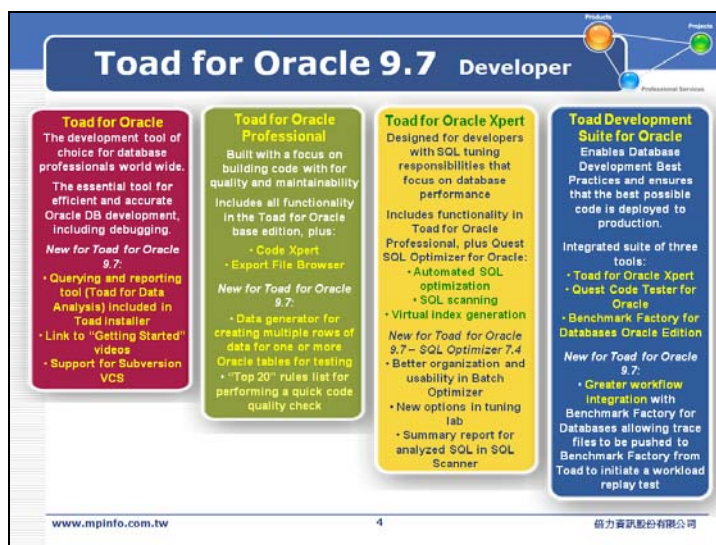


TOAD for Oracle For Oracle 資料庫健檢

TOAD for Oracle 的功能介紹又來了，這一次給各位讀者介紹 TOAD for Oracle 的一個資料庫管理強大功能 "Database Health Check"，有許多人可能感到很奇怪，TOAD for Oracle 不是拿來作開發程式的嗎？什麼時候有資料庫管理的功能了？這就要從 TOAD for Oracle 的總公司 QUEST 談起了。

QUEST 自從將 TOAD for Oracle 收編旗下，便不斷的擴展 TOAD for Oracle 的功能，使 TOAD for Oracle 不再是單一的開發應用程式的工具，而將 TOAD for Oracle 發展為資料管理與程式開發的全方位工具。TOAD for Oracle 又可分為程式開發應用，與資料庫管理應用兩大分類。

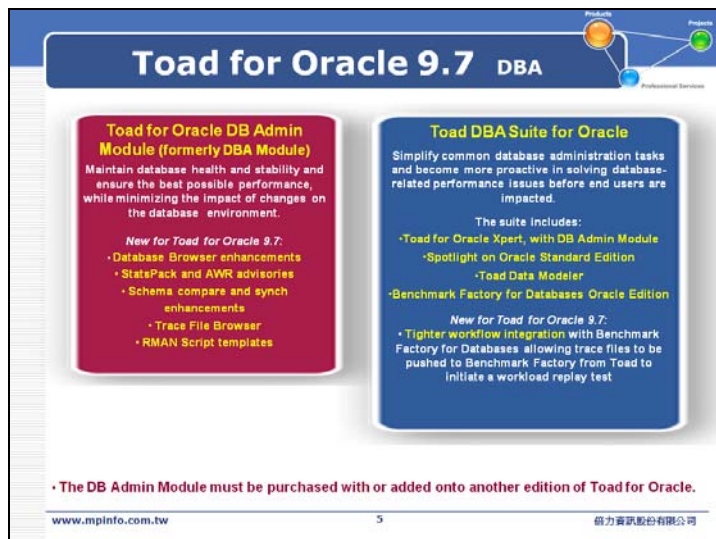


Toad for Oracle 9.7 Developer

- Toad for Oracle**
The development tool of choice for database professionals world wide.
The essential tool for efficient and accurate Oracle DB development, including debugging.
New for Toad for Oracle 9.7:
 - Querying and reporting tool (Toad for Data Analysis) included in Toad Installer
 - Link to "Getting Started" videos
 - Support for Subversion VCS
- Toad for Oracle Professional**
Built with a focus on building code with for quality and maintainability
Includes all functionality in the Toad for Oracle base edition, plus:
 - Code Xpert
 - Export File Browser*New for Toad for Oracle 9.7:*
 - Data generator for creating multiple rows of data for one or more Oracle tables for testing
 - "Top 20" rules list for performing a quick code quality check
- Toad for Oracle Xpert**
Designed for developers with SQL tuning responsibilities that focus on database performance
Includes functionality in Toad for Oracle Professional, plus Quest SQL Optimizer for Oracle:
 - Automated SQL optimization
 - SQL scanning
 - Virtual index generation*New for Toad for Oracle 9.7 - SQL Optimizer 7.4*
 - Better organization and usability in Batch Optimizer
 - New options in tuning lab
 - Summary report for analyzed SQL in SQL Scanner
- Toad Development Suite for Oracle**
Enables Database Development Best Practices and ensures that the best possible code is deployed to production.
Integrated suite of three tools:
 - Toad for Oracle Xpert
 - Quest Code Tester for Oracle
 - Benchmark Factory for Databases Oracle Edition*New for Toad for Oracle 9.7:*
 - Greater workflow integration with Benchmark Factory for Databases allowing trace files to be pushed to Benchmark Factory from Toad to initiate a workload replay test

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(上圖為 TOAD for Oracle 程式開發應用版本說明)



Toad for Oracle 9.7 DBA

- Toad for Oracle DB Admin Module (formerly DBA Module)**
Maintain database health and stability and ensure the best possible performance, while minimizing the impact of changes on the database environment.
New for Toad for Oracle 9.7:
 - Database Browser enhancements
 - StatsPack and AWR advisories
 - Schema compare and synch enhancements
 - Trace File Browser
 - RMAN Script templates
- Toad DBA Suite for Oracle**
Simplify common database administration tasks and become more proactive in solving database-related performance issues before end users are impacted.
The suite includes:
 - Toad for Oracle Xpert, with DB Admin Module
 - Spotlight on Oracle Standard Edition
 - Toad Data Modeler
 - Benchmark Factory for Databases Oracle Edition*New for Toad for Oracle 9.7:*
 - Tighter workflow integration with Benchmark Factory for Databases allowing trace files to be pushed to Benchmark Factory from Toad to initiate a workload replay test

• The DB Admin Module must be purchased with or added onto another edition of Toad for Oracle.

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(上圖為 TOAD for Oracle 資料庫管理應用版本說明)

這一次介紹的 TOAD for Oracle 資料庫健檢報告，放置在 TOAD for Oracle DBA 模組裡的一項功能，在“資料庫健檢報告”這項程式中，區分為四大項設定，共可執行 81 項資料庫問題檢測，其詳細內容如下：

1. Settings (資料庫健檢報告相關設定 10 項)

- Settings**
- Show output only for 'bad' conditions.
- Suppress header for a database when report is empty.
- Include user comments at top of the report output.
- For Items 29, 30, and 31, exclude objects in the 'USERS' tablespace(s).
- Play a custom script at the end of the health check
- Store results in table TOAD_HEALTH_CHECK in database being checked.
- Save results to file: C:\TOAD_DEMO\healthcheck.htm
- Archive results for differences report
- Save differences report to file: C:\TOAD_DEMO\healthcheckdiffs.htm
- Always send results by email as HTML

2. Database (資料庫設定檢查項目 25 項)

- Database**
- List connect time, version info, and a few basic items
- List SGA usage stats
- List archive log info
- Alert.Log - check for ORA-600 errors (all alertlog items require UTL_FILE access)
- Alert.Log - list trace files with errors
- Alert.Log - show summary
- Alert.Log - mark file so next TOAD Health Check against it examines only new items
- Alert.Log - save local copy in User Files dir
- Check redo log sizes and quantities (min. groups: 3; min. members per group: 2)
- List rollback segments with a wait ratio > 1%
- List datafile IO distribution
- List analyzed SYS and SYSTEM objects (pre 10g - can cause bad performance)
- List unanalyzed SYS and SYSTEM objects (10g - can cause bad performance)
- List DB Links which are inaccessible
- List users with SYSTEM as a temporary tablespace
- List users except SYS with SYSTEM as a default tablespace
- List users with a non-existent temporary tablespace
- List users with a non-existent default tablespace
- List tablespaces > 30% fragmented having > 50 total extents
- List tablespaces with < 10% free space remaining
- List segments which can't extend because there is not enough room in the tablespace,
- Verify SYS.AUD\$ isn't in SYSTEM tablespace
- List dictionary managed tablespaces (8i and newer)
- Verify AWR collection interval >= 30 minutes, retention <= 90 days - 10g and newer
- Verify sequence sys.audses\$ has sufficient cache for high login rates

3. Schema (資料庫物件檢查項目 33 項)

- Schema**
- List tables with no primary key
- List tables with no unique key or index
- List non-system tables with > 6 indexes
- List tables with > 100 columns
- List indexes with > 6 columns
- List tables with LONG or LONG RAW datatypes
- List partitioned tables with nonpartitioned indexes
- List tables with max row size > tablespace (or db) block size
- List redundant indexes (same leading columns)
- List primary and unique keys using non-unique indexes - 9i+
- List foreign keys with non-matching column definitions - causes poor performance
- List foreign keys with no matching index on child table - causes locks
- List foreign keys with mix of nullable and not nullable columns
- List unique keys with one or more nullable columns
- List objects with mixed-case names
- List object type counts by owner and tablespace
- List analyzed tables with > 5% chained rows and > 500 total rows
- List analyzed table partitions with > 5% chained rows and > 500 total rows
- List schemas with unanalyzed tables
- List schemas with unanalyzed table partitions
- List schemas with unanalyzed indexes
- List schemas with unanalyzed index partitions
- List segments with a possible poorly sized next extent
- List segments with < 1% of extents remaining and > 10 maxextents
- List segments with > 1000 extents
- List jobs with broken = Y
- List jobs with Next Date < Sysdate
- List jobs which have been running longer than 60 minutes
- List objects for which there is a granted privilege but no corresponding synonym
- List unusable indexes
- List invalid objects
- List package bodies with no associated packages
- List disabled constraints and triggers

4. Vulnerability Assessment (資料庫安全檢查項目 23 項)

 Vulnerability Assessment

- List redundant object privileges with conflicting grant options
- List public synonyms that point to nonexistent objects
- List private synonyms that point to nonexistent objects
- List roles not granted to any role or user
- List profiles not granted to any user
- Check if XML DB is installed
- List hidden users
- List nested roles
- List db links with passwords
- List operating system authenticated users
- List powerful system privileges granted directly to users
- List powerful roles granted directly to users
- List object grants granted directly to users with grant option (follows schema settings)
- List system privileges granted directly to users with admin option (follows schema settings)
- List roles granted directly to users with admin option (follows schema settings)
- List grants on V\$ views granted directly to users (follows schema settings)
- List grants on SYS tables granted directly to users (follows schema settings)
- List usage of vulnerable profiles
- List powerful sys packages granted to PUBLIC
- Check for DBA, RESOURCE, CONNECT roles
- List insecure initialization parameters
- List built-in users which are not expired and locked
- List built-in Oracle or 3rd party users with default passwords

在 TOAD for Oracle 資料庫健檢報告這項功能中除了提供詳細的健檢項目外，還提供了 HTML 格式的健檢資料輸出，讓我們在查詢資料庫健檢結果時，可以有效率的查詢，並且可以透過電子郵件的方式將健檢資料傳送至資料庫管理人員信箱，方便讓我們資料庫管理人員可以在任何場所快速並簡便的獲得該資料庫的健檢結果報告。

83	Roles Granted to Users with Admin Option		44
84	V\$ Views Granted to Directly to Users		407
85	SYS Tables Granted to Directly to Users		119
86	Vulnerable Profiles		2
87	Powerful SYS Packages Granted to Public		7
88	Existence and use of CONNECT, RESOURCE, and DBA roles		3
89	Insecure Initialization Parameters		5
90	Built in users which are not expired and locked		5

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Powerful SYS Packages Granted to Public - ORCL10

```

DBMS_LOB
DBMS_RANDOM
DBMS_SCHEDULER
UTL_FILE
UTL_HTTP
UTL_SMTP
UTL_TCP

```

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Existence and use of CONNECT, RESOURCE, and DBA roles - ORCL10

```

CONNECT granted to 9 users or roles
DBA granted to 6 users or roles
RESOURCE granted to 14 users or roles

```

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Insecure Initialization Parameters - ORCL10

```

resource_limit = FALSE
audit_sys_operations = FALSE
global_names = FALSE
audit_trail = NONE
sql92_security = FALSE

```

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Built in users which are not expired and locked - ORCL10

```

DBSNMP
MGMT_VIEW
SYS
SYSMAN
SYSTEM

```

除了 HTML 的報表提供之外，TOAD for Oracle 資料庫健檢功能還貼心的提供 Diff Since Last Run (與上次資料庫健檢結果比較功能)，讓我們料庫管理人員了解這次執行資料庫檢查與上次的資料庫檢查結果有那些差異性，可以讓我們資料庫管理人員快速的了解資料庫的安全架構是否被有心人士變更，更可以進一步預防駭客入侵竊取資料，以確保資料庫資料安全。

```
[-] Powerful privileges granted directly to users (2)
  [-] 2009/8/21 上午 09:25:22 (2)
    [-] !UNLIMITED TABLESPACE is granted to SCOTT
    [-] !UNLIMITED TABLESPACE is granted to TOAD
  [-] 2009/8/21 上午 09:54:11 (2)
    [-] !UNLIMITED TABLESPACE is granted to SCOTT with ADMIN option
    [-] !UNLIMITED TABLESPACE is granted to TOAD with ADMIN option
[-] Existence and use of CONNECT, RESOURCE, and DBA roles (2)
  [-] 2009/8/21 上午 09:25:22 (1)
    [-] DBA granted to 6 users or roles
  [-] 2009/8/21 上午 09:54:11 (1)
    [-] DBA granted to 8 users or roles
[-] Powerful roles granted directly to users (1)
  [-] 2009/8/21 上午 09:54:11 (2)
    [-] !DBA is granted to SCOTT with ADMIN option
    [-] !DBA is granted to TOAD with ADMIN option
[-] Sys Privs Granted to Users with Admin Option (1)
  [-] 2009/8/21 上午 09:54:11 (2)
    [-] SCOTT has UNLIMITED TABLESPACE
    [-] TOAD has UNLIMITED TABLESPACE
[-] Roles Granted to Users with Admin Option (1)
  [-] 2009/8/21 上午 09:54:11 (2)
    [-] SCOTT has DBA
    [-] TOAD has DBA
[-] Built in users which are not expired and locked (1)
  [-] 2009/8/21 上午 09:54:11 (1)
    [-] SCOTT
```

TOAD for Oracle DBA 模組裡的 Database Health Check 功能，提供了完整的資料庫設定、效能與安全性的檢查，如同我們人一樣，定期到醫院做健康檢查，檢查身體機能，找出身體不適的病因，進而將未成重大疾病的病原體清除，而資料庫健康檢查的目的也是如此，希望透過一連串已知的資料庫弱點檢查設定，來針對資料庫做定期的弱點偵測檢查，找出資料庫的漏洞或效能不彰的原因，而能在資料庫問題尚未嚴重時能先進一步執行處理，以確保資料庫效能與資訊安全。