## Applies to:

Oracle Database - Enterprise Edition - Version 8.1.7.0 to 11.2.0.4 [Release 8.1.7 to 11.2]  
 Information in this document applies to any platform.  
 \*\*\*Checked for relevance on 28-Jan-2013\*\*\*

## Goal

The goal of this note is to understand the rowid structure and to identify the way in which the rowid can be converted into its corresponding values of Data Object Id, Relative File Number, Block Number and Row Number(Slot).

## Fix

The ROWID format used from Oracle 8i onwards is the Extended Rowid Format, which accommodates the Data Object ID as a part of the ROWID. The general format of the ROWID is as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| XXXXXX | XXX | XXXXXX | XXX |
| **Data Object ID** | **Relative File No** | **Block Number** | **Row Number(Slot)** |

Eg:  
 SQL> select rowid from rowid\_example;  
  
 ROWID  
 ------------------  
AAANdqAABAAAPFyAAA  
  
 As per the general format given above:

|  |  |  |  |
| --- | --- | --- | --- |
| AAANdq | AAB | AAAPFy | AAA |
| **Data Object ID** | **Relative File No** | **Block Number** | **Row Number(Slot)** |

ROWIDs are encoded with Base-64 encoding format.  
  
 Base-64 representation is based upon 64 character alphabets. A binary series of zeroes and ones, when grouped together as 6 bits in a set, while converting the binary sets (sets of 6 bits) to decimal, we end up with values between 0 – 63.  
  
 Converting them into Base-64 representation will allow us to compress the sets of 6 bits to one character. The character representation in Base-64 and its corresponding Decimal Sequence is given below table.

|  |  |
| --- | --- |
| **Decimal Sequence** | **Base-64 Representation** |
| 0 – 25 | ‘A’ – ‘ Z’ (A through Z) |
| 26 – 51 | ‘a’ – ‘z’ (a through z) |
| 52 – 61 | ‘0’ – ‘9’ (0 through 9) |
| 62 | ‘+’ |
| 63 | ‘/’ |

Example of converting the rowid AAANdqAABAAAPFyAAA to corresponding values  
  
 Data Object ID part of the rowid : AAANdq  
  
 1. Convert the Base-64 encoded value to corresponding decimal representation as per the table given above. The decimal value is converted to appropriate binary representation with each decimal value represented with 6 bits.

|  |  |  |
| --- | --- | --- |
| **Base-64 Value** | **Decimal Representation** | **Binary Representation** |
| A | 0 | 000000 |
| A | 0 | 000000 |
| A | 0 | 000000 |
| N | 13 | 001101 |
| d | 29 | 011101 |
| q | 42 | 101010 |

(AAANdq) -> (000000 000000 000000 001101 011101 101010)  => (Base-64) -> (Binary)  
  
 2. Convert the binary representation to decimal value to  
  
 (000000000000000000001101011101101010) -> (55146) => (Binary) -> (Decimal)  
  
 The Data Object ID of the table ROWID\_EXAMPLE is 55146.  
  
 SQL>select data\_object\_id from dba\_objects where object\_name='ROWID\_EXAMPLE';  
  
 DATA\_OBJECT\_ID  
 --------------  
 55146  
  
 3. Similarly we can convert the Relative File Number, Block Number and the Row Slot (Number).

Read the conversion below as => (Base-64) -> (Binary) -> (Decimal)  
  
 (AAB) -> (000000 000000 000001) -> (1)   
 (AAAPFy) -> (000000 000000 000000 001111 000101 110010) -> (61810)  
 (AAA) -> (000000 000000 000000) -> (0)  
  
 Using the Relative File Number and the Block Number in the following query we can get the Object Name.

SQL> select segment\_name, segment\_type, owner from dba\_extents where file\_id=1 and 61810 between block\_id and block\_id + blocks - 1;  
  
 SEGMENT\_NAME        SEGMENT\_TYPE   OWNER  
 -------------------------- ------------------     --------------  
 ROWID\_EXAMPLE       TABLE                    SYS  
  
 Finally,

|  |  |  |  |
| --- | --- | --- | --- |
| **Data Object ID** | **Relative File No** | **Block Number** | **Row Slot(Number)** |
| AAANdq | AAB | AAAPFy | AAA |
| 55146 | 1 | 61810 | 0 |

The above mentioned steps help us to convert the ROWID into its corresponding values manually.

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通过rowid得到file\_id,block\_id,owner,object\_name,extent\_id

set serveroutput on  
 declare  
 v\_block\_id number;  
 v\_file\_id number;  
 v\_object\_id number;  
 v\_extent\_id number;  
 v\_object\_name varchar2(30);  
 v\_owner varchar2(30);  
 v\_rowid varchar2(20):='AAAXBUAAEAAAK3/AAA'; ------->>>敲入rowid即可.  
 begin  
 select dbms\_rowid.ROWID\_BLOCK\_NUMBER(v\_rowid),  
        dbms\_rowid.ROWID\_RELATIVE\_FNO(v\_rowid),  
        dbms\_rowid.ROWID\_OBJECT(v\_rowid)  
  into v\_block\_id,v\_file\_id,v\_object\_id  
 from dual;  
  
 select owner,object\_name  
   into v\_owner,v\_object\_name  
 from dba\_objects  
 where data\_object\_id=v\_object\_id;  
  
 select extent\_id into v\_extent\_id  
 from dba\_extents  
 where owner=v\_owner  
 and segment\_name=v\_object\_name  
 and file\_id=v\_file\_id  
 and v\_block\_id between block\_id and block\_id+blocks-1;  
  
 dbms\_output.put\_line('         rowid: '||v\_rowid);  
 dbms\_output.put\_line('       file\_id: '||v\_file\_id);  
 dbms\_output.put\_line('      block\_id: '||v\_block\_id);  
 dbms\_output.put\_line('data\_object\_id: '||v\_object\_id);  
 dbms\_output.put\_line('         owner: '||v\_owner);  
 dbms\_output.put\_line('   object\_name: '||v\_object\_name);  
 dbms\_output.put\_line('     extent\_id: '||v\_extent\_id);  
 end;  
 /  
  
 file\_id: 4  
 block\_id: 44543  
 data\_object\_id: 94292  
 owner: SCOTT  
 object\_name: LOB\_TABLE  
 extent\_id: 0  
  
 PL/SQL procedure successfully completed.

SQL>