

# Dell® Auto-Discovery Network Setup Specification

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# Auto-Discovery Network Setup Specification

## 1 Purpose

The Dell Auto-Discovery Network Setup Specification (DCIM2003) was prepared by Dell Enterprise Product Group Engineering. The Auto-Discovery feature enables the remote provisioning of servers out-of-the-box without the need for an individual setup of every server. The information in this specification should be sufficient for a server administrator to prepare the network infrastructure for automated discovery and remote configuration. Specifically, this document describes a set of procedures that can be used for the Integrated Dell Remote Access Controller (iDRAC) service processor in the Dell server to receive an IP address of a trusted provisioning server with which it will establish communication to receive a username and password for subsequent configuration using WS-Management Web Services protocol (WS-Man) or iDRAC RACADM command line utility from a remote console. Therefore, the end goal of this set of procedures is the acquisition (discovery) of an IP address by the iDRAC service processor of a management console that is hosting a provisioning server.

## 2 Scope

The procedures described in this document detail what occurs after the power and Ethernet cables are attached to the server until the time that a management console provisioning server IP address is discovered by the server service processor (iDRAC). The document does not cover the details of remote configuration, since it occurs after the discovery phase using WS-Man or the remote RACADM command line utility for the iDRAC. An alternative to auto-discovery is to set up a static IP address and user credentials at the server for every machine in the installation. The advantage this set of procedures provides is the ability to set up a specified remote provisioning user account *without* needing to be present at *every* server. Using this procedure can also have an added benefit of populating the management console inventory systems with service tags as they are initially connected to the management network and plugged into AC power, although this is not the topic of this paper. This document specifies the first step: the discovery of a management console provisioning server IP address by a newly installed and powered Dell server.

## 3 Audience

The target audiences for this specification are the following groups:

1. Server administrators responsible for Dell server installations
2. Network administrators servicing Dell server installations

This is required information for the implementation of Auto-Discovery installations, as it describes the DHCP and DNS servers configuration requirements on either the management network or the network connected to the iDRAC service processor.

## 4 References

RFC 2782, *A DNS RR for specifying the location of services (DNS SRV)*

RFC 2131, *Dynamic Host Configuration Protocol*

RFC 1035, *Domain Names – Implementation and Specification*

RFC2132, *DHCP Options and BOOTP Vendor Extensions*

## 5 Acronyms

iDRAC – Integrated Dell Remote Access Controller

WS-Man – or WS-Management – Web Services for Management (DMTF Standard)

DMTF – Distributed Management Task Force, Inc.

DHCP – Dynamic Host Configuration Protocol

DNS – Domain Name Service

SSL – Secure Sockets Layer

## 6 Overview

The discovery of a management console (with an Auto-Discovery provisioning server) by a newly installed server consists of several alternatives. One of the following must be implemented for this feature to work:

1. The DHCP server must specify the IP address and port of the management console<sup>1</sup> in a vendor specific option (option 43) data in response to the DHCP REQUEST sent out by iDRAC.
2. The DHCP server must specify the hostname and port that will resolve to an IP address with a DNS lookup.
3. The DNS server must specify a service option `_dcimprovsrv` that specifies the hostname and port that will resolve to an IP address.
4. The DNS server must specify an IP address for a server with the following known name: `DCIMCredentialServer`.

**When a Dell® PowerEdge server is ordered with the Auto-Discovery option enabled**, the iDRAC will come from the factory with DHCP enabled and no default credentials for a remote login. Following the acquisition of an IP address for the management console provisioning server with one of the above alternatives, the iDRAC will use the discovered address to initiate a SSL connection (the handshake) that will receive a new username and password. The receipt of this username and password is the end goal of the discovery and handshake process. These credentials will be used by the remote console for subsequent configuration using WS-Man or remote RACADM. **Figure 1** illustrates the IP address discovery process that iDRAC will use to acquire the provisioning server IP address prior to attempting to setup an SSL handshake with the provisioning server.

---

<sup>1</sup> NOTE: The IP address specified is the location of a service that will respond to an SSL connection setup, and provide server WS-Man login credentials; it is intended that the remote management console with an Auto-Discovery provisioning server performs this duty. However, it is possible that a completely independent service on a different machine could fill this role.

# Discovery Process For Acquiring Provisioning Server IP Address

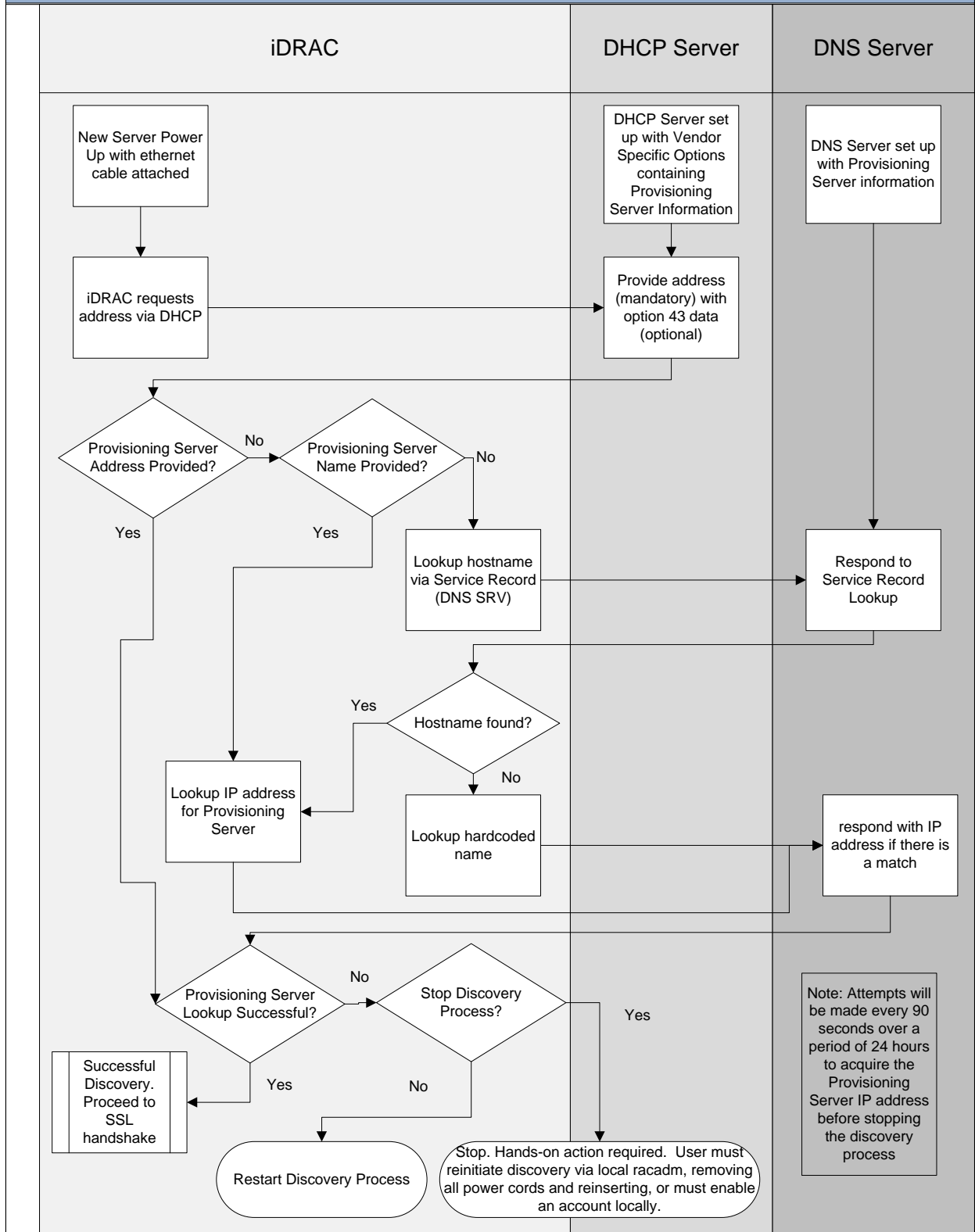


Figure 1 - Discovery of a Auto-Discovery Provisioning Server

## 7 Auto-Discovery Implementation Alternatives

If more than one discovery method is utilized simultaneously, the provisioning server address acquisition sequence is the following:

1. DHCP Vendor Scope Option
2. DNS SRV record
3. Default Host A record

### 7.1 Provide Provisioning Server information within DHCP scope options

To enable the Auto-Discovery feature, the default iDRAC NIC setting out of the box is required to be DHCP rather than statically assigned IP address. The iDRAC sets a vendor class identifier (option 60) in the DHCPREQUEST message to *LifecycleController*. This will enable DHCP servers to optionally respond uniquely to the iDRAC.

There are three possible valid responses and outcomes to the DHCPREQUEST sent by the iDRAC:

1. The request times out and an IP address is unobtainable. The iDRAC will retain its DHCP setting indefinitely with no login credentials. To change this setting a user would have to be physically present at the server. <sup>2</sup>
2. The DHCP server responds, but does not provide any option 43 data. In this case the iDRAC will attempt to locate a server via DNS (see Figure 1).
3. Option 43 data is present and includes an IP address and or hostname to use for the handshake. The data will have a format that can easily be set up on a Windows or Linux DHCP server. The sub option number for option 43 is "1" (see RFC2132) and has this format:

```
hostname( ipaddress):port
```

Where either the hostname or the ipaddress (or both) are provided, followed optionally by a port number.

The data returned by the DHCP server can be keyed off the vendor class identifier provided by iDRAC (*LifecycleController*).

#### 7.1.1 Linux DHCP Server Configuration

A dhcpd.conf file snippet for a Linux server, where the example hostname:port = "provisioning.dell.com:2800", would look like this:

---

<sup>2</sup> The iDRAC Configuration Utility using ctrl-E during boot up provides an opportunity for a static IP address and user credentials to be specified. Also, local RACADM commands can be used.

```

option space DELL;
option DELL.provsrvr code 1 = string;
class "LifecycleController" {
    match if option vendor-class-identifier = "LifecycleController";
    vendor-option-space DELL;
    option DELL.provsrvr "provisioning.dell.com:2800";
}

```

**Figure 2 – Linux DHCP Server Configuration**

### 7.1.2 Windows DHCP Server Configuration

The following figure illustrates an example DHCP Server configuration where the provisioning server is set to "provisioning.dell.com:2800".

#### **Windows Server 2003 Microsoft DHCP Version: 5.2.3790.3959 Configuration**

1. Select the server name on left tree.
2. Click **Action->Define Vendor Classes:**
  - a. Click **Add.**
  - b. Display Name : LifecycleController
  - c. Under ASCII: LifecycleController
  - d. Click **OK.**
  - e. Click **Close.**
3. Click **Action->Set Predefined Options:**
  - a. Select **LifecycleController** in Option class dropdown.
  - b. Click on **Add** for the following items:
    - Name : LifecycleController
    - Data type : String
    - Code : 1
    - Click **OK**
  - c. Click on OK
4. Expand server tree and scope.
5. Select **Scope Options** on left tree.
6. Click **Action->Configure Options:**
  - a. Click **Advanced** tab.
  - b. Select **LifecycleController** in Vendor class dropdown.
  - c. Under **Available Options**, check 001 LifecycleController.
  - d. Under String value, enter provisioning server string: for example, **provisioning.dell.com:2800**

**Figure 3 - Windows DHCP Server Configuration**

### 7.1.3 Provisioning Server DHCP scope options

It is possible that the provisioning server IP address is not statically assigned. There are several alternatives for the string value format that is used for the vendor specific option.

Examples of string values are as follows (no spaces allowed):

- **Provisioning:4433** (resolve using DNS, TCP port specified.)
- **192.168.0.125:4433** (server IP address specified for DHCP with TCP port specified.)
- **192.168.0.126** (use specified server IP address, host name is ignored, no port specified, default TCP port will be used.)
- **Provisioning,Provisioning2:4433** (resolve using DNS for both, 2<sup>nd</sup> server has TCP port specified.)
- **192.168.0.120,Provisioning2** (specified address resolved by DNS both with no TCP port specified)

## 7.2 DNS SRV

Alternatively, if the DHCP scope option discovery methodology is not desired, the iDRAC can recognize a DNS service record that specifies both the hostname and port. The iDRAC will lookup the `_DCIMProvSrv` record to determine the hostname or IP address of the Provisioning Server and the port to communicate over. See the reference RFC 2782, *A DNS RR for specifying the location of services (DNS SRV)* for relevant specifications.

### 7.2.1 Linux DNS SRV Configuration

The following is an example of a DNS server configuration file entry in Linux (`/etc/bind/pri/<primary.zone>`):

#### **Linux DNS SRV Configuration Example**

```
_DCIMProvSrv._tcp.example.com 86400 IN SRV 0 5 4433 DellProvisioningServer
```

**Figure 4 – Linux DNS SRV Configuration**

### 7.2.2 Windows DNS SRV Configuration

The following steps set up a service record on a Windows Server 2003 DNS Server Version:5.2.3790.3959 using the DNS snap-in to administer a DNS server:

### Windows Server 2003 DNS Server Version:5.2.3790.3959 Configuration

- 1) Under **Server** expand the forward lookup zone.
- 2) Select the zone listed under the zone.
- 3) Go to **Actions** (or right click).
- 4) Select **Other new records**.
- 5) For **Select a resource record type:**, select a service location (SRV).
- 6) Click on **create record**.
- 7) Enter the Domain information (tcp.dell.com).
- 8) Service type, enter **\_dcimprovsrv**.
- 9) For the protocol, leave the default of **\_tcp**
- 10) Enter a priority value where the lower the number the higher the priority; enter **1**.
- 11) Enter the weight value; if this record should be used more than another enter **90**.
- 12) Enter a port number; the default is **4433**. To use a different port number, enter it here. To use another port, it would have to be configured on the provisioning server as well.
- 13) Enter the host offering this service; enter **provisioningserver**.

**Figure 5 - Windows DNS SRV Configuration**

### **7.3 DNS server resolution of hardcoded name DCIMCredentialServer**

If the name (Host A record) DCIMCredentialServer is entered into the DNS tables, the iDRAC will request and recognize this name. This method of discovery will be iteratively attempted, along with the other provisioning server IP address discovery methodologies, every 90 seconds for 24 hours (see note in Figure 1) before timing out. Note the **\_DCIMCredentialServer** name is the last option used to locate a Provisioning Server. If the DHCP scope or DNS SRV records resolve then the DCIMCredentialServer will not be used.

## **8 Manual Configuration of iDRAC for Re-Initiating Auto-Discovery**

For testing purposes, the iDRAC Auto-Discovery process can be re-initiated by physically visiting the server and manually configuring the iDRAC. The quickest way to manually configure a system to perform Auto-Discovery is to:

1. Enter the iDRAC6 Configuration Utility by pressing CTRL-E when the server is booting and the message "Press CTRL-E for Remote Access Setup within 5 seconds...." is displayed.
2. Reset the iDRAC to factory settings
3. Set the iDRAC6 LAN Source Address to DHCP in the iDRAC6 LAN Parameter Settings
4. Enable Auto-Discovery in the iDRAC6 LAN User Configuration settings
5. Set Account Access to Disabled in the iDRAC6 LAN User Configuration Settings

This will match the settings if the iDRAC was shipped from the factory with Auto-Discovery Enabled. The following are the iDRAC6 Configuration Utility settings from the factory:

- 1) Domain Name from DHCP: On
- 2) iDRAC Source Address: DCHP

- 3) DNS Server IP Address: On
- 4) Account Access (for default “root” account): Disabled
- 5) Auto-Discovery: Enabled

These settings support the following Auto-Discovery network environments: DHCP only and DHCP with DNS. Once the server main network port (that is shared with the iDRAC) is connected into in the network where DHCP, DNS, and the Provisioning Server are accessible and AC power is connected to the system, the Auto-Discovery process will begin once the iDRAC completes its boot process. The server itself does not need to be turned on.

## 9 Advanced iDRAC Auto-Discovery Configuration

Most users will not need to configure these advanced settings for Auto-Discovery. These capabilities require one touce of the system inorder to function properly.

### 9.1 Simultaneous Auto-Discovery Methodologies

If more than one discovery methodology is utilized simultaneously, the provisioning server address acquisition sequence is the following:

- 1) Vendor Scope Option
- 2) DNS SRV record
- 3) Default Host A record.

The method selected to provision the server determines the appropriate iDRAC6 configuration utility settings (accessible during boot using Ctrl-E).

Depending upon the desired environment, the settings can be filled out in a different ways. All settings must contain valid information; the domain name and IP addresses must be accurate for their environment. No setting can be left empty for Auto-Discovery to succeed, with one exception, **DCHP Only**.

If the discovery methodology is **DHCP Only** and is using the Vendor Scope option with a Specified IP address (port optional), the only setting in the iDRAC Configuration Utility that needs to be populated is the **IP4 address DCHP**. The Domain Name and Domain Server IP settings do not need to have any information or be enabled.

### 9.2 Using Static IP addresses

It is possible to configure iDRAC to use a static IP address and then proceed with Auto-Discovery to set up user credentials. In this case, the Auto-Discovery feature becomes “one-touch” provisioning for the environment. This method might be preferred if the server administrators want to predetermine the locations and fixed IP addresses of their machines. If a static IP address is entered through the BIOS setup and iDRAC configuration screen, *and* there are no user accounts supplied, the discovery process will attempt to locate the provisioning server through DNS. If on the other hand a user account is supplied, the initial discovery and handshake becomes unnecessary, and the remote console may use these credentials for configuration using WS-Man or remote RACADM.

### 9.3 iDRAC Auto-Discovery Configuration Settings

This section covers the seven methods to configure a server based on the network environment using the four discovery implementation alternatives.

The iDRAC6 Configuration Utility settings are dependent on the provisioning method listed for the following items:

- Domain Name - On / off / manual
- iDRAC Source - DHCP / Specified
- DNS Server IP Address - On / off / manual
- Provision Server - informational input of what would be used and not used
- iDRAC6 Configuration Utility settings informational reference

For the Domain Name and DNS Server IP address settings:

- On – the field Domain Name from the DHCP or DNS Server from DHCP is set to ON.
- Off – the field Domain Name from the DHCP or DNS Server from DHCP is set to OFF.
- Manual – the fields are set to OFF, and the user has entered information manually in the other fields.

The following settings listed here are only the LAN parameter settings. The iDRAC6 LAN is required to be enabled; select the Auto-Discovery field, and disable the Root account in the LAN User section in the iDRAC6 Configuration Utility in order for Auto-Discovery to begin running. This does not apply if the feature is included in the server when it was ordered.

### 9.3.1 Auto-Discovery option from the factory

The following are the iDRAC6 Configuration Utility settings from the factory:

- 1) Domain Name from DHCP: On
- 2) iDRAC Source: DHCP
- 3) DNS Server IP Address: On
- 4) Account Access (for default “root” account): Disabled
- 5) Auto-Discovery: Enabled

These settings allow for the widest range for the administrators. It supports the following network environments: DHCP only and DHCP with DNS. The server could be provisioned by any of the 3 methods. Once the server is plugged into in the network cable and the AC power cord, the Auto-Discovery process will begin once the iDRAC completes its boot process. The server does not need to be powered on.

### 9.3.2 DHCP only using Vendor scope option with Specified IP address

The iDRAC6 Configuration Utility settings have the following fields set:

- 1) Domain Name from DHCP: OFF
- 2) iDRAC Source: DHCP
- 3) DNS Server IP Address: OFF

These settings can be configured manually with IP4 address set to DHCP, no Domain Name and no DNS Server information set. The provisioning server Vendor Scope option would have a specified IP address. DNS services are not required for this method. It will work with DNS services enabled; however, in a typical setup there would be no DNS.

### 9.3.3 DHCP w/ DNS using Vendor Scope option using Name resolution

The iDRAC6 Configuration Utility settings have the following fields set

- 1) Domain Name from DHCP: On
- 2) iDRAC Source: DHCP

- 3) DNS Server IP Address: On

All settings for the above fields would be set to DHCP, or could be manually configured; but all settings would need to be configured. The provisioning server Vendor Scope option would have a DNS Name, No SRV record, and no Default Host A record is set.

### **9.3.4 DHCP w/ DNS using SRV record**

The iDRAC6 Configuration Utility settings have the following fields set:

- 1) Domain Name from DHCP: On
- 2) iDRAC Source: DCHP
- 3) DNS Server IP Address: On

All settings for the above fields would be set to DHCP, or could be manually configured; but all fields would need to be configured. The provisioning server DNS SRV record with a fully-qualified domain name needs to be present, but there is no Vendor Scope option and no default host A record is set.

### **9.3.5 DHCP w/ DNS using Default Host A record**

The iDRAC6 Configuration Utility settings have the following fields set:

- 1) Domain Name from DHCP: On
- 2) iDRAC Source: DCHP
- 3) DNS Server IP Address: On

All settings for the above fields would be set to DHCP, or could be manually configured; but all fields would need to be configured. The provisioning server has a default host, but no Vendor Scope option. A record and DNS SRV are not set.

### **9.3.6 DNS only using SRV record**

The iDRAC6 Configuration Utility settings have the following fields set:

- 1) Domain Name from DHCP: Manually set (ex. domainname.com)
- 2) iDRAC Source: 192.168.0.120
- 3) DNS Server IP Address: Manually set (ex. 192.168.0.2)

All settings for the above fields would need to be manually set to complete configuration for Auto-Discovery. The provisioning server has no DHCP services running, no Vendor Scope option, and no default host. A record is set.

### **9.3.7 DNS only using Default Host A record**

The iDRAC6 Configuration Utility settings have the following fields set:

- 1) Domain Name from DHCP: Manually set (ex. domainname.com)
- 2) iDRAC Source: 192.168.0.120
- 3) DNS Server IP Address: Manually set (ex. 192.168.0.2)

All settings for the above fields would need to be manually set to complete configuration for Auto-Discovery. The provisioning server has no DHCP services running, no Vendor Scope option, and no SRV record are set up.

## 10 Trouble Shooting Auto-Discovery

### 10.1 Without Physical Access to the System/iDRAC

#### 10.1.1 Verify DHCP Lease

Verify the idrac got a DHCP lease on the DCHP server. Refer to the documentation or help information available for the DHCP server being used for the specific steps to check what IP addresses are leased out to which MAC addresses.

#### 10.1.2 Verify DNS Entries

Verify the DNS entries on the DNS server. If DHCP is not being used and a hostname is specified in the SNS Serve Record, make sure the hostname is resolvable using ping or nslookup.

When using nslookup, if SRV is being used:

```
nslookup
>set type=srv
>_dcimprovsrv._tcp.<yourdomain>.com
```

If the default hostname “DCIMCredentialServer” is being used, make sure the DNS entry is resolvable.

```
nslookup DCIMCredentialServer.<yourdomain>.com
```

#### 10.1.3 Checking the iDRAC RACLOG

The iDRAC RACLOG can be accessed via the iDRAC remote Graphical User Interface(GUI) or the remote racadm command line utility. See the iDRAC6 User Guide for instructions on how to view the RACLOG using the iDRAC GUI. To access the RACLOG using the remote racadm utility, invoke the “racadm getraclog” command (see the iDRAC6 Users Guide for details on invoking this command) and check the Auto-Discovery related messages. See the section 10.3 iDRAC RACLOG Auto-Discovery Related Error Messages for a complete listing of Auto-Discovery related messages, more detailed descriptions of the conditions that caused the messages to be generated, and recommended response actions.

#### 10.1.4 Checking the iDRAC Trace Log

Invoke the “racadm gettracelog” command (see the iDRAC6 Users Guide for details on invoking this command) and check the Auto-Discovery related messages. See the section 10.4 iDRAC Trace Log Auto-Discovery Related Messages for a complete listing of Auto-Discovery related messages, more detailed descriptions of the conditions that caused the messages to be generated, and recommended response actions.

An example of Auto-Discovery related Trace Log messages is as follows:

```
Record: 11
Date/Time: Sep 16 13:36:04 2009
Source: iDRAC- idrac_discovery: [2968 INFO]
Description: Parsing vendor options
```

The iDRAC Auto-Discovery client messages are marked by the Source field values of “iDRAC-idrac\_discovery” followed by the client identifier and type of message in square brackets. The type of message can be INFO, WARNING, ERROR, or CRITICAL. The Description field is the message. When trouble shooting the Auto-Discovery process, look for messages of type WARNING and ERROR.

The following example shows the tracelog messages from the iDRAC discovery client when it successfully acquires a Provisioning Server hostname (in this case “winprovisioning”) from DHCP vendor option and sets up a SOAP/SSL connection with the Provisioning Server.

```
Record: 32
Date/Time: Sep 16 13:37:38 2009
Source: iDRAC- idrac_discovery: [2968 INFO]
Description: Looking for PS info in DHCP.
-----
Record: 33
Date/Time: Sep 16 13:37:38 2009
Source: iDRAC- idrac_discovery: [2968 INFO]
Description: Getting vendor options from DHCP.
-----
Record: 34
Date/Time: Sep 16 13:37:38 2009
Source: iDRAC- idrac_discovery: [2968 INFO]
Description: eth0 ip unset
-----
Record: 35
Date/Time: Sep 16 13:37:38 2009
Source: iDRAC- idrac_discovery: [2968 INFO]
Description: eth0 ip set 192.168.1.16 255.255.255.0
-----
Record: 36
Date/Time: Sep 16 13:37:38 2009
Source: iDRAC- idrac_discovery: [2968 INFO]
Description: Invalid gateway 0.0.0.0. Gateway not set
-----
Record: 37
Date/Time: Sep 16 13:37:38 2009
Source: iDRAC- idrac_discovery: [2968 INFO]
Description: Parsing vendor options
-----
Record: 38
Date/Time: Sep 16 13:37:38 2009
Source: iDRAC- idrac_discovery: [2968 INFO]
Description: PS info string: winprovisioning
-----
Record: 39
Date/Time: Sep 16 13:37:38 2009
Source: iDRAC- idrac_discovery: [2968 INFO]
Description: Resolving hostname winprovisioning globally
-----
Record: 40
Date/Time: Sep 16 13:37:38 2009
Source: iDRAC- idrac_discovery: [2968 INFO]
Description: Hostname: winprovisioning
-----
Record: 41
Date/Time: Sep 16 13:37:38 2009
Source: iDRAC- idrac_discovery: [2968 INFO]
Description: IP Addr: 192.168.1.2 Resolved
-----
Record: 42
Date/Time: Sep 16 13:37:38 2009
Source: iDRAC- idrac_discovery: [2968 INFO]
Description: Port: 4433 (Default)
-----
Record: 43
Date/Time: Sep 16 13:37:38 2009
Source: iDRAC- idrac_discovery: [2968 INFO]
```

Description: Hostname winprovisioning for addrinfo search.  
-----  
Record: 44  
Date/Time: Sep 16 13:37:38 2009  
Source: iDRAC- idrac\_discovery: [2968 INFO]  
Description: getaddrinfo success with hostname winprovisioning  
-----  
Record: 45  
Date/Time: Sep 16 13:37:38 2009  
Source: iDRAC- idrac\_discovery: [2968 INFO]  
Description: IPv4: addr 192.168.1.2, length: 16  
-----  
Record: 46  
Date/Time: Sep 16 13:37:38 2009  
Source: iDRAC- idrac\_discovery: [2968 INFO]  
Description: Trying <https://winprovisioning:4433>  
-----  
Record: 47  
Date/Time: Sep 16 13:37:38 2009  
Source: iDRAC- idrac\_discovery: [2968 INFO]  
Description: Initializing SOAP.  
-----  
Record: 48  
Date/Time: Sep 16 13:37:38 2009  
Source: iDRAC- idrac\_discovery: [2968 INFO]  
Description: Setting up Soap SSL context using default cert and CA file.  
-----

The following example shows the tracelog messages from the iDRAC discovery client when it successfully sets up a SOAP/SSL connection with the Provisioning Server, acquires and sets username and password data, and sets up an admin account.

-----  
Record: 177  
Date/Time: Sep 16 16:35:51 2009  
Source: iDRAC- idrac\_discovery: [3489 INFO]  
Description: Connection string: <https://192.168.1.2:4433>  
-----  
Record: 178  
Date/Time: Sep 16 16:35:51 2009  
Source: iDRAC- idrac\_discovery: [3489 INFO]  
Description: Making SOAP call.  
-----  
Record: 179  
Date/Time: Sep 16 16:36:31 2009  
Source: iDRAC- idrac\_discovery: [3489 INFO]  
Description: SOAP call succeeded.  
-----  
Record: 180  
Date/Time: Sep 16 16:36:31 2009  
Source: iDRAC- idrac\_discovery: [3489 INFO]  
Description: Create/update account - username: ganesh  
-----  
Record: 181  
Date/Time: Sep 16 16:36:41 2009  
Source: iDRAC- idrac\_discovery: [3489 INFO]  
Description: Setting User Password 3  
-----  
Record: 182  
Date/Time: Sep 16 16:36:41 2009  
Source: iDRAC- idrac\_discovery: [3489 INFO]  
Description: Enabling account: 3.  
-----  
Record: 183  
Date/Time: Sep 16 16:36:42 2009  
Source: iDRAC- idrac\_discovery: [3489 INFO]  
Description: Setting admin privilege: 3.  
-----  
Record: 184

Date/Time: Sep 16 16:36:43 2009  
Source: iDRAC- idrac\_discovery: [3489 INFO]  
Description: D&H disabled

Record: 185  
Date/Time: Sep 16 16:36:43 2009  
Source: iDRAC- idrac\_discovery: [3489 INFO]  
Description: Cleaning up resources.

## 10.2 With Physical Access to the System/iDRAC

### 10.2.1 Checking iDRAC Configuration Settings

- 1) Reboot the system and enter CTRL-E during the system boot when the “Press CTRL-E for Remote Access Setup within 5 seconds....“ message appears to enter the iDRAC Configuration Utility.
- 2) Make sure the Auto-Discovery setting is Enabled and Account Access setting is Disabled. The following screenshot depicts the iDRAC Configuration settings needed.

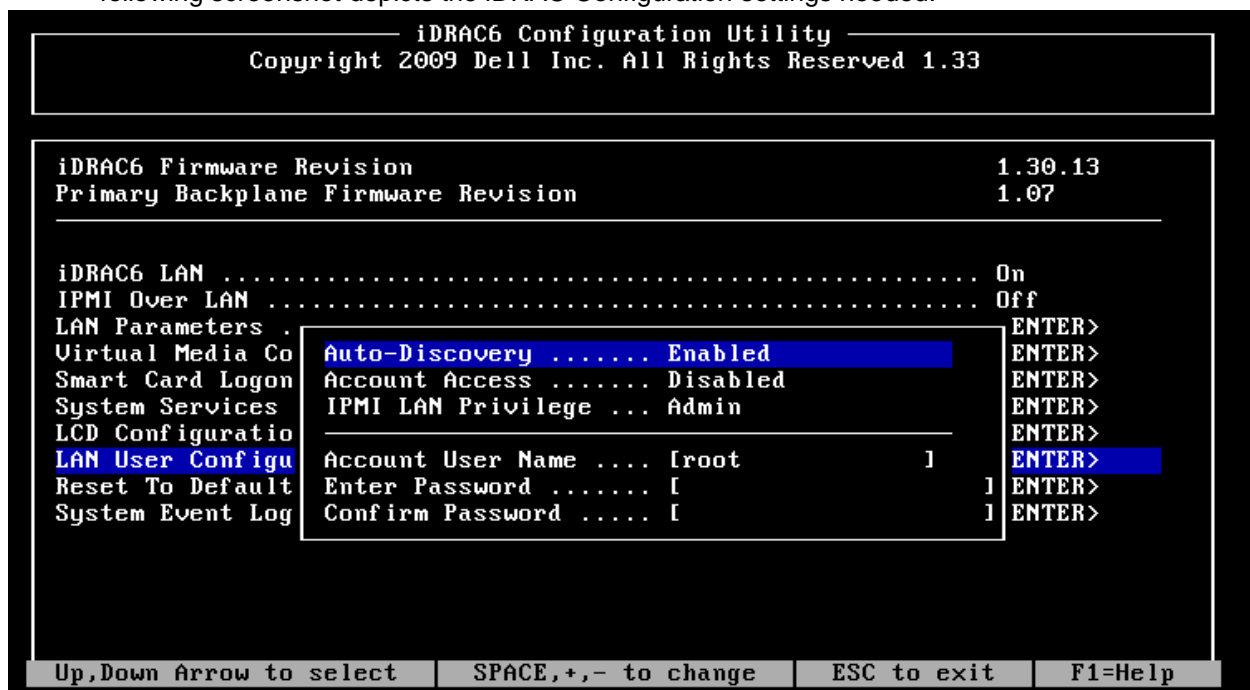


Figure 6 – iDRAC Configuration Utility – LAN User Configuration Screen Shot

- 3) Check that the iDRAC has an IP address leased from DHCP. The following screenshot depicts the iDRAC Configuration Utility settings needed.

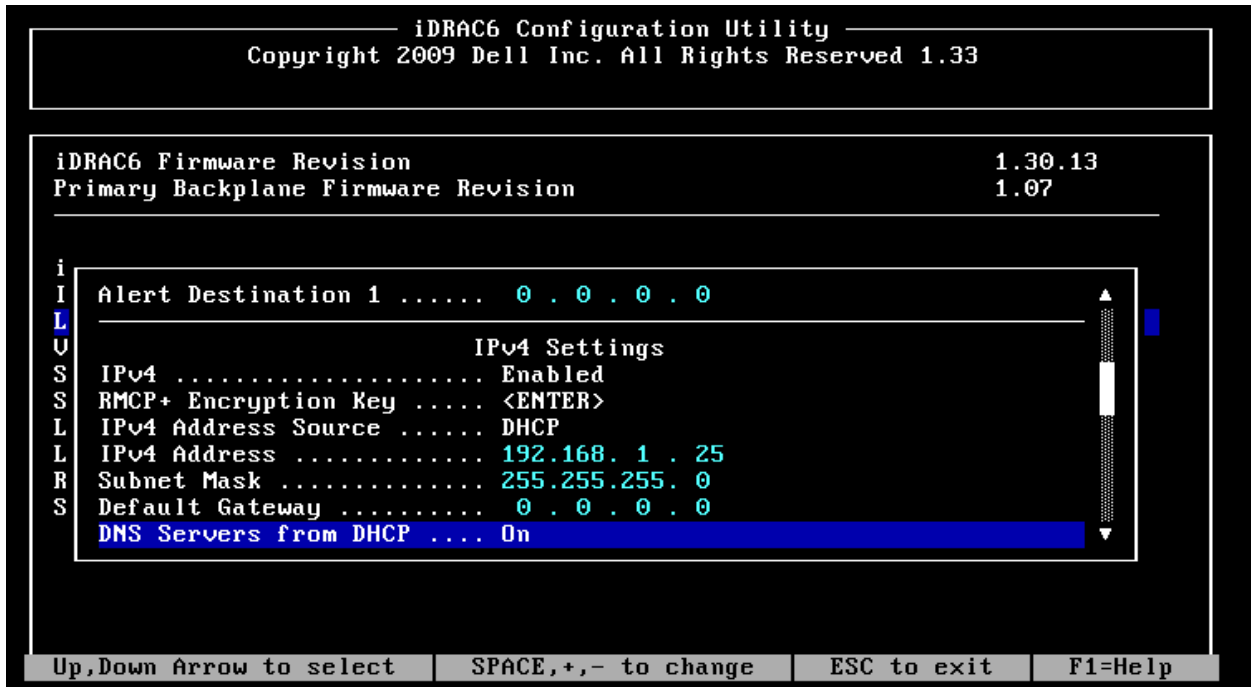


Figure 7 – iDRAC Configuration Utility – Lan Parameters Screen Shot

### 10.3 iDRAC RACLOG Auto-Discovery Related Error Messages

| Message   | Criticality | Detailed Description  | Recommended Action   |
|---|-------------|---|--|
| failed to unset <b>interface ip</b>                     | INFO        | Process failed to unset the interface IP address before making the DHCP request.            | None. Process will retry.  |
| failed <b>interface ip</b> set <b>ipAddress netMask</b> | INFO        | Process failed to reset the interface IP address and netmask after making the DHCP request. | None. Process will retry.  |
| failed <b>defaultGatewaySetCommand</b>                  | INFO        | Process failed to reset the default gateway after making the DHCP request.                  | None. Process will retry.  |
| failed to renew ip                                      | INFO        | Attempt to renew the DHCP lease failed.   | If the Auto-Discovery process failed to download iDRAC credential, check the network DHCP settings and try Auto-Discovery again. |
| ip renewed started                                      | INFO        | Attempt to renew the DHCP lease succeeded.  | None.  |
| Updating user <b>username</b>                           | INFO        | Updating the username in iDRAC.   | None.  |
| Adding username: <b>slot# username</b>                  | INFO        | Adding the username in the slot indicated by slot# in                                       | None.  |

| iDRAC.  |       |   |  |
|---|-------|---|--|
| Add username<br><b>username</b> FAILED!!!                       | INFO  | Failed to add username in iDRAC.  | Try Auto-Discovery again and if it fails, call Dell Support.   |
| IPMISetUserName <b>slot#</b><br><b>username</b>                 | INFO  | Adding the username in the slot indicated by slot# in iDRAC.                  | None.  |
| IPMISetUserName failed:<br><b>username</b>                      | INFO  | Failed to add username in iDRAC.  | Try Auto-Discovery again and if it fails, call Dell Support.   |
| No space available to add user.                                 | INFO  | All 16 username slots are used; no empty slot to add the new user.            | Make sure that there is an empty username slot and try Auto-Discovery again.                                   |
| Set password for<br><b>username</b> FAILED!!!                   | INFO  | Internal RACADM error to set the password for the user.                       | Try Auto-Discovery again and if it fails, call Dell Support  |
| IPMISetUserPassword for<br><b>username</b> failed               | INFO  | Internal RACADM error to set the password for the user.                       | Try Auto-Discovery again and if it fails, call Dell Support.   |
| iDRAC Discovery<br><b>version</b>                               | INFO  | Information about the Auto-Discovery version.                                 | None.  |
| Discovery and Handshake disabled.                               | INFO  | Information about the Auto-Discovery feature being disabled.                  | Enable the Auto-Discovery feature via iDRAC Configuration Utility if attempt to run Auto-Discovery is desired. |
| Auto-Discovery successful, disabling Auto-Discovery for future. | INFO  | Auto-Discovery is complete and successful - disabling the feature.            | None.  |
| Disabling Auto-Discovery failed.                                | INFO  | Failed to disable the Auto-Discovery feature.                                 | Disable the Auto-Discovery feature via iDRAC Configuration Utility.  |
| Handshake successful for<br><b>hostname</b>                     | INFO  | Information about successful handshake with the provisioning server hostname. | None.  |
| SIGTERM caught, exiting.  | INFO  | User input to terminate the Auto-Discovery process                            | None.  |
| SIGUSR1 caught, waking up.                                      | INFO  | Wake up Auto-Discovery client program from sleep.                             | None.  |
| SIGPIPE caught, breaking SSL pipe.                              | INFO  | SIGPIPE was encountered during SSL connection.                                | None.  |
| ERROR: PS info string malloc error.                             | ERROR | Fatal Error: Internal memory.   | Reboot iDRAC and if it happens again, call Dell Support.   |
| ERROR: Unable to create udhcpc script file.                     | ERROR | Fatal Error: Internal file system.  | Reboot iDRAC and if it happens again, call Dell Support.   |
| ERROR: Udhcpc malloc error.                                     | ERROR | Fatal Error: Internal memory.   | Reboot iDRAC and if it happens again, call Dell Support.   |
| ERROR: Hostnamedot malloc error                                 | ERROR | Fatal Error: Internal memory.   | Reboot iDRAC and if it happens again, call Dell Support.   |

|   |       |   |  |
|---|-------|---|--|
| ERROR: res_init() error                           | ERROR | Fatal Error: Internal library.  | Reboot iDRAC and if it it happens again, call Dell Support.                  |
| ERROR: PS info string realloc error.              | ERROR | Fatal Error: Internal memory.   | Reboot iDRAC and if it it happens again, call Dell Support.                  |
| ERROR: PS info string malloc error.               | ERROR | Fatal Error: Internal memory.   | Reboot iDRAC and if it it happens again, call Dell Support.                  |
| ERROR: Process is already running.                | ERROR | An Auto-Discovery process is already running.                               | None.  |
| ERROR: Giving up Auto-Discovery, timed out.       | ERROR | Auto-Discovery could not complete successfully after retrying for 24 hours. | Check the Auto-discovery Network Setup Specification to verify the settings. |
| ERROR: PS info string 2 malloc error.             | ERROR | Fatal Error: Internal memory.   | Reboot iDRAC and if it it happens again, call Dell Support.                  |
| ERROR: get_command_output( ) malloc error.        | ERROR | Fatal Error: Internal memory.   | Reboot iDRAC and if it it happens again, call Dell Support.                  |
| ERROR: get_command_output( ) adjust malloc error. | ERROR | Fatal Error: Internal memory.   | Reboot iDRAC and if it it happens again, call Dell Support.                  |
| ERROR: PS_INFO malloc error.                      | ERROR | Fatal Error: Internal memory.   | Reboot iDRAC and if it it happens again, call Dell Support.                  |
| ERROR: PS info array realloc error.               | ERROR | Fatal Error: Internal memory.   | Reboot iDRAC and if it it happens again, call Dell Support.                  |
| ERROR: conn_str malloc error.                     | ERROR | Fatal Error: Internal memory.   | Reboot iDRAC and if it it happens again, call Dell Support.                  |

## 10.4 iDRAC Trace Log Auto-Discovery Related Messages

| Message                                   | Criticality | Detailed Description  | Recommended Action  |
|---|-------------|---|---|
| Looking for PS info in DHCP               | INFO        | Looking for PS info in DHCP.  | None.   |
| No vendor options found in DHCP.          | INFO        | No vendor options found in DHCP.  | None.   |
| Parsing vendor options                    | INFO        | Parsing vendor options.   | None.   |
| Vendor options length <b>len &gt; max</b> | INFO        | The received vendor option data has a length greater than the maximum allowed . | Check the setting in DHCP and make sure the vendor option data are within bounds. |
| PS info string: <b>string</b>             | INFO        | The vendor option string received.  | None.   |
| Getting vendor options from DHCP.         | INFO        | Getting vendor options from DHCP.   | None.   |
| <b>interface</b> ip unset                 | INFO        | The interface IP address has been unset before making DHCP request              | None.   |

|  |      |   |   |
|--|------|---|---|
| <b>interface</b> ip set<br><b>ipAddress netmask</b>                  | INFO | The interface IP address and netmask have been reset after making DHCP request                | None.   |
| gateway set <b>hostname</b>  | INFO | The default gateway has been reset after making DHCP request                                  | None.   |
| Resolving hostname globally.   | INFO | Trying to resolve a hostname globally.  | None.   |
| Could not resolve hostname globally, trying in my domain.            | INFO | Could not resolve hostname globally, trying in currently configured domain.                   | None.   |
| Could not resolve hostname in my domain.                             | INFO | Could not resolve hostname in currently configured domain.                                    | If the hostname should be resolvable, please cross check the DNS and DHCP settings. |
| Get PS information string from DNS SRV: Set maximum buffer size 1024 | INFO | Added for buffer boundary check.  | None.   |
| Looking for global DNS SRV entries for <b>name</b>                   | INFO | Trying to resolve Provisioning Server name using global DNS SRV entries from the DNS service. | None.   |
| Trying for my domain.  | INFO | Trying service for my domain.   | None.   |
| No domain name found.  | INFO | No domain name found when trying service for my domain.                                       | Check the Auto-discovery Network Setup Specification to verify the settings.        |
| Domain name <b>name</b>  | INFO | Domain name found when trying service for my domain.  | None.   |
| Not a DNS response.  | INFO | Ill-formated DNS response.  | Check DNS settings.   |
| Non zero opcode.   | INFO | The DNS response received is not for a standard query.  | Check DNS settings.   |
| Non zero reply code.   | INFO | The DNS response received does not have zero as the reply code.                               | Check DNS settings.   |
| No answer sections.  | INFO | The DNS response received does not have an answer section.                                    | Check DNS settings.   |
| qt_count: <b>number</b>  | INFO | Vlaue of qt_count in the DNS response header.   | None.   |
| Buffer boundary reached in DNS header answer sections processing.    | INFO | The DNS response received contains answer sections longer than the buffer allocated.          | Check DNS settings.   |
| ans_count: <b>number</b>   | INFO | Value of ans_count in the DNS response header.  | None.   |
| MAXDNAME: <b>number</b>  | INFO | Debug information.  | None.   |

|  |      |  |  |
|--|------|--|--|
| No first hostname found in DNS SRV packet.                     | INFO | No first hostname found in DNS SRV packet.   | Check DNS settings.                                      |
| Buffer boundary reached in DNS header answer count processing. | INFO | Buffer boundary reached in DNS header answer count processing.                       | Check DNS settings.                                      |
| Not a DNS SRV entry in answer.                                 | INFO | Not a DNS SRV entry in answer.   | Check DNS settings.                                      |
| No DNS SRV found for my domain.                                | INFO | No DNS SRV found for my domain.  | Check DNS settings.                                      |
| retVal = <b>number</b> , errno = <b>number</b>                 | INFO | Debug information.   | None.  |
| failed to fork   | INFO | Failed to fork a child process.  | Reboot iDRAC and try Auto-Discovery again.               |
| child process exit failed                                      | INFO | Failed to exit the child process.  | Reboot iDRAC and try Auto-Discovery again.               |
| timeout set to <b>number</b> sec                               | INFO | The retry interval has been set to the numbers of seconds in the configuration file. | None.  |
| psinfo set to <b>string</b>                                    | INFO | Provisioning Server string has been set in the configuration file.                   | None.  |
| Failed to open PF_INET socket                                  | INFO | Failed to open socket when looking up IP address for the interface.                  | Reboot iDRAC and try Auto-Discovery again.               |
| failed to get default gw                                       | INFO | Failed to get default gateway.   | Reboot iDRAC and try Auto-Discovery again.               |
| Using interface(IP address, netmask) gw=gateway                | INFO | Debug information.   | None.  |
| Active Directory enabled                                       | INFO | Active Directory is enabled on iDRAC.  | Disable Active Directory in order to run Auto-Discovery. |
| Active Directory disabled                                      | INFO | Active Directory is disabled on iDRAC.   | None.  |
| Looking for enabled admin account.                             | INFO | Looking for enabled admin account.   | None.  |
| Setting User Password <b>slot#</b>                             | INFO | Setting the password for the user in Slot <b>slot#</b> .                             | None.  |
| IPMISetUserPassword <b>slot#</b>                               | INFO | Setting the password for the user in Slot <b>slot#</b> .                             | None.  |
| Enabling account: <b>slot#</b>                                 | INFO | Enabling the user in Slot <b>slot#</b> .   | None.  |
| Setting admin privilege: <b>slot#</b>                          | INFO | Setting the privilege for the user in Slot <b>slot#</b> .                            | None.  |

|   |      |   |   |
|---|------|---|---|
| error <b>number</b><br>remove( <b>file</b> )                                    | INFO | Error in disabling the Auto-Discovery feature.  | Reboot iDRAC and try to disable Auto-Discovery again via iDRAC Configuration Utility.                             |
| D&H disabled  | INFO | Auto-Discovery is successfully disabled.  | None.   |
| Disabling root account.<br>touching file <b>file</b>                            | INFO | Debug information.  | None.   |
| RUNNING TORTURE<br>MODE   | INFO | Debug information.  | None.   |
| sysinfo failed - <b>errorNo</b>   | INFO | Failed to get the system info.  | The system retry timeout mechanism might not work correctly; if Auto-Discovery fails, reboot iDRAC and try again. |
| start time= <b>time</b>   | INFO | Successfully getting the start time from the system info.                                     | None.   |
| Handshake failed for all PS, sleeping <b>number</b> seconds.                    | INFO | Handshake failed and the process sleeps before retry.   | Check the Auto-discovery Network Setup Specification to verify the settings.                                      |
| Cleaning up resources.<br><b>number</b> sec before D&H timeout now= <b>time</b> | INFO | Debug information.<br>Information about remaining time till Auto-Discovery gives up retrying. | None.   |
| No DNS server information available.  | INFO | No DNS server information available.  | Check the Auto-discovery Network Setup Specification to verify the DNS settings.                                  |
| No provisioning server info found, sleeping <b>number</b> seconds.              | INFO | No provisioning server info is found from either DHCP or DNS.                                 | Check the Auto-discovery Network Setup Specification to verify the settings.                                      |
| Trying<br>https: <b>hostname:port</b>   | INFO | Establishing an SSL connection with the hostname at port.                                     | None.   |
| Handshake failed for<br><b>hostname</b>   | INFO | Handshake failed.   | Check the Auto-discovery Network Setup Specification to verify the provisioning server settings.                  |
| Hostname: <b>name</b>   | INFO | Name of the Provisioning Server found.  | None.   |
| IP Addr: <b>address</b>   | INFO | IP address of the Provisioning Server found.  | None.   |
| Port: <b>number</b>   | INFO | Port number of the Provisioning Server found.   | None.   |
| Initializing SOAP.  | INFO | Debug information.  | None.   |
| Setting up Soap SSL context using default certificate.                          | INFO | Debug information.  | None.   |

|   |         |   |   |
|---|---------|---|---|
| Setting up Soap SSL context.  | INFO    | Debug information.                                      | None.   |
| Error initializing Soap SSL context.  | INFO    | Failed to initialize SSL on iDRAC.                      | Call Dell Support.  |
| Service tag: <b>string</b>  | INFO    | Found System service tag.                               | None.   |
| Creating connection string.   | INFO    | Debug information.                                      | None.   |
| Connection string: <b>string</b>  | INFO    | Debug information.                                      | None.   |
| Making SOAP call.   | INFO    | Debug information.                                      | None.   |
| SOAP call succeeded.  | INFO    | Debug information.                                      | None.   |
| Create/update account - username: <b>string</b>                             | INFO    | Successfully created/updated the user account on iDRAC. | None.   |
| Error calling getCredentials() on specified provisioning server.            | INFO    | Handshake failed with the Provisioning Server.          | Make sure that the Provisioning Server is running the correct version of software.        |
| WARN: Enabled admin account already exists, sleeping <b>number</b> seconds. | WARNING | Enabled admin account already exists.                   | If Auto-Discovery is desired, disable all admin accounts via iDRAC Configuration Utility. |
| WARN: NIC is not enabled on system, sleeping <b>number</b> seconds.         | WARNING | NIC is not enabled on system.                           | If Auto-Discovery is desired, enable NIC via iDRAC Configuration Utility.                 |
| WARN: IPv4 is not enabled on system, sleeping <b>number</b> seconds.        | WARNING | IPv4 is not enabled on system.                          | If Auto-Discovery is desired, enable IPv4 via iDRAC Configuration Utility.                |
| WARN: IPv6 is enabled on system, sleeping <b>number</b> seconds.            | WARNING | IPv6 is enabled on system.                              | If Auto-Discovery is desired, disable IPv6 via iDRAC Configuration Utility.               |
| WARN: No network connection available, sleeping <b>number</b> seconds.      | WARNING | No network connection available.                        | If Auto-Discovery is desired, deploy IP settings via iDRAC Configuration Utility.         |
| ERROR: get_command_output() failed for <b>command</b>                       | ERROR   | Internal error.   | Reboot iDRAC and try Auto-Discovery again.  |
| ERROR: failed to get system service tag.                                    | ERROR   | Failed to get system service tag.                       | Call Dell Support.  |