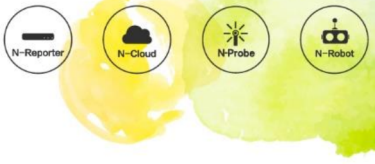
N-Partner

如何設定
Oracle 資料庫審核記錄

V010

2025/03/14



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前言

本文件描述 N-Reporter 使用者在 Linux/ AIX 如何啟用資料庫審核，並使用 Rsyslog 或 Syslogd 方式設定 Oracle DataBase Audit Logs。

在 Windows 如何使用 Open Source 工具 NXLog 方式設定 Oracle audit 事件紀錄。

NXLog 工具將 Oracle audit 事件紀錄轉成 syslog，再傳送到 N-Reporter 做正規化、稽核與分析。

Oracle Security Guide:https://docs.oracle.com/en/database/oracle/oracle-database/19/dbseg/introduction-to-auditing.html#GUID-94381464-53A3-421B-8F13-BD171C867405

Oracle Audit Syslog Level:https://docs.oracle.com/en/database/oracle/oracle-database/19/refrn/AUDIT_SYSLOG_LEVEL.html#GUID-EBBAD1D4-A4F8-49A4-9C4E-7CF6A085CB53

註：本文件僅做為如何將日誌吐出的設定參考，建議您仍應聯繫設備或是軟體原廠尋求日誌輸出方式之協助。

1 Red Hat

1.1 Red Hat 6

1.1.1 設定 Oracle Audit

(1) 切換 oracle 帳號

```
# su - oracle
```

(2) 登入 Oracle 資料庫

```
$ sqlplus / as sysdba
```

(3) 顯示審計參數

```
SQL> show parameter audit
```

(4) 顯示資料庫審計

```
SQL> show parameter audit_trail
```

(5) 顯示審計等級

```
SQL> show parameter audit_syslog_level
```

(6) 顯示 sysdba 特權用戶審計

```
SQL> show parameter audit_sys_operations
```

(7) 修改審計記錄到作業系統

```
SQL> alter system set audit_trail='OS' scope=spfile;
```

(8) 啟用 sysdba 特權用戶審計

```
SQL> alter system set audit_sys_operations=true scope=spfile;
```

(9) 修改審計紀錄 facility: local0 info 訊息

```
SQL> alter system set audit_syslog_level=local0.info' scope=spfile;
```

(10) 停止 Oracle 資料庫服務

```
SQL> shutdown immediate
```

(11) 啟動 Oracle 資料庫服務

```
SQL> startup
```

(12) 顯示審計參數

```
SQL> show parameter audit
```

(13) 離開 Oracle 資料庫

```
SQL> exit
```

1.1.2 設定 Rsyslog

(1) 編輯 Rsyslog 設定檔

```
# vi /etc/rsyslog.conf
```

(2) 將 Oracle log 傳送到 N-Reporter

```
# Send Oracle log to N-Reporter
local0.*                                @192.168.3.88
```

紅色文字部位請輸入 N-Reporter 系統 IP address

(3) 重啟 Rsyslog 服務和確認 Rsyslog 服務情形

```
# service rsyslog restart && service rsyslog status
```

1.2 Red Hat 7

1.2.1 設定 Oracle Audit

(1) 切換 oracle 帳號

```
# su - oracle
```

(2) 登入 Oracle 資料庫

```
$ sqlplus / as sysdba
```

(3) 顯示審計參數

```
SQL> show parameter audit
```

(4) 顯示資料庫審計

```
SQL> show parameter audit_trail
```

(5) 顯示審計等級

```
SQL> show parameter audit_syslog_level
```

(6) 顯示 sysdba 特權用戶審計

```
SQL> show parameter audit_sys_operations
```

(7) 修改審計記錄到作業系統

```
SQL> alter system set audit_trail='OS' scope=spfile;
```

(8) 啟用 sysdba 特權用戶審計

```
SQL> alter system set audit_sys_operations=true scope=spfile;
```

(9) 修改審計紀錄 facility: local0 info 訊息

```
SQL> alter system set audit_syslog_level=local0.info' scope=spfile;
```

(10) 停止 Oracle 資料庫服務

```
SQL> shutdown immediate
```

(11) 啟動 Oracle 資料庫服務

```
SQL> startup
```

(12) 顯示審計參數

```
SQL> show parameter audit
```

(13) 離開 Oracle 資料庫

```
SQL> exit
```

1.2.2 設定 Rsyslog

(1) 編輯 Rsyslog 設定檔

```
# vi /etc/rsyslog.conf
```

(2) 將 Oracle log 傳送到 N-Reporter

```
# Send Oracle log to N-Reporter
local0.*                                @192.168.3.88
```

紅色文字部位請輸入 N-Reporter 系統 IP address

(3) 重啟 Rsyslog 服務和確認 Rsyslog 服務情形

```
# systemctl restart rsyslog && systemctl status rsyslog
```

1.3 Red Hat 8

1.3.1 設定 Oracle Audit

(1) 切換 oracle 帳號

```
# su - oracle
```

(2) 登入 Oracle 資料庫

```
$ sqlplus / as sysdba
```

(3) 顯示審計參數

```
SQL> show parameter audit
```

(4) 顯示資料庫審計

```
SQL> show parameter audit_trail
```

(5) 顯示審計等級

```
SQL> show parameter audit_syslog_level
```

(6) 顯示 sysdba 特權用戶審計

```
SQL> show parameter audit_sys_operations
```

(7) 修改審計記錄到作業系統

```
SQL> alter system set audit_trail='OS' scope=spfile;
```

(8) 啟用 sysdba 特權用戶審計

```
SQL> alter system set audit_sys_operations=true scope=spfile;
```

(9) 修改審計紀錄 facility: local0 info 訊息

```
SQL> alter system set audit_syslog_level=local0.info' scope=spfile;
```

(10) 停止 Oracle 資料庫服務

```
SQL> shutdown immediate
```

(11) 啟動 Oracle 資料庫服務

```
SQL> startup
```

(12) 顯示審計參數

```
SQL> show parameter audit
```

(13) 離開 Oracle 資料庫

```
SQL> exit
```

1.3.2 設定 Rsyslog

(1) 編輯 Rsyslog 設定檔

```
# vi /etc/rsyslog.conf
```

(2) 將 Oracle log 傳送到 N-Reporter

```
# Send Oracle log to N-Reporter
local0.*                                @192.168.3.88
```

紅色文字部位請輸入 N-Reporter 系統 IP address

(3) 重啟 Rsyslog 服務和確認 Rsyslog 服務情形

```
# systemctl restart rsyslog && systemctl status rsyslog
```

2 Oracle Linux

2.1 Oracle Linux 6

2.1.1 設定 Oracle Audit

(1) 切換 oracle 帳號

```
# su - oracle
```

(2) 登入 Oracle 資料庫

```
$ sqlplus / as sysdba
```

(3) 顯示審計參數

```
SQL> show parameter audit
```

(4) 顯示資料庫審計

```
SQL> show parameter audit_trail
```

(5) 顯示審計等級

```
SQL> show parameter audit_syslog_level
```

(6) 顯示 sysdba 特權用戶審計

```
SQL> show parameter audit_sys_operations
```

(7) 修改審計記錄到作業系統

```
SQL> alter system set audit_trail='OS' scope=spfile;
```

(8) 啟用 sysdba 特權用戶審計

```
SQL> alter system set audit_sys_operations=true scope=spfile;
```

(9) 修改審計紀錄 facility: local0 info 訊息

```
SQL> alter system set audit_syslog_level=local0.info' scope=spfile;
```

(10) 停止 Oracle 資料庫服務

```
SQL> shutdown immediate
```

(11) 啟動 Oracle 資料庫服務

```
SQL> startup
```

(12) 顯示審計參數

```
SQL> show parameter audit
```

(13) 離開 Oracle 資料庫

```
SQL> exit
```

2.1.2 設定 Rsyslog

(1) 編輯 Rsyslog 設定檔

```
# vi /etc/rsyslog.conf
```

(2) 將 Oracle log 傳送到 N-Reporter

```
# Send Oracle log to N-Reporter
local0.*                                @192.168.3.88
```

紅色文字部位請輸入 N-Reporter 系統 IP address

(3) 重啟 Rsyslog 服務和確認 Rsyslog 服務情形

```
# service rsyslog restart && service rsyslog status
```

2.2 Oracle Linux 7

2.2.1 設定 Oracle Audit

(1) 切換 oracle 帳號

```
# su - oracle
```

(2) 登入 Oracle 資料庫

```
$ sqlplus / as sysdba
```

```
[oracle@oracle ~]$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Fri Jun 11 17:25:41 2021
Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle.  All rights reserved.


Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.3.0.0.0

SQL>
```

(3) 顯示審計參數

```
SQL> show parameter audit
```

```
SQL> show parameter audit

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_file_dest                      string      /opt/oracle/admin/ORCLCDB/adum
                                                 p
audit_sys_operations                 boolean     TRUE
audit_syslog_level                   string
audit_trail                          string      DB
unified_audit_common_systemlog       string
unified_audit_sga_queue_size         integer     1048576
unified_audit_systemlog              string
SQL>
```

(4) 顯示資料庫審計

```
SQL> show parameter audit_trail
```

```
SQL> show parameter audit_trail

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_trail                          string      DB
SQL>
```

(5) 修改審計記錄到作業系統

```
SQL> alter system set audit_trail='OS' scope=spfile;
```

```
SQL> alter system set audit_trail='OS' scope=spfile;

System altered.

SQL>
```

(6) 顯示審計等級

```
SQL> show parameter audit_syslog_level
```

```
SQL> show parameter audit_syslog_level

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_syslog_level                   string
SQL>
```

(7) 修改審計紀錄 **facility: local0 info** 訊息

```
SQL> alter system set audit_syslog_level=local0.info' scope=spfile;
```

```
SQL> alter system set audit_syslog_level='local0.info' scope=spfile;

System altered.

SQL>
```

(8) 顯示 **sysdba** 特權用戶審計

```
SQL> show parameter audit_sys_operations
```

```
SQL> show parameter audit_sys_operations

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_sys_operations                 boolean     TRUE
SQL>
```

(9) 啟用 **sysdba** 特權用戶審計

```
SQL> alter system set audit_sys_operations=true scope=spfile;
```

```
SQL> alter system set audit_sys_operations=true scope=spfile;

System altered.

SQL>
```

(10)　停止 Oracle 資料庫服務

```
SQL> shutdown immediate
```

```
SQL> shutdown immediate
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL>
```

(11)　啟動 Oracle 資料庫服務

```
SQL> startup
```

```
SQL> startup
ORACLE instance started.

Total System Global Area 2.0200E+10 bytes
Fixed Size                  9145232 bytes
Variable Size            2483027968 bytes
Database Buffers         1.7650E+10 bytes
Redo Buffers               57962496 bytes
Database mounted.
Database opened.
SQL>
```

(12)　顯示審計參數

```
SQL> show parameter audit
```

```
SQL> show parameter audit

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_file_dest                      string      /opt/oracle/admin/ORCLCDB/adum
                                                 p
audit_sys_operations                 boolean     TRUE
audit_syslog_level                   string      LOCAL0.INFO
audit_trail                          string      OS
unified_audit_common_systemlog       string
unified_audit_sga_queue_size         integer     1048576
unified_audit_systemlog              string
SQL>
```

(13)　離開 Oracle 資料庫

```
SQL> exit
```

```
SQL> exit
Disconnected from Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.3.0.0.0
[oracle@oracle ~]$
```

2.2.2 設定 Rsyslog

(1) 編輯 Rsyslog 設定檔

```
# vi /etc/rsyslog.conf
```

(2) 將 Oracle log 傳送到 N-Reporter

```
# Send Oracle log to N-Reporter
local0.*                                @192.168.3.88
```

紅色文字部位請輸入 N-Reporter 系統 IP address

(3) 重啟 Rsyslog 服務和確認 Rsyslog 服務情形

```
# systemctl restart rsyslog && systemctl status rsyslog
```

2.3 Oracle Linux 8

2.3.1 設定 Oracle Audit

(1) 切換 oracle 帳號

```
# su - oracle
```

(2) 登入 Oracle 資料庫

```
$ sqlplus / as sysdba
```

(3) 顯示審計參數

```
SQL> show parameter audit
```

(4) 顯示資料庫審計

```
SQL> show parameter audit_trail
```

(5) 顯示審計等級

```
SQL> show parameter audit_syslog_level
```

(6) 顯示 sysdba 特權用戶審計

```
SQL> show parameter audit_sys_operations
```

(7) 修改審計記錄到作業系統

```
SQL> alter system set audit_trail='OS' scope=spfile;
```

(8) 啟用 sysdba 特權用戶審計

```
SQL> alter system set audit_sys_operations=true scope=spfile;
```

(9) 修改審計紀錄 facility: local0 info 訊息

```
SQL> alter system set audit_syslog_level=local0.info' scope=spfile;
```

(10) 停止 Oracle 資料庫服務

```
SQL> shutdown immediate
```

(11) 啟動 Oracle 資料庫服務

```
SQL> startup
```

(12) 顯示審計參數

```
SQL> show parameter audit
```

(13) 離開 Oracle 資料庫

```
SQL> exit
```

2.3.2 設定 Rsyslog

(1) 編輯 Rsyslog 設定檔

```
# vi /etc/rsyslog.conf
```

(2) 將 Oracle log 傳送到 N-Reporter

```
# Send Oracle log to N-Reporter
local0.*                                @192.168.3.88
```

紅色文字部位請輸入 N-Reporter 系統 IP address

(3) 重啟 Rsyslog 服務和確認 Rsyslog 服務情形

```
# systemctl restart rsyslog && systemctl status rsyslog
```

3 SUSE Linux

3.1 設定 Oracle Audit

(1) 切換 oracle 帳號

```
# su - oracle
```

(2) 登入 Oracle 資料庫

```
$ sqlplus / as sysdba
```

(3) 顯示審計參數

```
SQL> show parameter audit
```

(4) 顯示資料庫審計

```
SQL> show parameter audit_trail
```

(5) 顯示審計等級

```
SQL> show parameter audit_syslog_level
```

(6) 顯示 sysdba 特權用戶審計

```
SQL> show parameter audit_sys_operations
```

(7) 修改審計記錄到作業系統

```
SQL> alter system set audit_trail='OS' scope=spfile;
```

(8) 啟用 sysdba 特權用戶審計

```
SQL> alter system set audit_sys_operations=true scope=spfile;
```

(9) 修改審計紀錄 facility: local0 info 訊息

```
SQL> alter system set audit_syslog_level=local0.info' scope=spfile;
```

(10) 停止 Oracle 資料庫服務

```
SQL> shutdown immediate
```

(11) 啟動 Oracle 資料庫服務

```
SQL> startup
```

(12) 顯示審計參數

```
SQL> show parameter audit
```

(13) 離開 Oracle 資料庫

```
SQL> exit
```

3.2 設定 Rsyslog

(1) 編輯 Rsyslog 設定檔

```
# vi /etc/rsyslog.conf
```

(2) 將 Oracle log 傳送到 N-Reporter

```
# Send Oracle log to N-Reporter
local0.*                                @ 192.168.3.88
```

紅色文字部位請輸入 N-Reporter 系統 IP address

(3) 重啟 Rsyslog 服務和確認 Rsyslog 服務情形

```
# systemctl restart rsyslog && systemctl status rsyslog
```

4 AIX

4.1 設定 Oracle Audit

(1) 切換 oracle 帳號

```
# su - oracle
```

(2) 登入 Oracle 資料庫

```
$ sqlplus / as sysdba
```

(3) 顯示審計參數

```
SQL> show parameter audit;
```

(4) 顯示資料庫審計

```
SQL> show parameter audit_trail;
```

(5) 顯示審計等級

```
SQL> show parameter audit_syslog_level;
```

(6) 顯示 sysdba 特權用戶審計

```
SQL> show parameter audit_sys_operations;
```

(7) 修改審計記錄到作業系統

```
SQL> alter system set audit_trail='OS' scope=spfile;
```

(8) 啟用 sysdba 特權用戶審計

```
SQL> alter system set audit_sys_operations=true scope=spfile;
```

(9) 修改審計紀錄 facility: local0 info 訊息

```
SQL> alter system set audit_syslog_level=local0.info' scope=spfile;
```

(10) 停止 Oracle 資料庫服務

```
SQL> shutdown immediate;
```

(11) 啟動 Oracle 資料庫服務

```
SQL> startup;
```

(12) 顯示審計參數

```
SQL> show parameter audit;
```

(13) 離開 Oracle 資料庫

```
SQL> exit;
```

4.2 設定 Syslogd

(1) 編輯 syslog 設定檔

```
# vi /etc/rsyslog.conf
```

(2) 將 Oracle log 傳送到 N-Reporter

```
# Send Oracle log to N-Reporter
local0.*                                @ 192.168.3.88
```

紅色文字部位請輸入 N-Reporter 系統 IP address

(3) 停止 syslogd 服務和啟動 syslogd 服務

```
# stopsrc -s syslogd && startsrc -s syslogd
```

(4) 確認 syslogd 服務情形

```
# ps -ef | grep syslogd
```

5 Windows

5.1 NXLog

5.1.1 NXLog 安裝

(1) 下載 NXLog CE(Community Edition

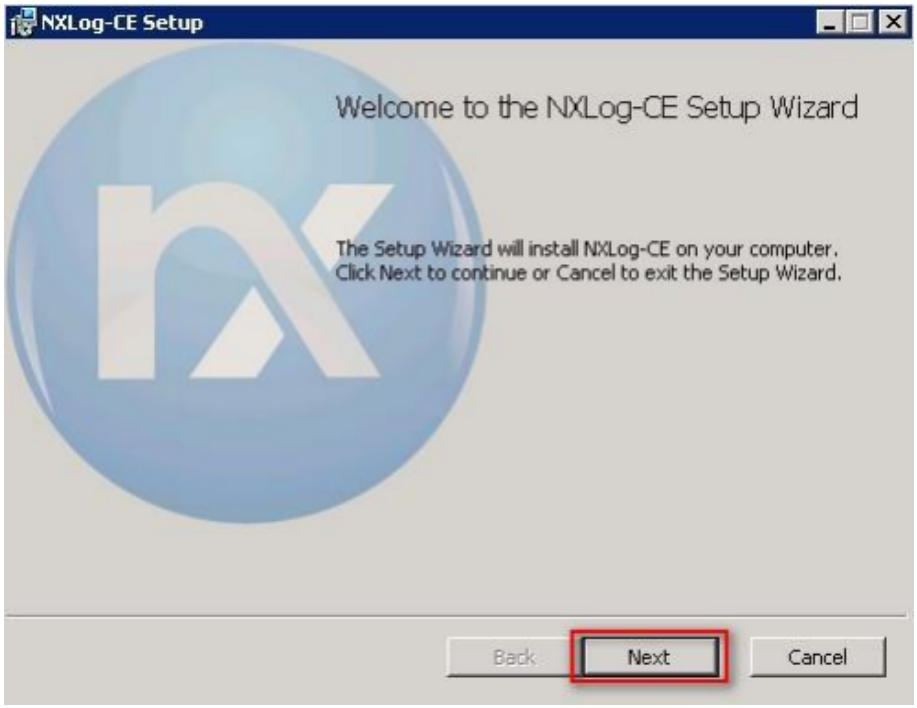
前往網址 https://nxlog.co/products/nxlog-community-edition/download

下載網址最新版 nxlog-ce-x.x.xxxx.msi，範例: nxlog-ce-3.0.2272.msi

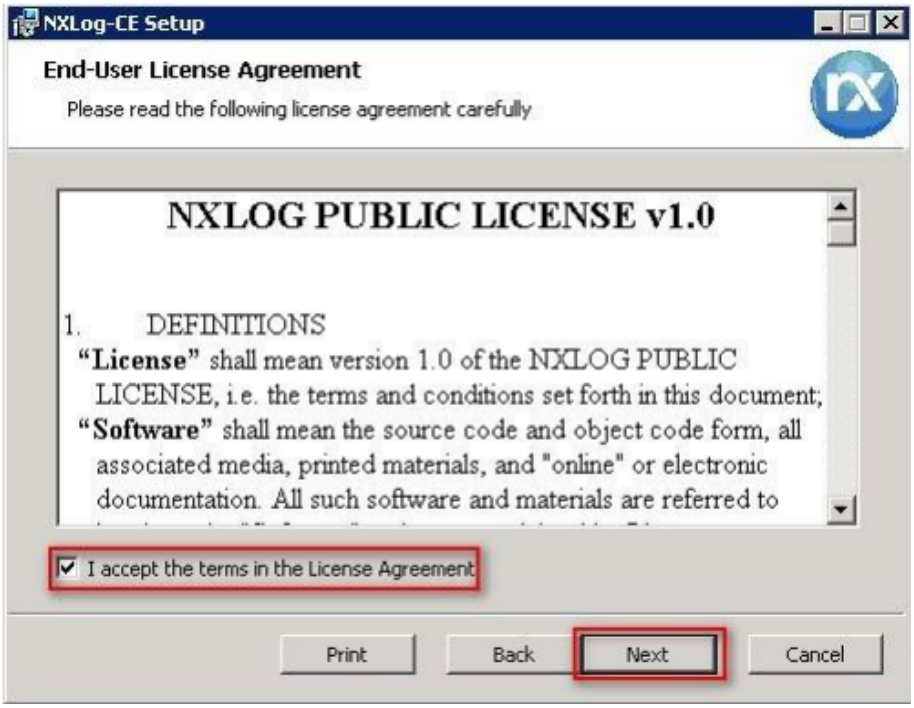
註：若需要下載 NXLog 32bit 版本，請與我們連繫。

(2) 安裝 NXLog

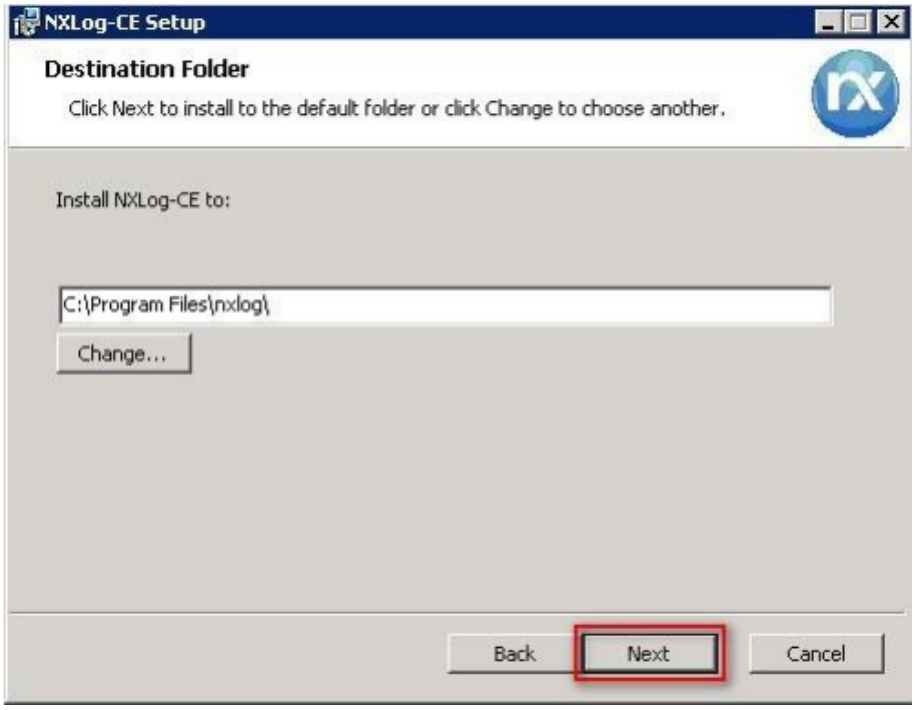
點擊 [nxlog-ce-3.2.2329.msi] -> 按 [Next].



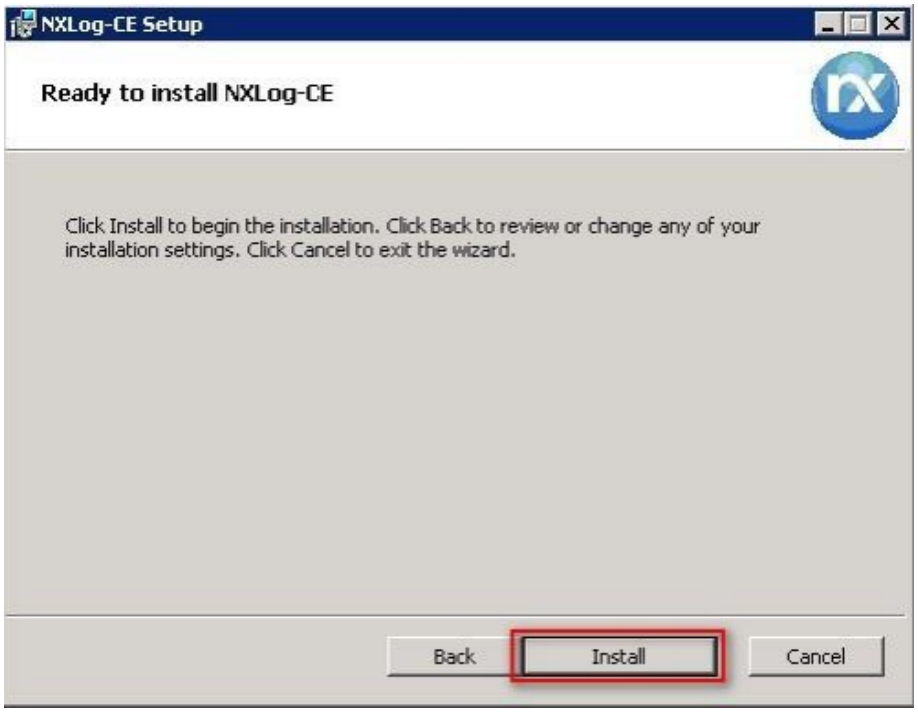
-> 勾選 [I accept the terms in the License Agreement], 按 [Next] .



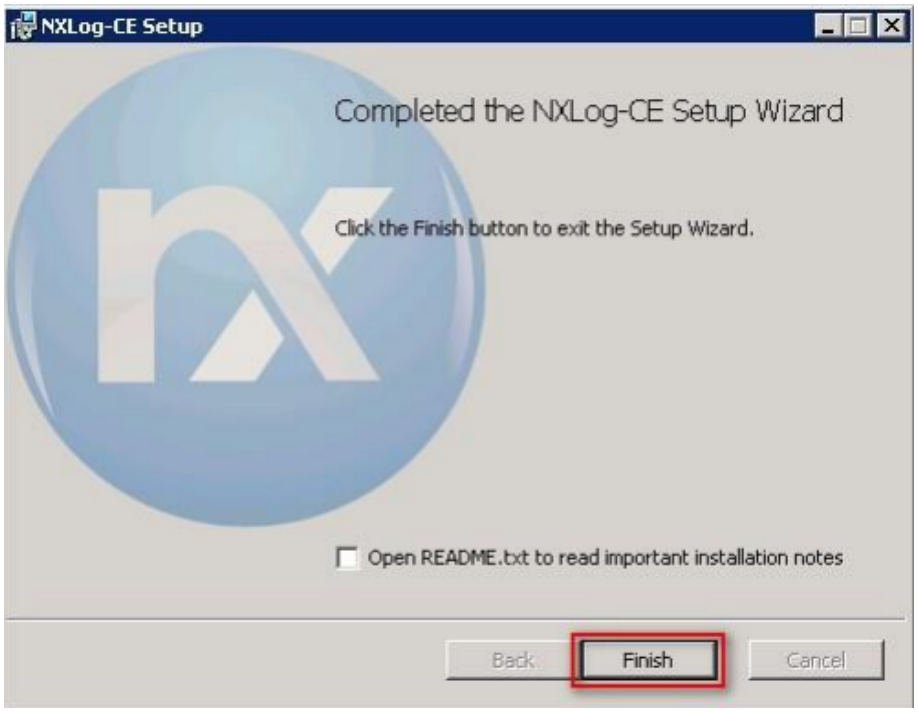
-> 按 [Next]. (預設安裝路徑為 C:\Program Files\nxlog\)



-> 按 [Install].



-> 按 [Finish].



5.1.2 NXLog 設定檔下載

(1) 開啟 [Windows PowerShell]

(2) 下載 nxlog_Oracle.conf 並覆蓋 NXLog 設定檔。

```
PS C:\>  Invoke-WebRequest -Uri`http://www.npartnertech.com/download/tech/nxlog_Oracle.conf'
-OutFile 'C:\Program Files\nxlog\conf\nxlog.conf'
```

本文件範例是 64 位元作業系統，若作業系統是 32 位元，紅色文字部位請改以下設定 'C:\Program Files (x86)\nxlog\conf\nxlog.conf'

5.1.3 NXLog 設定檔

```
## Please set the ROOT to the folder your nxlog was installed into, otherwise it will not start.
define NCloud  192.168.3.88
define ROOT  C:\Program Files\nxlog

Moduledir %ROOT%\modules
CacheDir %ROOT%\data
Pidfile %ROOT%\data\nxlog.pid
SpoolDir %ROOT%\data
LogFile %ROOT%\data\nxlog.log

## Load the modules needed by the outputs
<Extension syslog>
    Module    xm_syslog
</Extension>

## For Oracle event log file use the following:
<Input in_eventlog>
    Module    im_msvistalog
    ReadFromLast    TRUE
    SavePos    TRUE
    Query    <QueryList>\
               <Query Id="0">\
                   <Select Path="Application">*[System[(Provider[@Name='Oracle.orcl'])]]</Select>\
               </Query>\
             </QueryList>
</Input>

<Output out_eventlog>
    Module    om_udp
    Host    %NCloud%
    Port    514
    Exec $Message=string($SourceName)+":"+string($EventID)+":"+$Message;
    Exec if ($EventType == 'ERROR' or $EventType == 'AUDIT_FAILURE'){$SyslogSeverityValue=3;}\
              else if($EventType=='WARNING') {$SyslogSeverityValue=4;}\
              else if($EventType=='INFO' or $EventType=='AUDIT_SUCCESS') {$SyslogSeverityValue=5;}\
    Exec    to_syslog_bsd();
</Output>

<Route eventlog>
    Path    in_eventlog => out_eventlog
</Route>
```

藍色文字部位請輸入 N-Reporter 系統 IP address

```
define NCloud  192.168.3.88
```

本文件範例環境為 64bit 作業系統，若作業系統環境為 32bit 請改為以下設定

```
define ROOT  C:\Program Files (x86)\nxlog
```

藍色文字部分請輸入 Oracle 執行個體名稱

```
@Name='Oracle.orcl'
```

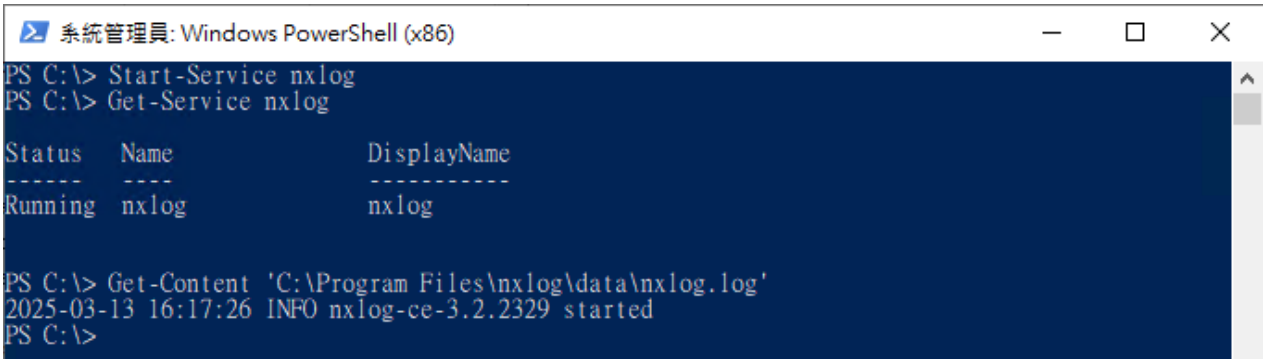
修改設定檔內容後需” 另存新檔” 覆蓋原本檔案，1. 存檔類型請選擇” 所有檔案 (*.*)”，2. 編碼請選擇”UTF-8” 以免編碼錯誤造成服務無法正常開啟。

5.1.4 NXLog 啟動服務

(1) 開啟 [Windows PowerShell]

(2) 重新啟動 NXLog 服務，檢查 NXLog 服務和確認 NXLog 沒有錯誤訊息

```
PS C:\> Start-Service nxlog
PS C:\> Get-Service nxlog
PS C:\> Get-Content 'C:\Program Files\nxlog\data\nxlog.log'
```



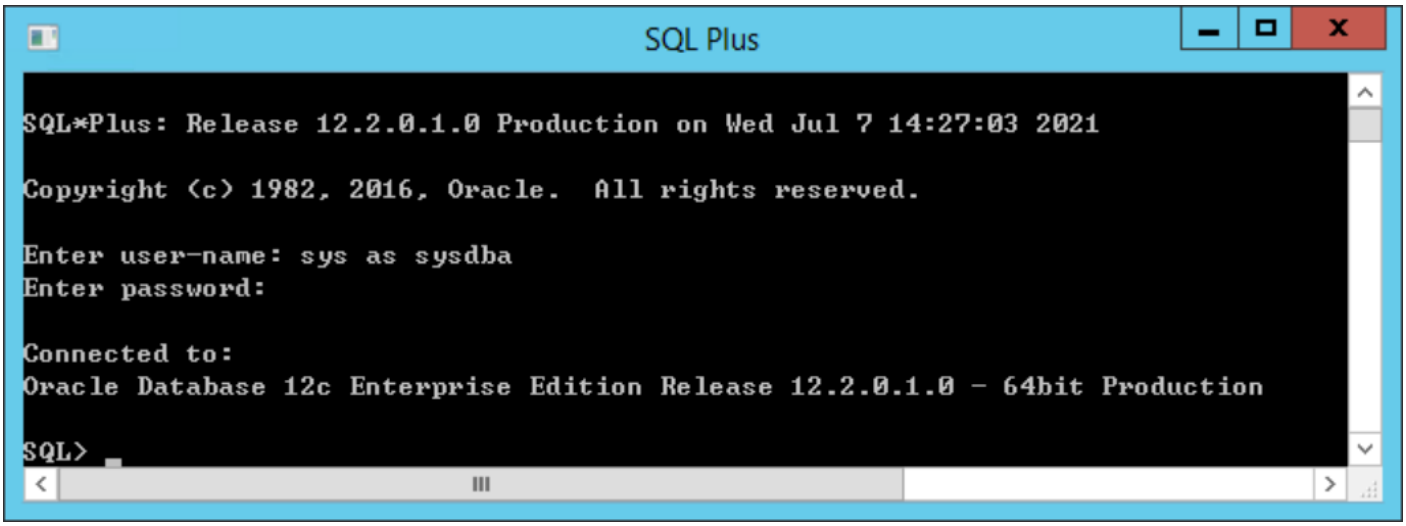
本文件範例是 NXLog 64bit 版本，若是 NXLog 32bit 版本，紅色文字部位請改以下設定 `'C:\Program Files (x86)\nxlog\conf\nxlog.conf'`

5.2 Oracle Database

5.2.1 Oracle 12c Audit 設定

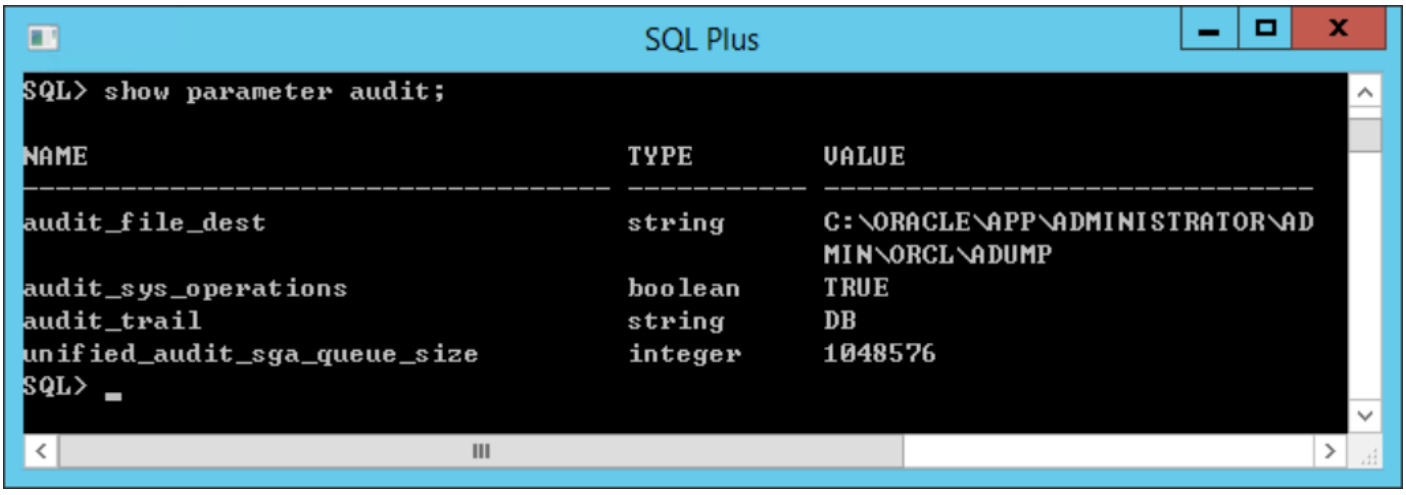
(1) 開啟 [SQL Plus]

(2) 輸入 `user-name:` 和 `password:`



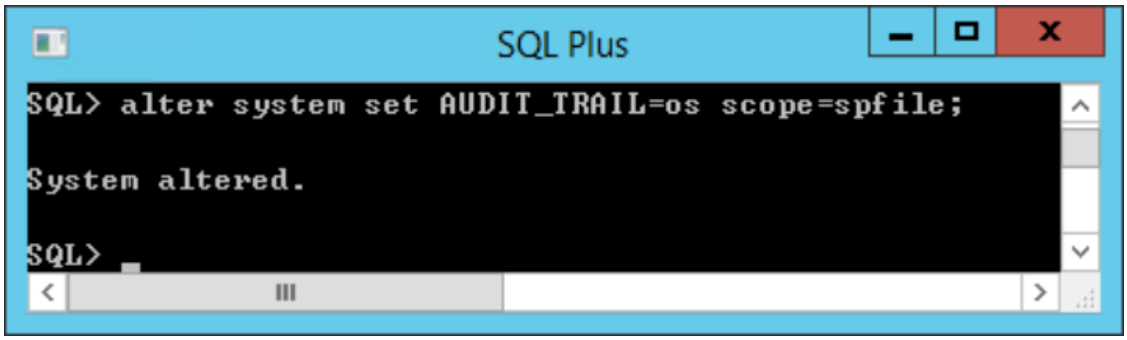
(3) 顯示審計參數

```
SQL> show parameter audit;
```



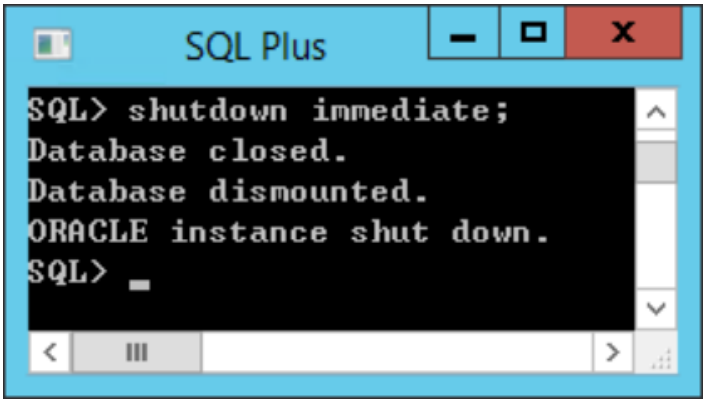
(4)　修改審計紀錄到作業系統

```
SQL>  alter system set AUDIT_TRAIL=os scope=spfile;
```



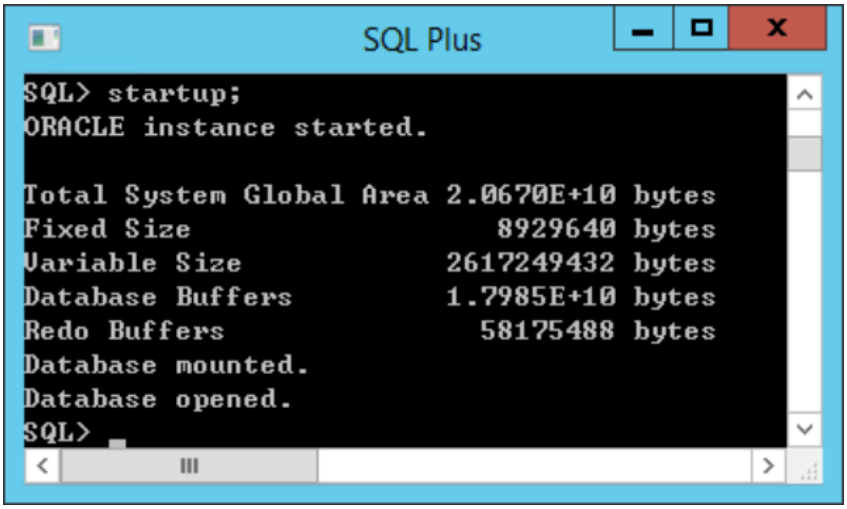
(5)　停止 Oracle 資料庫服務

```
SQL>  shutdown immediate;
```



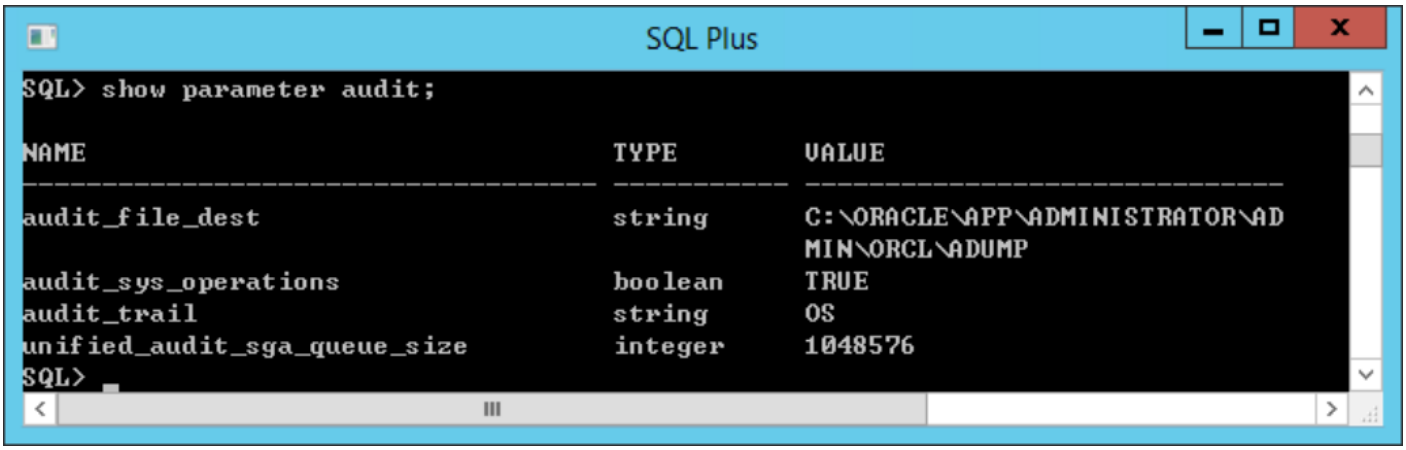
(6)　啟動 Oracle 資料庫服務

```
SQL>  startup;
```



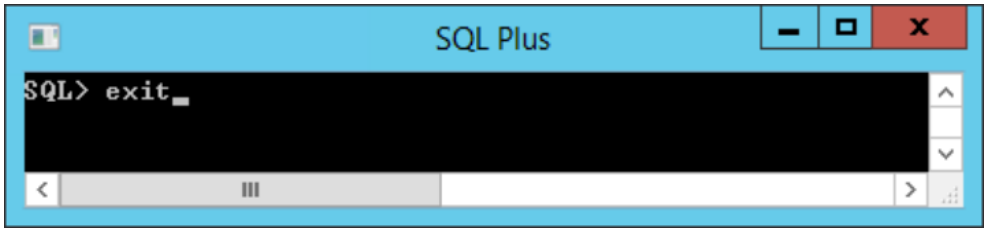
(7) 顯示審計參數

```
SQL>  show parameter audit;
```



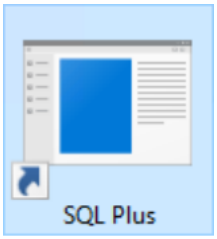
(8) 離開 [SQL Plus]

```
SQL>  exit;
```

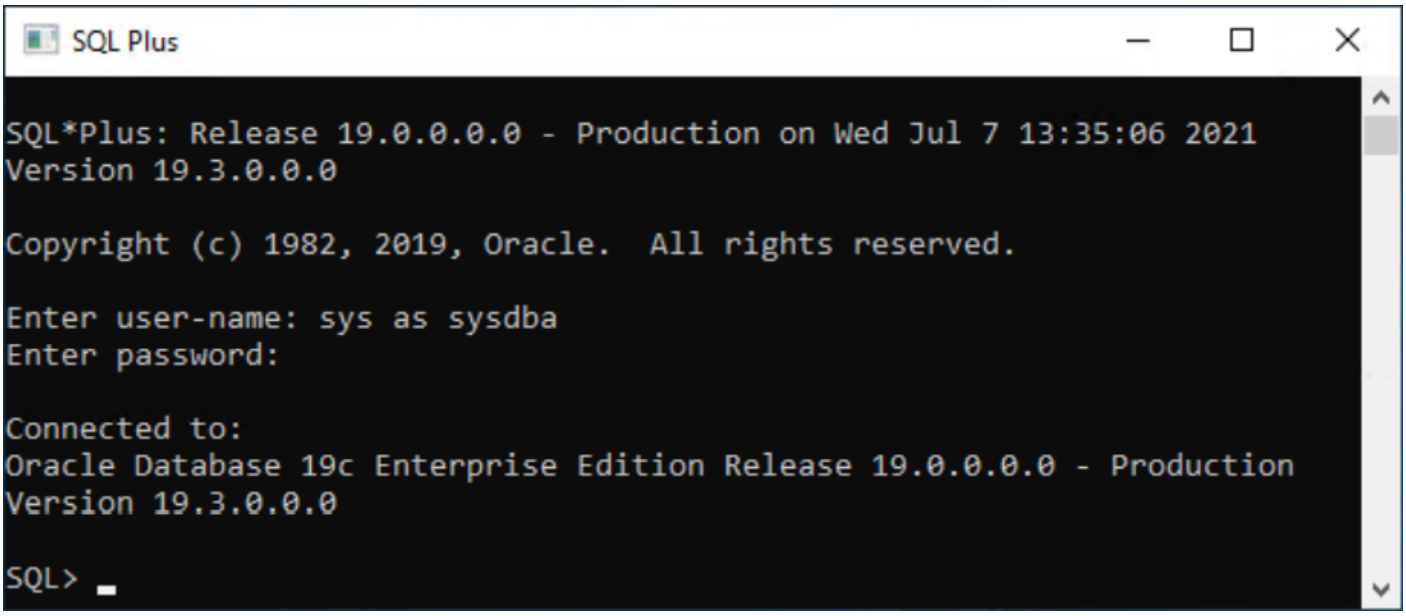


5.2.2 Oracle 19c Audit 設定

(1) 開啟 [SQL Plus]

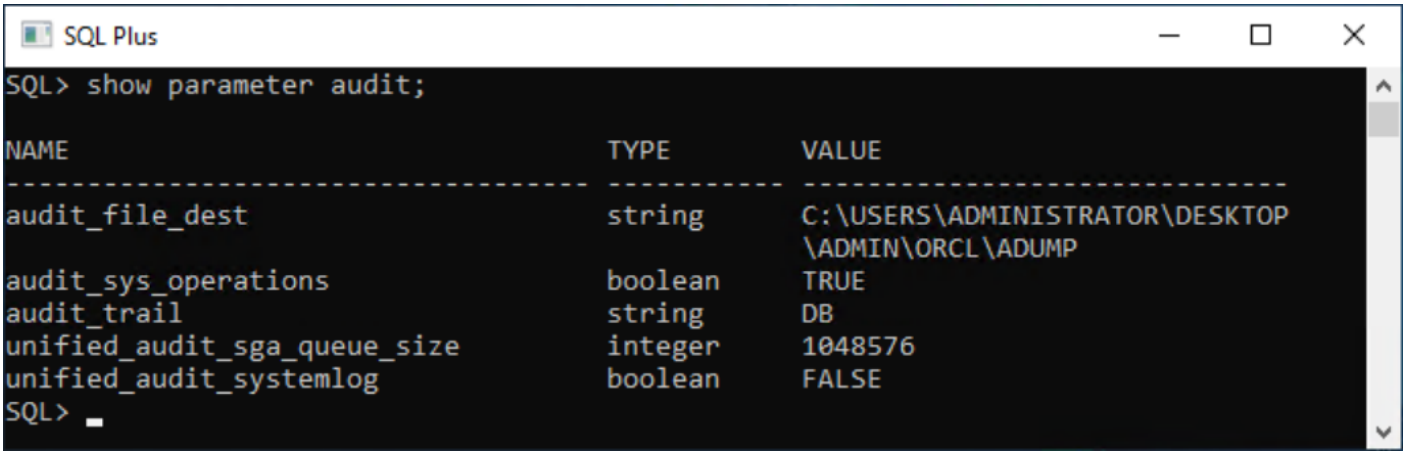


(2) 輸入 `user-name:` 和 `password:`



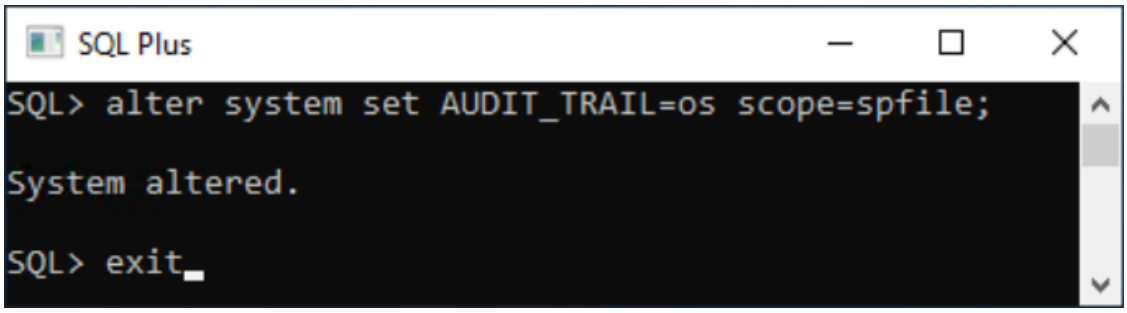
(3) 顯示審計參數

```
SQL> show parameter audit;
```



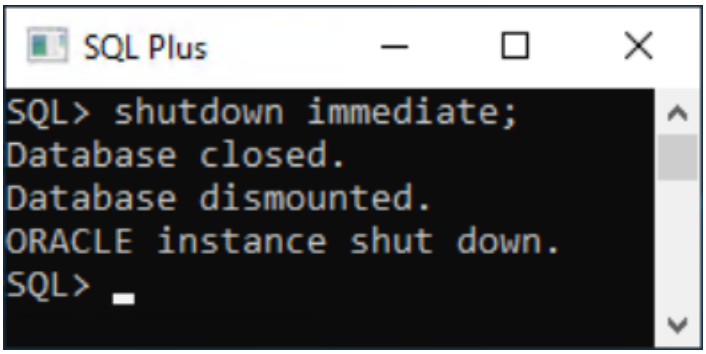
(4)　修改審計紀錄到作業系統

```
SQL>  alter system set AUDIT_TRAIL=os scope=spfile;
```



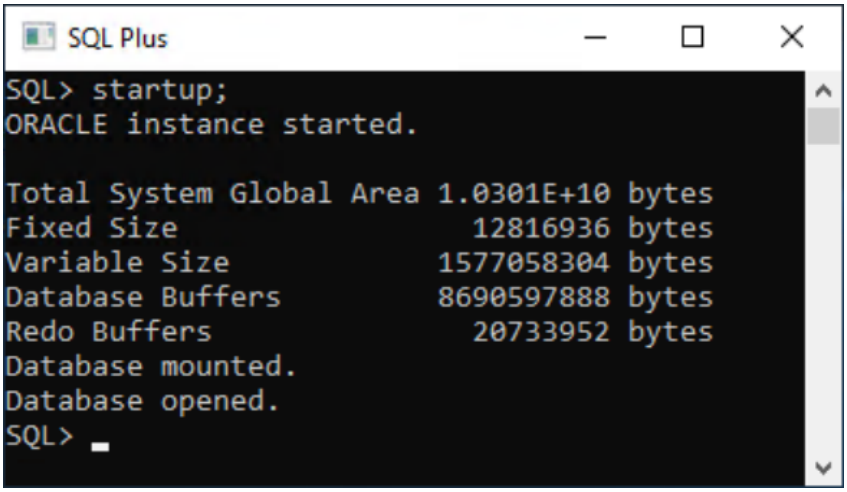
(5)　停止 Oracle 資料庫服務

```
SQL>  shutdown immediate;
```



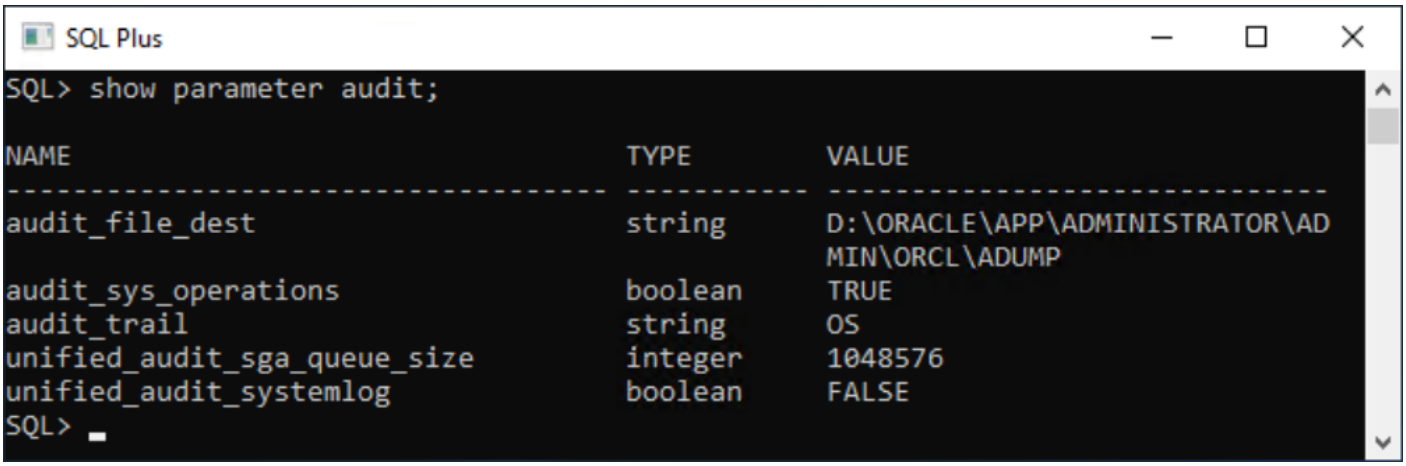
(6)　啟動 Oracle 資料庫服務

```
SQL>  startup;
```



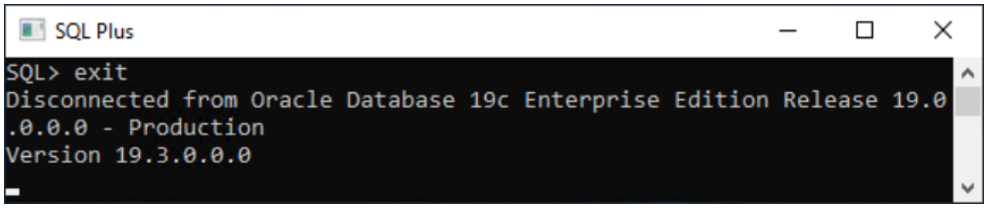
(7) 顯示審計參數

```
SQL>  show parameter audit;
```



(8) 離開 [SQL Plus]

```
SQL>  exit;
```



6 Oracle RAC

作業系統以 Oracle Linux 為範例。

6.1 Node 1

6.1.1 設定 Oracle Audit

(1) 切換 oracle 帳號

```
# su - oracle
```

(2) 登入 Oracle 資料庫

```
$ sqlplus / as sysdba
```

```
[oracle@oracle-rac1 ~]$ sqlplus / as sysdba

SQL*Plus: Release 12.2.0.1.0 Production on Wed Jul 7 10:43:39 2021

Copyright (c) 1982, 2016, Oracle.  All rights reserved.


Connected to:
Oracle Database 12c Enterprise Edition Release 12.2.0.1.0 - 64bit Production

SQL>
```

(3) 查看當前資料庫的執行個體名稱

```
SQL>  SELECT inst_name FROM v$active_instances;
```

```
SQL> SELECT inst_name FROM v$active_instances;

INST_NAME
--------------------------------------------------------------------------------
oracle-rac1.localdomain:cdbrac1
oracle-rac2.localdomain:cdbrac2

SQL>
```

(4) 查看 Oracle SID

```
SQL>  select instance_name from V$instance;
```

```
SQL> select instance_name from V$instance;

INSTANCE_NAME
----------------
cdbrac1

SQL>
```

(5) 查看 Oracle spfile

```
SQL>  show parameter spfile;
```

```
SQL> show parameter spfile;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
spfile                               string      +DATA/CDBRAC/PARAMETERFILE/spf
                                                 ile.309.1077273243
SQL>
```

(6) 顯示審計參數

```
SQL>  show parameter audit;
```

```
SQL> show parameter audit;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_file_dest                      string      /u01/app/oracle/admin/cdbrac/a
                                                 dump
audit_sys_operations                 boolean     TRUE
audit_syslog_level                   string
audit_trail                          string      DB
unified_audit_sga_queue_size         integer     1048576
SQL>
```

(7)　顯示資料庫審計

```
SQL>   show parameter audit_trail;
```

```
SQL> show parameter audit_trail;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_trail                          string      DB
SQL>
```

(8)　修改審計記錄到作業系統

```
SQL>   alter system set audit_trail='OS' scope=spfile;
```

```
SQL> alter system set audit_trail='OS' scope=spfile;

System altered.

SQL>
```

(9)　顯示審計等級

```
SQL>   show parameter audit_syslog_level;
```

```
SQL> show parameter audit_syslog_level;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_syslog_level                   string
SQL>
```

(10)　修改審計記錄 facility: local0 info 訊息

```
SQL>   alter system set audit_syslog_level='local0.info' scope=spfile;
```

```
SQL> alter system set audit_syslog_level='local0.info' scope=spfile;

System altered.

SQL>
```

(11)　顯示 sysdba 特權用戶審計

```
SQL>   show parameter audit_sys_operations;
```

```
SQL> show parameter audit_sys_operations;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_sys_operations                 boolean     TRUE
SQL>
```

(12)　啟用 sysdba 特權用戶審計

```
SQL>   alter system set audit_syslog_operations=true scope=spfile;
```

```
SQL> alter system set audit_sys_operations=true scope=spfile;

System altered.

SQL>
```

(13)　停止 Oracle 資料庫服務

```
SQL>   shutdown immediate;
```

```
SQL> shutdown immediate;
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL>
```

(14)　啟動 Oracle 資料庫服務

```
SQL>   startup;
```

```
SQL> startup;
ORACLE instance started.

Total System Global Area 3707764736 bytes
Fixed Size                  8799320 bytes
Variable Size             905972648 bytes
Database Buffers         2785017856 bytes
Redo Buffers                7974912 bytes
Database mounted.
Database opened.
SQL>
```

(15) 顯示審計參數

```
SQL>   show parameter audit;
```

```
SQL> show parameter audit;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_file_dest                      string      /u01/app/oracle/admin/cdbrac/a
                                                 dump
audit_sys_operations                 boolean     TRUE
audit_syslog_level                   string      LOCAL0.INFO
audit_trail                          string      OS
unified_audit_sga_queue_size         integer     1048576
SQL>
```

(16) 離開 Oracle 資料庫

```
SQL>   exit;
```

```
SQL> exit;
Disconnected from Oracle Database 12c Enterprise Edition Release 12.2.0.1.0 - 64bit Production
[oracle@oracle-rac1 ~]$
```

6.1.2 設定 Rsyslog

(1) 編輯 Rsyslog 設定檔

```
# vi /etc/rsyslog.conf
```

(2) 將 Oracle log 傳送到 N-Reporter

```
# Send Oracle log to N-Reporter
local0.*                                @192.168.3.88
```

紅色文字部位請輸入 N-Reporter 系統 IP address

(3) 重啟 Rsyslog 服務和確認 Rsyslog 服務情形

```
# systemctl restart rsyslog && systemctl status rsyslog
```

6.2 Node 2

6.2.1 設定 Oracle Audit

(1) 切換 oracle 帳號

```
# su - oracle
```

(2) 登入 Oracle 資料庫

```
$  sqlplus / as sysdba
```

```
[oracle@oracle-rac2 ~]$ sqlplus / as sysdba

SQL*Plus: Release 12.2.0.1.0 Production on Wed Jul 7 11:01:05 2021

Copyright (c) 1982, 2016, Oracle.  All rights reserved.


Connected to:
Oracle Database 12c Enterprise Edition Release 12.2.0.1.0 - 64bit Production

SQL>
```

(3) 查看當前資料庫的執行個體名稱

```
SQL>  SELECT inst_name FROM v$active_instances;
```

```
SQL> SELECT inst_name FROM v$active_instances;

INST_NAME
------------------------------------------------------------------------------
oracle-rac1.localdomain:cdbrac1
oracle-rac2.localdomain:cdbrac2

SQL>
```

(4) 查看 Oracle SID

```
SQL>  select instance_name from V$instance;
```

```
SQL> select instance_name from V$instance;

INSTANCE_NAME
----------------
cdbrac2

SQL>
```

(5) 查看 Oracle spfile

```
SQL>  show parameter spfile;
```

```
SQL> show parameter spfile;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
spfile                               string      +DATA/CDBRAC/PARAMETERFILE/spf
                                                 ile.309.1077273243

SQL>
```

(6) 顯示審計參數

```
SQL>  show parameter audit;
```

```
SQL> show parameter audit;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_file_dest                      string      /u01/app/oracle/admin/cdbrac/a
                                                 dump
audit_sys_operations                 boolean     TRUE
audit_syslog_level                   string
audit_trail                          string      DB
unified_audit_sga_queue_size         integer     1048576
SQL>
```

(7) 顯示資料庫審計

```
SQL>  show parameter audit_trail;
```

```
SQL> show parameter audit_trail;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_trail                          string      DB
SQL>
```

(8) 修改審計記錄到作業系統

```
SQL>  alter system set audit_trail='OS' scope=spfile;
```

```
SQL> alter system set audit_trail='OS' scope=spfile;

System altered.

SQL>
```

(9)　顯示審計等級

```
SQL>   show parameter audit_syslog_level;
```

```
SQL> show parameter audit_syslog_level;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_syslog_level                   string
SQL>
```

(10)　修改審計記錄 facility: local0 info 訊息

```
SQL>   alter system set audit_syslog_level='local0.info' scope=spfile;
```

```
SQL> alter system set audit_syslog_level='local0.info' scope=spfile;

System altered.

SQL>
```

(11)　顯示 sysdba 特權用戶審計

```
SQL>   show parameter audit_sys_operations;
```

```
SQL> show parameter audit_sys_operations;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_sys_operations                 boolean     TRUE
SQL>
```

(12)　啟用 sysdba 特權用戶審計

```
SQL>   alter system set audit_sys_operations=true scope=spfile;
```

```
SQL> alter system set audit_sys_operations=true scope=spfile;

System altered.

SQL>
```

(13)　停止 Oracle 資料庫服務

```
SQL>   shutdown immediate;
```

```
SQL> shutdown immediate;
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL>
```

(14)　啟動 Oracle 資料庫服務

```
SQL>   startup;
```

```
SQL> startup;
ORACLE instance started.

Total System Global Area 3707764736 bytes
Fixed Size                  8799320 bytes
Variable Size             905972648 bytes
Database Buffers         2785017856 bytes
Redo Buffers                7974912 bytes
Database mounted.
Database opened.
SQL>
```

(15)　顯示審計參數

```
SQL>   show parameter audit;
```

```
SQL> show parameter audit;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
audit_file_dest                      string      /u01/app/oracle/admin/cdbrac/a
                                                 dump
audit_sys_operations                 boolean     TRUE
audit_syslog_level                   string      LOCAL0.INFO
audit_trail                          string      OS
unified_audit_sga_queue_size         integer     1048576
SQL>
```

(16)　離開 Oracle 資料庫

```
SQL>   exit;
```

```
SQL> exit;
Disconnected from Oracle Database 12c Enterprise Edition Release 12.2.0.1.0 - 64bit Production
[oracle@oracle-rac2 ~]$
```

6.2.2 設定 Rsyslog

(1) 編輯 Rsyslog 設定檔

```
# vi /etc/rsyslog.conf
```

(2) 將 Oracle log 傳送到 N-Reporter

```
# Send Oracle log to N-Reporter
local0.*                                @192.168.3.88
```

紅色文字部位請輸入 N-Reporter 系統 IP address

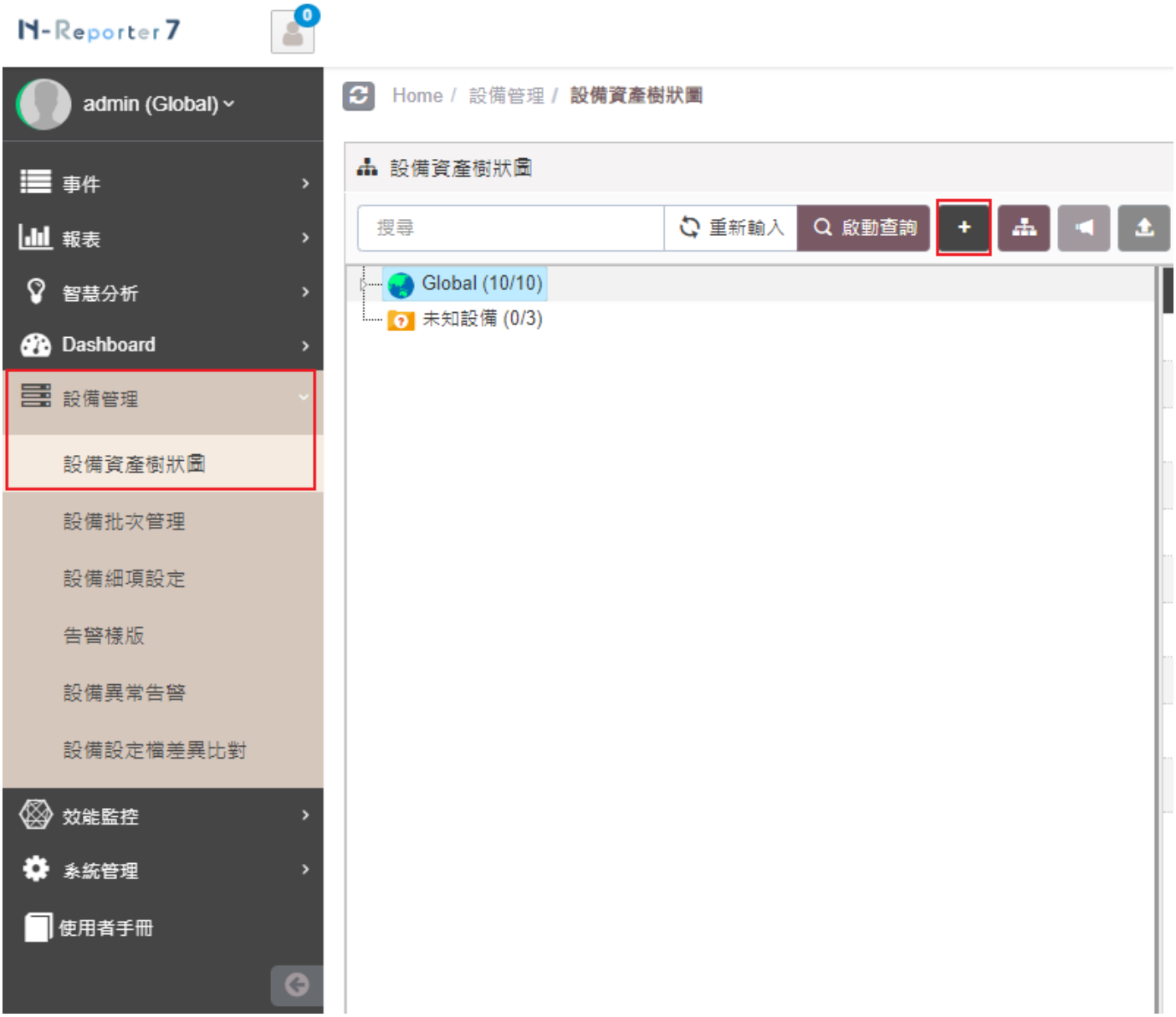
(3) 重啟 Rsyslog 服務和確認 Rsyslog 服務情形

```
# systemctl restart rsyslog && systemctl status rsyslog
```

7 N-Reporter

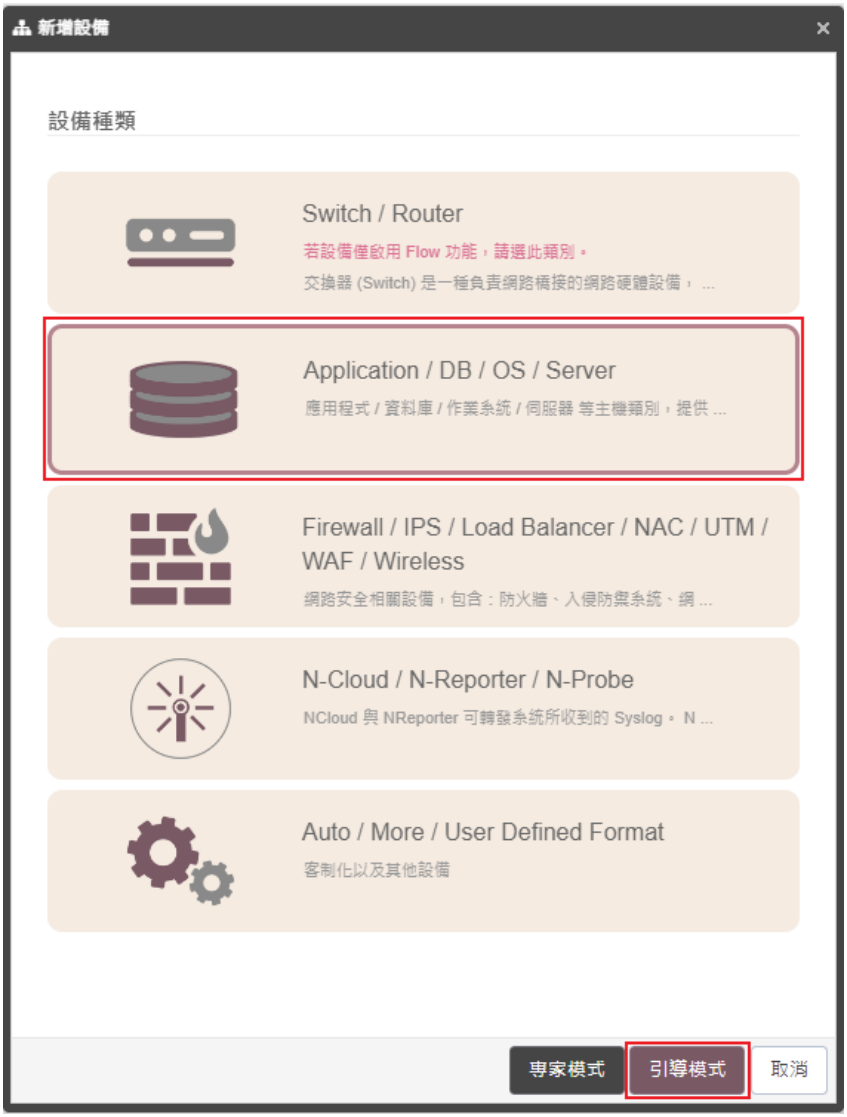
(1) 新增 Oracle Database 設備

[設備管理] -> [設備樹狀圖] -> 點選 [新增]



(2) 選擇設備種類

選擇 [Application/DB/OS/Server]-> 點選 [引導模式]



7.1 Linux/ AIX

(1) 設備基本設定

輸入設備名稱和IP->Syslog 資料格式選擇 [Oracle]-> 點選 [下一步]

(2) Syslog 相關設定

Facility 選擇 [(22) local use 6 (local6)]-> 點選 [下一步]

(若勾選 [Raw Data 保留]，則 [事件查詢] 顯示 Raw Data 資訊)

(3) 其他

設備 Icon 選擇 [Host]-> 接收狀態選擇 [啟用]-> 點選 [下一步]->[確認]

7.2 Windows

(1) 設備基本設定

輸入設備名稱和IP->Syslog 資料格式選擇 [Windows]-> 點選 [下一步]

(2) Syslog 相關設定

Facility 保持預設-> 點選 [下一步]

(若勾選 [Raw Data 保留]，則 [事件查詢] 顯示 Raw Data 資訊)

(3) 其他

設備 Icon 選擇 [Host]-> 接收狀態選擇 [啟用]-> 點選 [下一步]->[確認]

8 問題排除

(1) 查看 Oracle SID

```
SQL>  select instance_name from V$instance;
```

```
SQL> select instance_name from V$instance;

INSTANCE_NAME
----------------
ORCLCDB

SQL>
```

(2) 查看 Oracle DB 系統以 pfile 還是 spfile 啟動

```
SQL>  SELECT DECODE(value, NULL, 'PFILE', 'SPFILE') "Init File Type" FROM sys.v_$parameter
WHERE name ='spfile';
```

```
SQL> SELECT DECODE(value, NULL, 'PFILE', 'SPFILE') "Init File Type" FROM sys.v_$parameter WHERE name = 'spfile';

Init F
------
SPFILE

SQL>
```

(3) 查看 Oracle spfile

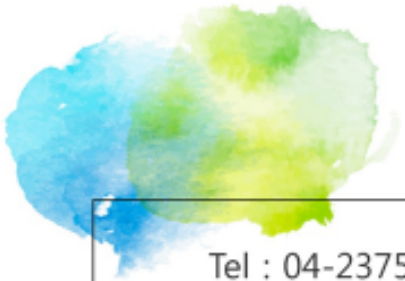
```
SQL>  show parameter spfile;
```

```
SQL> show parameter spfile;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
spfile                               string      /opt/oracle/product/19c/dbhome
                                                 _1/dbs/spfileORCLCDB.ora
SQL>
```

(4) 查看 Oracle pfile

```
SQL>  show parameter pfile;
```

```
SQL> show parameter pfile;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
spfile                               string      /opt/oracle/product/19c/dbhome
                                                 _1/dbs/spfileORCLCDB.ora
SQL>
```



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