using iDRAC RACADM to export, import, or edit profiles see section 2.2 of the [white paper on creating and managing server configuration profiles](#). User must have appropriate privileges and perform the following:

1. Login to the iDRAC of the server for which you want to configure I/O Identity.
2. Export the configuration file — To export the file from:
  - a. NFS share — use the following command:

```
racadm get -f file.xml -t xml -l NFSSHAREIPADDRESS:/nfssharename/
```
  - b. CIFS share — use the following command:

```
racadm get -f file.xml -t xml -u cifsuser -p cifspassword -l //CIFSSHAREIPADDRESS/
```
3. Edit Configuration file — For information on attributes that you can edit to configure a particular Port or Partition to I/O identity, see Appendix A.1.
4. Import configuration file: Use command (a) if you have NFS share setup and command (b) if you have CIFS share setup.
  - a. `racadm set -f file.xml -t xml -l NFSSHAREIPADDRESS:/nfssharename/`
  - b. `racadm get -f file.xml -t xml -u cifsuser -p cifspassword -l //CIFSSHAREIPADDRESS/`

For information on exporting a server profile from CMC instead of logging into individual iDRACs, refer to the sections “Configuring Servers” and “Configuring Profile Settings Using Server Configuration Replication” in the [CMC User’s Guide](#).

After exporting the profiles, you can follow the steps highlighted in Appendix A.1.

For information on setting I/O identity values programmatically from the RACADM CLI, see `NIC.VndrConfigGroup.properties (VirtFIPMacAddr, VirtLscsiMacAddr, VirtMacAddr)` of [iDRAC8 Version 2.00 RACADM Command Line Interface Reference Guide](#) .

### 1.3.2 WSMAN

For details related to configuring I/O identity via the WSMAN interface, see the whitepaper [I/O identity “I/O identity Setup using Lifecycle Controller”](#).



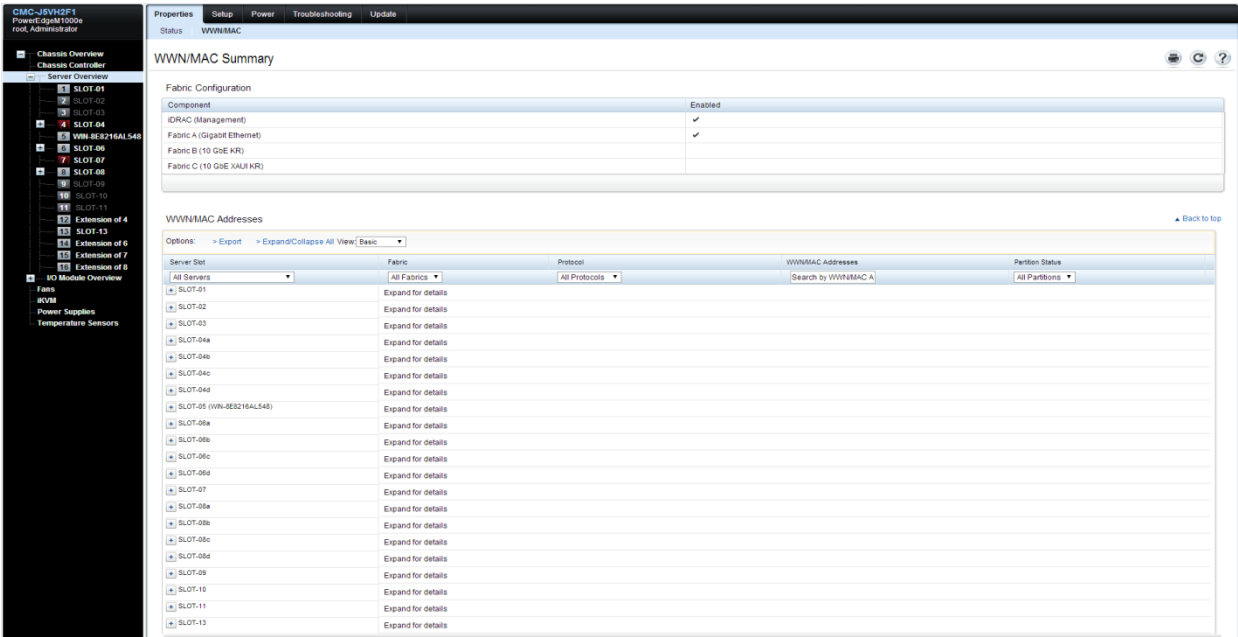


# 1.4 Centralized Management of IO Identity

The Web interface of CMC 5.0 for M1000e, CMC 2.0 for VRTX 2.0, and CMC 1.1 for FX2 enables managing Provisioned I/O identity MACs. You can determine the MAC source assignment type of a particular NIC's port or partition (server assigned, flexaddress assigned or I/O identity assigned). When applicable, the GUI displays the partition status (enabled/disabled) of port/partition. The CMC interfaces (GUI, RACADM CLI, or WSMAN API) can be used to identify source assignment type of individual port/partition.

## 1.4.1 CMC GUI

The following screen shot displays the WWN MAC Summary page of the M100e chassis with CMC 5.0 software GUI. To view I/O identity MAC addresses, navigate to Chassis Overview -> Server Overview -> Properties -> WWN/MAC.



This page displays:

- **Fabric Configuration:** A tick is displayed if the fabric is enabled, for example, iDRAC and Fabric-A fabric are enabled in the following figure:..

Fabric Configuration	
Component	Enabled
iDRAC (Management)	✓
Fabric A (Gigabit Ethernet)	✓
Fabric B (10 GbE KR)	
Fabric C (10 GbE XAUI KR)	



<Fabric>	<Type>	<Status>
A	Gigabit Ethernet	Enabled
B	10 GbE KR	Disabled
C	10 GbE XAUI+KR	Disabled
idrac	Management Controller	Enabled

- **WWN/MAC addresses:** All MAC addresses are displayed in this table, each row can expand and collapse.

WWN/MAC Addresses ▲ Back to top

Options: > Export > Expand/Collapse All View/Advanced ▼

Server Slot	Fabric	Protocol	Server-Assigned	FlexAddress (Chassis-Assigned)	IO Identity (Remote-Assigned)	Partition Status
All Servers ▼	All Fabrics ▼	All Protocols ▼	Search by WWN/MAC A	All WWN/MAC Addresses Type ▼		All Partitions ▼
+	SLOT-01	Expand for details				
+	SLOT-02	Expand for details				
+	SLOT-03	Expand for details				
+	SLOT-04a	Expand for details				
	IDRAC	Management	Not Installed	✓ F8:BC:12:AC:9F:D7	Not Installed	Unknown
	A1	Gigabit Ethernet	Not Installed	✓ F8:BC:12:AC:9F:D8	Not Installed	Unknown
	A2	Gigabit Ethernet	Not Installed	✓ F8:BC:12:AC:9F:D9	Not Installed	Unknown
	A2	Gigabit Ethernet	Not Installed	✓ F8:BC:12:AC:9F:DA	Not Installed	Unknown
	C1	Gigabit Ethernet	Not Installed	✓ F8:BC:12:AC:9F:DB	Not Installed	Unknown
	C1	10 GbE XAUI KR	Not Installed	F8:BC:12:AC:9F:E0	Not Installed	Unknown
	C1	10 GbE XAUI KR	Not Installed	F8:BC:12:AC:9F:E1	Not Installed	Unknown
	C2	10 GbE XAUI KR	Not Installed	F8:BC:12:AC:9F:E2	Not Installed	Unknown
	C2	10 GbE XAUI KR	Not Installed	F8:BC:12:AC:9F:E3	Not Installed	Unknown
+	SLOT-04b	Expand for details				
+	SLOT-04c	Expand for details				
+	SLOT-04d	Expand for details				
+	SLOT-05 (WWN: 8E3216A1548)	Expand for details				
+	SLOT-06a	Expand for details				
+	SLOT-06b	Expand for details				
+	SLOT-06c	Expand for details				
+	SLOT-06d	Expand for details				
+	SLOT-07	Expand for details				
+	SLOT-08a	Expand for details				
+	SLOT-08b	Expand for details				
+	SLOT-08c	Expand for details				
+	SLOT-08d	Expand for details				
+	SLOT-09	Expand for details				
+	SLOT-10	Expand for details				
+	SLOT-11 (WWN: 8FANS01E0C5)	Expand for details				
+	SLOT-13	Expand for details				

WWN/MAC address table comes with two views

- **Basic** : WWN/MAC address shows only active mac addresses in this table.

WWN/MAC Addresses ▲ Back to top

Options: > Export > Expand/Collapse All View/Basic ▼

Server Slot	Fabric	Protocol	WWN/MAC Addresses	Partition Status
All Servers ▼	All Fabrics ▼	All Protocols ▼	Search by WWN/MAC A	All Partitions ▼

- **Advanced:** It primarily displays MAC addresses for:
  - Server Assigned, which are the factory assigned MACs.

- WWNNMAC Addresses ▶ Back to top

Options: [Export](#) [Expand/Collapse All View](#) [Advanced ▼](#)

Server Slot	Fabric	Protocol	Server-Assigned	FlexAddress (Chassis-Assigned)	I/O Identity (Remote-Assigned)	Partition Status
All Servers ▼	All Fabrics ▼	All Protocols ▼	Search by WWNNMAC	All WWNNMAC Addresses Type ▼		All Partition ▼

WNMIMAC Addresses

Options: > Export > Expand/Collapse All View **Advanced**

Server Slot	Fabric	Protocol	Server-Assigned	FlexAddress (Chassis-Assigned)	IO Identity (Remote-Assigned)	Partition Status
SLOT-05 (▼)	All Fabrics ▼	All Protocol: ▼	Search by WNMIMAC A	Active IO Identity MAC ▼		All Partitions: ▼
[-] SLOT-05 (WNM-8E3216A1548)	A1	10 GbE KR	BC:30:5B:EF:14:BC	F8:BC:12:AC:9F:E5	✓ 11:22:22:33:11:44	Unknown
		FCoE-WWN	20:01:BC:30:5B:EF:14:BD	F0:01:F8:BC:12:AC:9F:E6	✓ 20:01:BC:30:5B:EF:14:BD	Unknown
	A2	10 GbE KR	BC:30:5B:EF:14:BE	F8:BC:12:AC:9F:E7	✓ 11:22:33:11:22:33	Unknown
		FCoE-WWN	20:01:BC:30:5B:EF:14:BF	20:01:F8:BC:12:AC:9F:E8	✓ 20:01:BC:30:5B:EF:14:BF	Unknown
	C1	FCoE-WWN	20:01:00:1B:21:BA:D4:DD	20:01:F8:BC:12:AC:9F:EE	✓ 20:01:00:1B:21:BA:D4:DD	Unknown
	C2	FCoE-WWN	20:01:00:1B:21:BA:D4:DF	20:01:F8:BC:12:AC:9F:F0	✓ 20:01:00:1B:21:BA:D4:DF	Unknown

CMC-J8V42F1  
PowerEdge R1000e  
root/Administrator

Chassis Overview  
Chassis Controller  
Server Overview

- [-] SLO1-01
- [-] SLO1-02
- [-] SLO1-03
- [-] SLO1-04
- [-] SLO1-04a
- [-] SLO1-04b
- [-] SLO1-04c
- [-] SLO1-04d
- [-] SLO1-04e
- [-] SLO1-04f
- [-] SLO1-04g
- [-] SLO1-04h
- [-] SLO1-04i
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- [-] SLO1-04k
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- [-] SLO1-04v
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- [-] SLO1-04aa
- [-] SLO1-04ab
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- [-] SLO1-04ak
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- [-] SLO1-04ij
- [-] SLO1-04ik
- [-] SLO1-04il
- [-] SLO1-04im
- [-] SLO1-04in
- [-] SLO1-04io
- [-] SLO1-04ip
- [-] SLO1-04iq
- [-] SLO1-04ir
- [-] SLO1-04is
- [-] SLO1-04it
- [-] SLO1-04iu
- [-] SLO1-04iv
- [-] SLO1-04iw
- [-] SLO1-04ix
- [-] SLO1-04iy
- [-] SLO1-04iz
- [-] SLO1-04ja



The screenshot shows the Dell Chassis Management Controller (CMC) web interface. The left sidebar displays the server overview, including slots 1-16 and I/O module overview. The main content area shows the WWN/MAC Summary page. The 'Options' section includes a red circle around the 'Export' button. The table below shows the WWN/MAC addresses for various components.

Server Slot	Fabric	Protocol	WWN/MAC Addresses	Partition Status
All Servers	All Fabrics	All Protocols	Search by WWN/MAC	All Partitions
SLOT-01	IDRAC	Management	5C:F9:DD:D6:46:0C	Unknown
SLOT-01	A1	Gigabit Ethernet	84:8F:69:FE:21:11	Unknown
		Gigabit Ethernet	84:8F:69:FE:21:13	Unknown
	A2	Gigabit Ethernet	84:8F:69:FE:21:12	Unknown
		Gigabit Ethernet	84:8F:69:FE:21:14	Unknown
	B1	10 GbE XAUI	Not Installed	Unknown
		10 GbE XAUI	Not Installed	Unknown
	B2	10 GbE XAUI	Not Installed	Unknown
		10 GbE XAUI	Not Installed	Unknown
C1	None	Not Installed	Unknown	
	None	Not Installed	Unknown	
C2	None	Not Installed	Unknown	
	None	Not Installed	Unknown	
SLOT-02a	IDRAC	Management	Not Installed	Unknown
SLOT-02a	A1	None	Not Installed	Unknown
		None	Not Installed	Unknown

## 1.4.2 CMC CLI

CMC firmware has enhanced the existing command "getmacaddress" with a new option "-c" to identify source assignment type of MAC. To identify source assignment type of MAC use:

"getmacaddress -c all|IO-Identity|Factory|FlexAddress " displays the MAC Address assignment, partition status, and additional details as displayed in the following figure:

```

1036.18 - PuTTY
$
$ getmacaddress -c all
<Name>          <Type>          <Presence>    <Active WWN/MAC>    <Partition Status> <Assignment Type>
CMC              N/A              Present       A4:BA:DB:18:A5:5A   N/A                Factory
Server-1-A       IDRAC-Controller Present       F0:1F:AF:79:33:A0   N/A                Factory
                  10 GbE KR        Present       E1:DB:55:16:F6:C4   Disabled           IO-Identity
                  10 GbE KR        Present       11:11:55:16:F6:C6   Disabled           IO-Identity
                  iSCSI            Present       E1:DB:55:16:F6:C5   Disabled           IO-Identity
                  iSCSI            Present       F0:1F:AF:79:34:73   Disabled           FlexAddress
                  FCoE-FIP         Present       E1:DB:55:16:F6:C5   Disabled           IO-Identity
                  FCoE-FIP         Present       F0:1F:AF:79:34:74   Disabled           FlexAddress
                  FCoE-WWN         Present       20:01:E1:DB:55:16:F6:C5 Unknown           IO-Identity
                  FCoE-WWN         Present       20:01:F0:1F:AF:79:34:74 Disabled           FlexAddress
                  10 GbE KR        Present       F0:1F:AF:79:34:75   Unknown           FlexAddress
                  10 GbE KR        Present       F0:1F:AF:79:34:78   Unknown           FlexAddress
                  iSCSI            Present       F0:1F:AF:79:34:76   Unknown           FlexAddress
                  iSCSI            Present       F0:1F:AF:79:34:79   Unknown           FlexAddress
                  FCoE-FIP         Present       F0:1F:AF:79:34:77   Unknown           FlexAddress
                  FCoE-FIP         Present       F0:1F:AF:79:34:7A   Unknown           FlexAddress
                  FCoE-WWN         Present       20:01:F0:1F:AF:79:34:77 Unknown           FlexAddress
                  FCoE-WWN         Present       20:01:F0:1F:AF:79:34:7A Unknown           FlexAddress
                  10 GbE KR        Present       F0:1F:AF:79:34:7B   Unknown           FlexAddress
                  10 GbE KR        Present       F0:1F:AF:79:34:7E   Unknown           FlexAddress
                  iSCSI            Present       F0:1F:AF:79:34:7C   Unknown           FlexAddress
                  iSCSI            Present       F0:1F:AF:79:34:7F   Unknown           FlexAddress
                  FCoE-FIP         Present       F0:1F:AF:79:34:7D   Unknown           FlexAddress
                  FCoE-FIP         Present       F0:1F:AF:79:34:80   Unknown           FlexAddress
                  FCoE-WWN         Present       20:01:F0:1F:AF:79:34:7D Unknown           FlexAddress
                  FCoE-WWN         Present       20:01:F0:1F:AF:79:34:80 Unknown           FlexAddress
                  10 GbE KR        Present       F0:1F:AF:79:34:81   Unknown           FlexAddress
                  10 GbE KR        Present       F0:1F:AF:79:34:84   Unknown           FlexAddress
                  iSCSI            Present       F0:1F:AF:79:34:82   Unknown           FlexAddress
                  iSCSI            Present       F0:1F:AF:79:34:85   Unknown           FlexAddress
                  FCoE-FIP         Present       F0:1F:AF:79:34:83   Unknown           FlexAddress
                  FCoE-FIP         Present       F0:1F:AF:79:34:86   Unknown           FlexAddress
                  FCoE-WWN         Present       20:01:F0:1F:AF:79:34:83 Unknown           FlexAddress
                  FCoE-WWN         Present       20:01:F0:1F:AF:79:34:86 Unknown           FlexAddress
Server-1-B       Gigabit Ethernet Present       F0:1F:AF:79:33:A5   Unknown           FlexAddress
                  Gigabit Ethernet Present       F0:1F:AF:79:33:A6   Unknown           FlexAddress

```

### 1.4.3 WSMAN Based Management

Latest schema (posted online

[http://en.community.dell.com/techcenter/extras/m/white\\_papers/20440951](http://en.community.dell.com/techcenter/extras/m/white_papers/20440951))

supported by DCIM\_MacAddrView is a new WSMAN class which provides a view of Provisioned I/O identity MACs and related information. Number of Instances returned by this class equals the number of slots in the Chassis. Sixteen instances for Dell M1000e Chassis and four instances for VRTX Chassis and FX2 Chassis for half height blades.

Class name	DCIM_MacAddrView	Number of instances equals to number of slots of chassis
Property 1	Fabric	String[].Indexed Array of Fabric Description
Property 2	ProtocolType	String[].Indexed Array of Protocol type
Property 3	WWNAndMAC	String[].Indexed Array of WWN and Mac address

Property 4	AssignmentType	Uint8[ ].Indexed Array of Assignment Type of Mac address  0 - None 1 - I/O Identity 2 - Factory 3 - Flex 4 - Unsupported Server 5 - Unsupported firmware
Property 5	PartitionStatus	Uint8[ ].Indexed Array of PartitionStatus  0 - Unknown 1 - Enabled 2 - Disabled 3 - Not Applicable
Property 6	SlotFQDD	String .The property shall have the value "System.Modular.N", where N is a single zero padded number representing the slot where a blade server is plugged into a modular chassis.

#### 1.4.3.1 Viewing Provisioned I/O identity MACs of all Chassis Slots

In the example that follows (Figure 2), a VRTX chassis and WinRM remote management client from Microsoft Windows are used to view the MACs of all the Chassis slots. Enumeration of the `DCIM_MacAddrView` class provides all instances corresponding to each Chassis slot. The `WWNAndMAC` Property of each instance associated with each slot provides the MAC address. All Array properties elements are mapped one to one. The first element of `Fabric Array`, which is `IDRAC` having Mac address which is first element of `WWNAndMAC` Array whose Partition status will be first element of `PartitionStatus` Array and assignment type will be first element of `AssignmentType` Array having protocol type as first element of property `ProtocolType` Array, Slot information provided by property `InstanceID`.



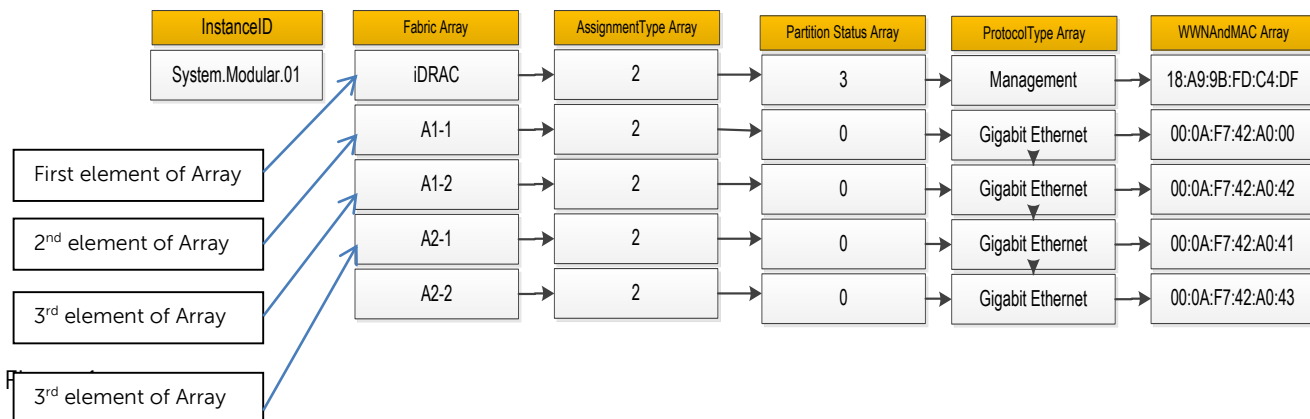


Figure 2 One to One Mapping of Array elements

```
C:\>winrm enumerate http://schemas.dmtf.org/wbem/wscim/1/cim-
schema/2/root/dell/cmcc/DCIM_MacAddrView -u:<USERNAME> -p:<PASSWORD> -
r:https://<IP_ADDRESS>/wsman -SkipCNcheck -SkipCAcheck -Skiprevocationcheck -encoding:utf-8 -
a:basic
```

#### DCIM\_MacAddrView

```
AssignmentType = 2, 2, 2, 2, 2
Fabric = iDRAC, A1-1, A1-2, A2-1, A2-2
InstanceID = System.Modular.01
PartitionStatus = 3, 0, 0, 0, 0
ProtocolType = Management, Gigabit Ethernet, Gigabit Ethernet, Gigabit Ethernet, Gigabit Ethernet
SlotFQDD = System.Modular.01
WWNAndMAC = 18:A9:9B:FD:C4:DF, 00:0A:F7:42:A0:40, 00:0A:F7:42:A0:42, 00:0A:F7:42:A0:41,
00:0A:F7:42:A0:43
```

#### DCIM\_MacAddrView

```
AssignmentType = 2, 2, 2, 2, 2
Fabric = iDRAC, A1-1, A1-2, A2-1, A2-2
InstanceID = System.Modular.02
PartitionStatus = 3, 0, 0, 0, 0
ProtocolType = Management, Gigabit Ethernet, Gigabit Ethernet, Gigabit Ethernet, Gigabit Ethernet
SlotFQDD = System.Modular.02
WWNAndMAC = 18:A9:9B:FD:C5:0D, F8:BC:12:00:AD:58, F8:BC:12:00:AD:5A, F8:BC:12:00:AD:59,
F8:BC:12:00:AD:5B
```

#### DCIM\_MacAddrView

```
AssignmentType = 3, 3, 3, 3, 3
Fabric = iDRAC, A1-1, A1-2, A2-1, A2-2
InstanceID = System.Modular.03
PartitionStatus = 3, 0, 0, 0, 0
```

```

ProtocolType = Management, Gigabit Ethernet, Gigabit Ethernet, Gigabit Ethernet, Gigabit Ethernet
SlotFQDD = System.Modular.03
WWNAndMAC = F8:DB:88:3D:9F:9A, F8:DB:88:3D:9F:9B, F8:DB:88:3D:9F:9D, F8:DB:88:3D:9F:9C,
F8:DB:88:3D:9F:9E

```

```

DCIM_MacAddrView
AssignmentType = 3, 3, 3, 3, 3, 3, 3
Fabric = iDRAC, A1-1, A1-2, A1-3, A2-1, A2-2, A2-3
InstanceID = System.Modular.04
PartitionStatus = 3, 0, 0, 0, 0, 0, 0
ProtocolType = Management, 10 GbE KR, FCoE-FIP, FCoE-WWN, 10 GbE KR, FCoE-FIP, FCoE-WWN
SlotFQDD = System.Modular.04
WWNAndMAC = F8:DB:88:3D:9F:A7, F8:DB:88:3D:9F:A8, F8:DB:88:3D:9F:A9, 20:01:F8:DB:88:3D:9F:A9,
F8:DB:88:3D:9F:AA, F8:DB:88:3D:9F:AB, 20:01:F8:DB:88:3D:9F:AB

```

### 1.4.3.2 Viewing Provisioned I/O identity MACs of a Single Chassis Slot

The above Enumeration provides the InstanceID corresponding to each slot. We can get the I/O identity MACs of each slot using a WinRM get command:

#### 1. Getting I/O identity MACs of slot1

```

C:\>winrm get http://schemas.dmtf.org/wbem/wscim/1/cim-
schema/2/root/dell/cmcd/DCIM_MacAddrView?InstanceID=System.Modular.01 -u:<USERNAME> -
p:<PASSWORD> -r:https://<IP_ADDRESS>/wsman -SkipCNcheck -SkipCAcheck -Skiprevocationcheck -
encoding:utf-8 -a:basic

```

```

DCIM_MacAddrView
AssignmentType = 2, 2, 2, 2, 2
Fabric = iDRAC, A1-1, A1-2, A2-1, A2-2
InstanceID = System.Modular.01
PartitionStatus = 3, 0, 0, 0, 0
ProtocolType = Management, Gigabit Ethernet, Gigabit Ethernet, Gigabit Ethernet, Gigabit Ethernet
SlotFQDD = System.Modular.01
WWNAndMAC = 18:A9:9B:FD:C4:DF, 00:0A:F7:42:A0:40, 00:0A:F7:42:A0:42, 00:0A:F7:42:A0:41,
00:0A:F7:42:A0:43

```

```

C:\>winrm get http://schemas.dmtf.org/wbem/wscim/1/cim-
schema/2/root/dell/cmcd/DCIM_MacAddrView?InstanceID=System.Modular.05 -u:<USERNAME> -
p:<PASSWORD> -r:https://<IP_ADDRESS>/wsman -SkipCNcheck -SkipCAcheck -Skiprevocationcheck -
encoding:utf-8 -a:basic

```

```

Fault
Code
Value = s:Sender
Subcode
Value = wsa:DestinationUnreachable
Reason
Text = key: InstanceID validation failed, error: key: InstanceID validation failed, error: key: InstanceID
validation failed, error: key: InstanceID validation failed, error: (null)

```

Error number: -2144108526 0x80338012





The client cannot connect to the destination specified in the request. Verify that the service on the destination is running and is accepting requests. Consult the logs and documentation for the WS-Management service running on the destination, most commonly IIS or WinRM. If the destination is the WinRM service, run the following command on the destination to analyze and configure the WinRM service: "winrm quickconfig".



## A Work Flow of I/O identity for Export for Server Configuration Profile

You can configure the following Virtual address attributes based on the vendor specific network adapter:

Table 1 Virtual Address Attributes of Network Adapter

Attribute	Description
VirtMacAddr	Virtual MAC Address
VirtIscsiMacAddr	Virtual iSCSI MAC Address
VirtFIPMacAddr	Virtual FIP MAC Address
VirtWWN	Virtual World Wide Node Name
VirtWWPN	Virtual World Wide Port Name

To configure the Virtual address:

1. Export the configuration file. For more information see the section "Insert the hyperlink to the section".1.3.
2. Select the network device for which you want to set up I/O identity by the Fully Qualified Device Descriptor (FQDD). The FQDD (for example, NIC.Mezzanine.2B-1-1) of the network device uniquely identifies the device.
3. Modify the MACs.
4. Import the configuration file as explained in section 1.3. to import using RACADM or the Web interface.

### A.1 Exporting or Importing Sample Configuration File

Export the configuration file as explained in the provisioning section 1.3. A part of an exported configuration file is shown below. I/O identity MACs can be configured by uncommenting the highlighted attributes and programming to the desired values. For complete reference to all the properties that can be modified, please refer to the whitepaper "[Creating and Managing Server Configuration Profiles](#)".

**Configuration File before editing without I/O identity MACs:**

```
<Component FQDD="NIC.Integrated.1-1-1">
```

```
<Attribute Name="VirtualizationMode">NONE</Attribute>
```



```
<Attribute Name="BlnkLeds">0</Attribute>
```

```
<!-- <Attribute Name="VirtMacAddr">F8:BC:12:32:AA:AA</Attribute> -->
```

```
<!-- <Attribute Name="VirtIscsiMacAddr">F8:BC:12:32:BB:BB</Attribute> -->
```

```
<!-- <Attribute Name="VirtFIPMacAddr">F8:BC:12:32:CC:CC</Attribute> -->
```

```
<!-- <Attribute Name="VirtWWN">20:00:F8:BC:12:32:CC:CC</Attribute> -->
```

```
<!-- <Attribute Name="VirtWWPN">20:01:F8:BC:12:32:CC:CC</Attribute> -->
```

#### Configuration File after editing with I/O identity MACs:

```
<Component FQDD="NIC.Integrated.1-1-1">
```

```
<Attribute Name="VirtualizationMode">NONE</Attribute>
```

```
<Attribute Name="BlnkLeds">0</Attribute>
```

```
<Attribute Name="VirtMacAddr">AA:BB:CC:DD:AA:AA</Attribute>
```

```
<Attribute Name="VirtIscsiMacAddr">BB:BB:CC:DD:BB:BB</Attribute>
```

```
<Attribute Name="VirtFIPMacAddr">CC:BB:CC:DD:CC:CC</Attribute>
```

```
<!-- <Attribute Name="VirtWWN">20:00:F8:BC:12:32:CC:CC</Attribute> -->
```

```
<!-- <Attribute Name="VirtWWPN">20:01:F8:BC:12:32:CC:CC</Attribute> -->
```

**Note:** You need not program `VirtWWPN` explicitly. Programming `VirtFIPMacAddr` configures required I/O identity MAC for VirtWWPN attribute. You can also configure the `VirtWWPN` attribute individually.

After editing the configuration file, import the file as explained in the section Server profile configuration using iDRAC, RACADM, or CMC.

## A.2 Persistence Policy Settings

I/O identity MAC addresses can be configured to be persistent across cold boot, warm reset etc. Refer to iDRAC8 Users guide, version 2.0 section related to Configuring Persistence Policy Settings.

## A.3 Clearing I/O identity MAC addresses

It is important to clear the I/O identity virtual addresses on a server when they are no longer being used to avoid duplicate addresses on the network or to just return the settings to their factory assigned values. This can be done using Server Configuration Profiles page in the Web interface or a racadm command to set them to null.

For more information refer to iDRAC8 Users guide, version 2.0 section related to NIC.VndrConfigGroup.VirtMacAd.

Below example describes setting Virtual addresses to zero using the server configuration of profiles method.

Any virtual address that is set to all zero causes the device to erase the previously set virtual address value and revert to the default permanent address set by the factory or burned in during manufacturing.

### Configuration File with I/O identity Identity MACs:

```
<Component FQDD="NIC.Integrated.1-1-1">
  <Attribute Name="VirtualizationMode">NONE</Attribute>
  <Attribute Name="BlnkLeds">0</Attribute>
  <Attribute Name="VirtMacAddr">AA:BB:CC:DD:AA:AA</Attribute>
  <Attribute Name="VirtIscsiMacAddr">BB:BB:CC:DD:BB:BB</Attribute>
  <Attribute Name="VirtFIPMacAddr">CC:BB:CC:DD:CC:CC</Attribute>
  <!-- <Attribute Name="VirtWWN">20:00:F8:BC:12:32:CC:CC</Attribute> -->
  <!-- <Attribute Name="VirtWWPN">20:01:F8:BC:12:32:CC:CC</Attribute> -->
```

### Configuration File after editing to remove I/O identity MACs:

```
<Component FQDD="NIC.Integrated.1-1-1">
  <Attribute Name="VirtualizationMode">NONE</Attribute>
  <Attribute Name="BlnkLeds">0</Attribute>
  <Attribute Name="VirtMacAddr">00:00:00:00:00:00</Attribute>
  <Attribute Name="VirtIscsiMacAddr">00:00:00:00:00:00</Attribute>
  <Attribute Name="VirtFIPMacAddr">00:00:00:00:00:00</Attribute>
  <!-- <Attribute Name="VirtWWN">20:00:F8:BC:12:32:CC:CC</Attribute> -->
```



```
<!-- <Attribute Name="VirtWWPN">20:01:F8:BC:12:32:CC:CC</Attribute> -->
```

After the above file is imported back to the server blade, iDRAC restarts the host and drops the I/O identity MACs for that particular FQDD on a network adapter.

