ALV Object Model – Hierarchical Sequential List – The Basics

Applies to:

SAP NetWeaver 2004 and SAP NetWeaver 2004s

Summary

In this tutorial, you will learn the basic steps to create a hierarchical-sequential list using the ALV Object Model. For more examples, see any program, which start with SALV*.

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Author Bio

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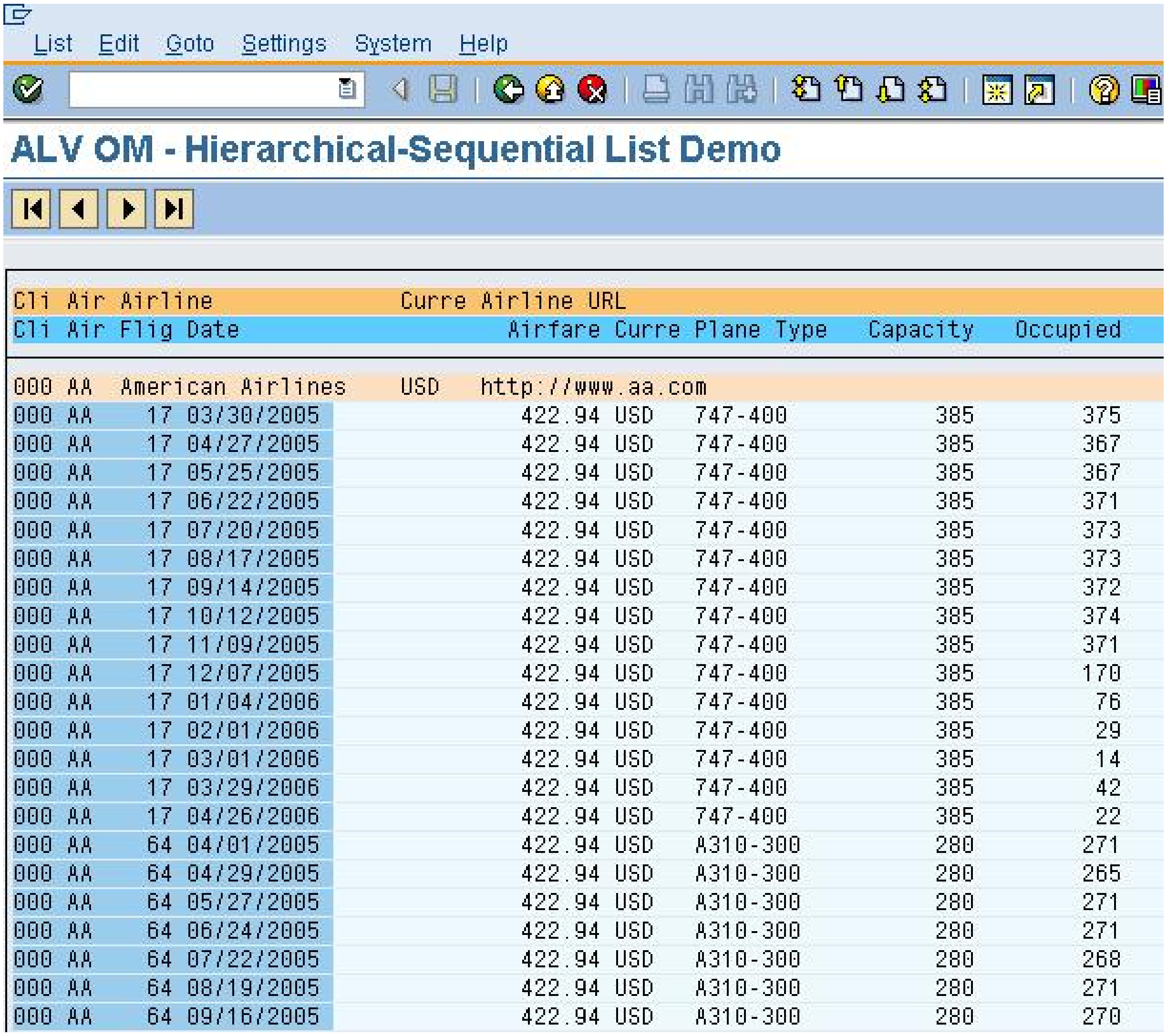
Main Class - CL_SALV_HIERSEQ_TABLE

The main class used to create the hierarchical-sequential list is CL_SALV_HIERSEQ_TABLE. First, create a reference variable for this class. Create two internal tables with types SCARR and SFLIGHT. Fill the internal tables with data from the database. Create the ALV object using the FACTORY method. This method expects that you pass the two internal tables with data and another internal table, which describes the binding of the two internal tables. Create an internal table called IBINDING, and add a record to this internal table as seen below. Create the object of the ALV list using the FACTORY method of the class CL_SALV_HIERSEQ_TABLE, and then call the method DISPLAY to display the list.

```
report  zalv_omhsl_1.

data: gr_table  type ref to cl_salv_hierseq_table.
data: iscarr type table of scarr.
data: isflight type table of sflight.
data: ibinding type salv_t_hierseq_binding.
data: xbinding type salv_s_hierseq_binding.

select * into table iscarr from scarr.
select * into table isflight from sflight.

xbinding-master = 'CARRID'.
xbinding-slave  = 'CARRID'.
append  xbinding to ibinding.

cl_salv_hierseq_table=>factory(
    exporting
      t_binding_level1_level2 = ibinding
    importing
      r_hierseq = gr_table
    changing
      t_table_level1 = iscarr
      t_table_level2 = isflight ).

gr_table->display( ).
```

The output should be similarly to the figure below.



ALV OM - Hierarchical-Sequential List Demo

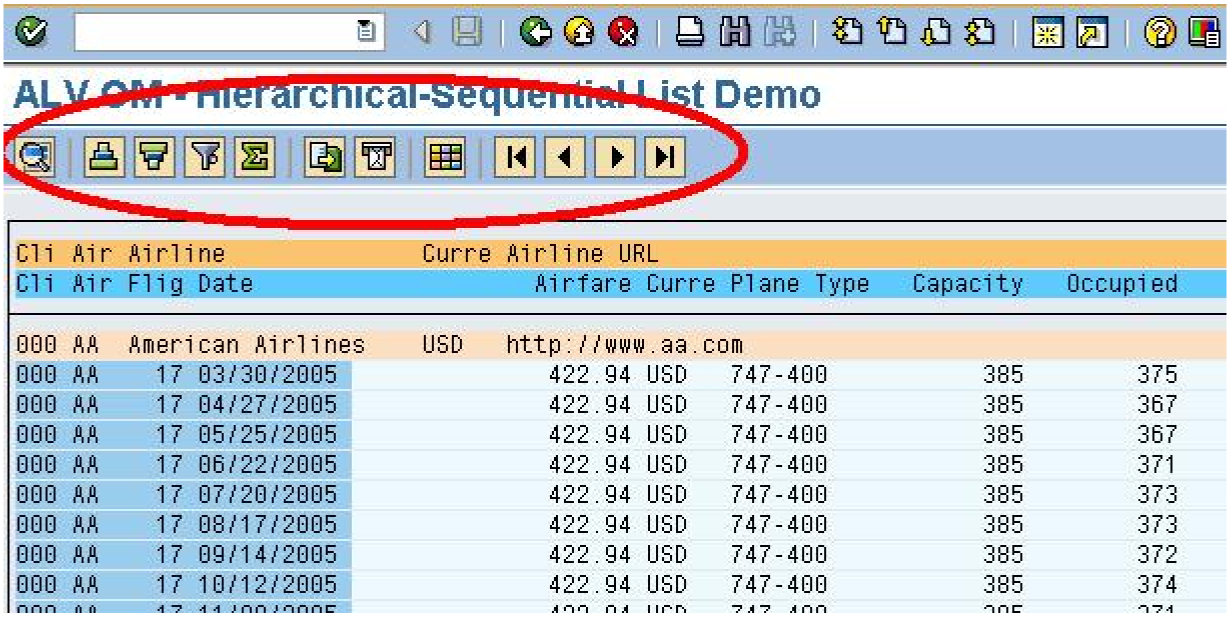
```
Cli Air Airline                Curre Airline URL
Cli Air Flig Date                   Airfare Curre Plane Type   Capacity    Occupied

000 AA  American Airlines      USD   http://www.aa.com
000 AA    17 03/30/2005               422.94 USD   747-400         385         375
000 AA    17 04/27/2005               422.94 USD   747-400         385         367
000 AA    17 05/25/2005               422.94 USD   747-400         385         367
000 AA    17 06/22/2005               422.94 USD   747-400         385         371
000 AA    17 07/20/2005               422.94 USD   747-400         385         373
000 AA    17 08/17/2005               422.94 USD   747-400         385         373
000 AA    17 09/14/2005               422.94 USD   747-400         385         372
000 AA    17 10/12/2005               422.94 USD   747-400         385         374
000 AA    17 11/09/2005               422.94 USD   747-400         385         371
000 AA    17 12/07/2005               422.94 USD   747-400         385         170
000 AA    17 01/04/2006               422.94 USD   747-400         385          76
000 AA    17 02/01/2006               422.94 USD   747-400         385          29
000 AA    17 03/01/2006               422.94 USD   747-400         385          14
000 AA    17 03/29/2006               422.94 USD   747-400         385          42
000 AA    17 04/26/2006               422.94 USD   747-400         385          22
000 AA    64 04/01/2005               422.94 USD   A310-300        280         271
000 AA    64 04/29/2005               422.94 USD   A310-300        280         265
000 AA    64 05/27/2005               422.94 USD   A310-300        280         271
000 AA    64 06/24/2005               422.94 USD   A310-300        280         271
000 AA    64 07/22/2005               422.94 USD   A310-300        280         268
000 AA    64 08/19/2005               422.94 USD   A310-300        280         271
000 AA    64 09/16/2005               422.94 USD   A310-300        280         270
```

Functions – CL_SALV_FUNCTIONS

Next, add functions to the application toolbar. For this, use the CL_SALV_FUNCTIONS class. Create the object reference variable and receive the object using the GET_FUNCTIONS method of the GR_TABLE object. Call the method SET_ALL to force the ALV grid to show all standard functions.

```
report  zalv_omhsl_1.

data: gr_table  type ref to cl_salv_hierseq_table.
data: gr_functions type ref to cl_salv_functions.

data: iscarr type table of scarr.
data: isflight type table of sflight.

data: ibinding type salv_t_hierseq_binding.
data: xbinding type salv_s_hierseq_binding.

select * into table iscarr from scarr.
select * into table isflight from sflight.

xbinding-master = 'CARRID'.
xbinding-slave  = 'CARRID'.
append  xbinding to ibinding.

cl_salv_hierseq_table=>factory(
    exporting
      t_binding_level1_level2 = ibinding
    importing
      r_hierseq = gr_table
    changing
      t_table_level1 = iscarr
      t_table_level2 = isflight ).

gr_functions = gr_table->get_functions( ).
gr_functions->set_all( abap_true ).

gr_table->display( ).
```

The output should be similarly to the figure below.



ALV OM - Hierarchical-Sequential List Demo

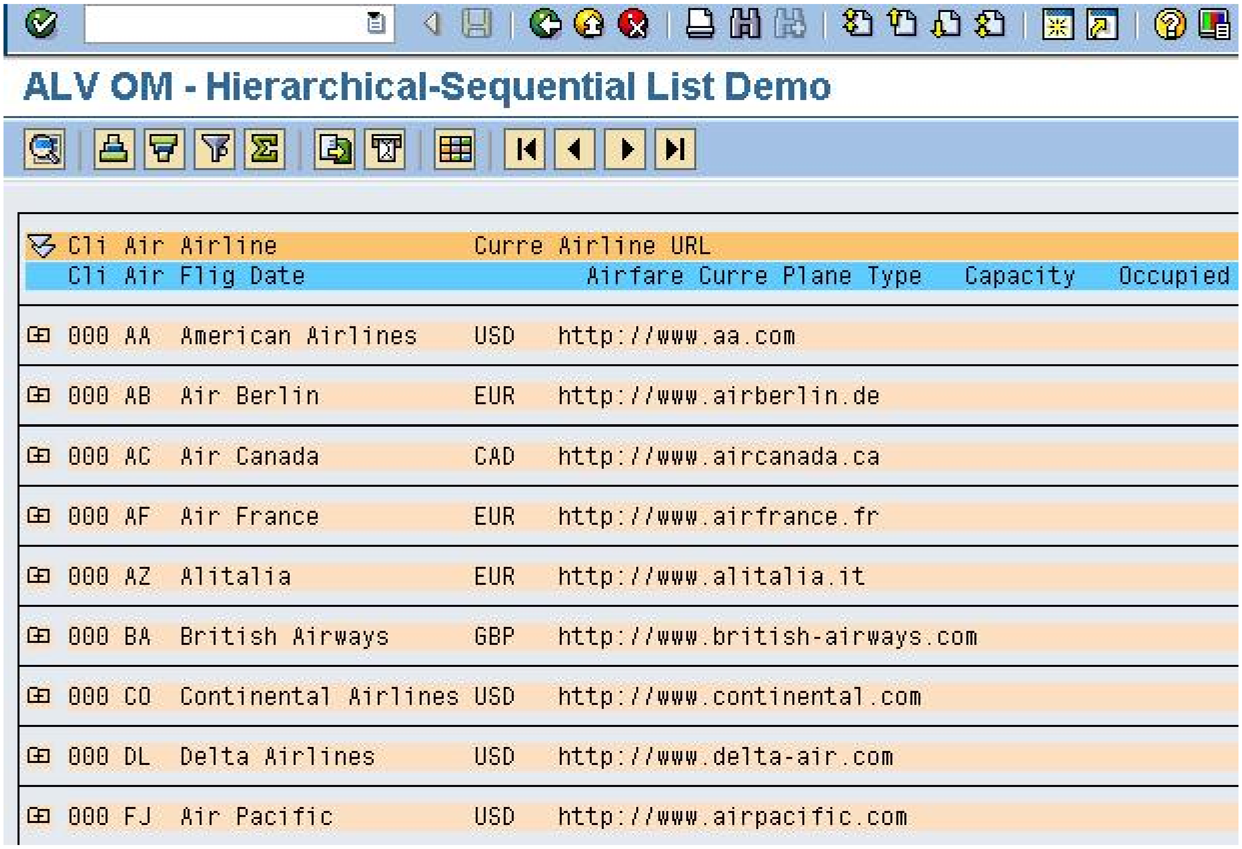
```
Cli Air Airline               Curre Airline URL
Cli Air Flig Date                     Airfare Curre Plane Type   Capacity   Occupied

000 AA  American Airlines     USD   http://www.aa.com
000 AA    17 03/30/2005            422.94 USD   747-400           385        375
000 AA    17 04/27/2005            422.94 USD   747-400           385        367
000 AA    17 05/25/2005            422.94 USD   747-400           385        367
000 AA    17 06/22/2005            422.94 USD   747-400           385        371
000 AA    17 07/20/2005            422.94 USD   747-400           385        373
000 AA    17 08/17/2005            422.94 USD   747-400           385        373
000 AA    17 09/14/2005            422.94 USD   747-400           385        372
000 AA    17 10/12/2005            422.94 USD   747-400           385        374
000 AA    17 11/09/2005            422.94 USD   747-400           385        371
```

Columns – CL_SALV_COLUMNS_HIERSEQ

Using the class CL_SALV_COLUMNS_HIERSEQ, we can manipulate the columns of the table, for example, providing the expand/collapse functionality.   First, we need to add a field to the internal table called ISCARR. This field will be used to toggle the expand/collapse functionality.   Create a TYPE statement, which describes the structure as you see below.   Next, create reference variables for GR_COLUMNS and GR_COLUMN. Modify the internal table declaration to use the new type, which you defined earlier. Receive the object GR_COLUMNS using the method GET_COLUMNS of the object GR_TABLE. Next, use the method SET_EXPAND_COLUMN to set the specific column used for toggling the expand/collapse functionality.

```
report  zalv_omhsl_1.

types: begin of t_scarr.
        include structure scarr.
types: expcol type c.
types: end of t_scarr.

data: gr_table  type ref to cl_salv_hierseq_table.
data: gr_functions type ref to cl_salv_functions.

data: gr_columns type ref to cl_salv_columns_hierseq.
data: gr_column  type ref to cl_salv_column_hierseq.

data: iscarr type table of t_scarr.
data: isflight type table of sflight.

data: ibinding type salv_t_hierseq_binding.
data: xbinding type salv_s_hierseq_binding.

select * into table iscarr from scarr.
select * into table isflight from sflight.

xbinding-master = 'CARRID'.
xbinding-slave  = 'CARRID'.
append  xbinding to ibinding.

cl_salv_hierseq_table=>factory(
    exporting t_binding_level1_level2 = ibinding
    importing r_hierseq = gr_table
    changing
      t_table_level1 = iscarr
      t_table_level2 = isflight ).

gr_functions = gr_table->get_functions( ).
gr_functions->set_all( abap_true ).

gr_columns = gr_table->get_columns( level = 1 ).
gr_columns->set_expand_column( 'EXPCOL' ).

gr_table->display( ).
```

The output should be similarly to the figure below.



ALV OM - Hierarchical-Sequential List Demo

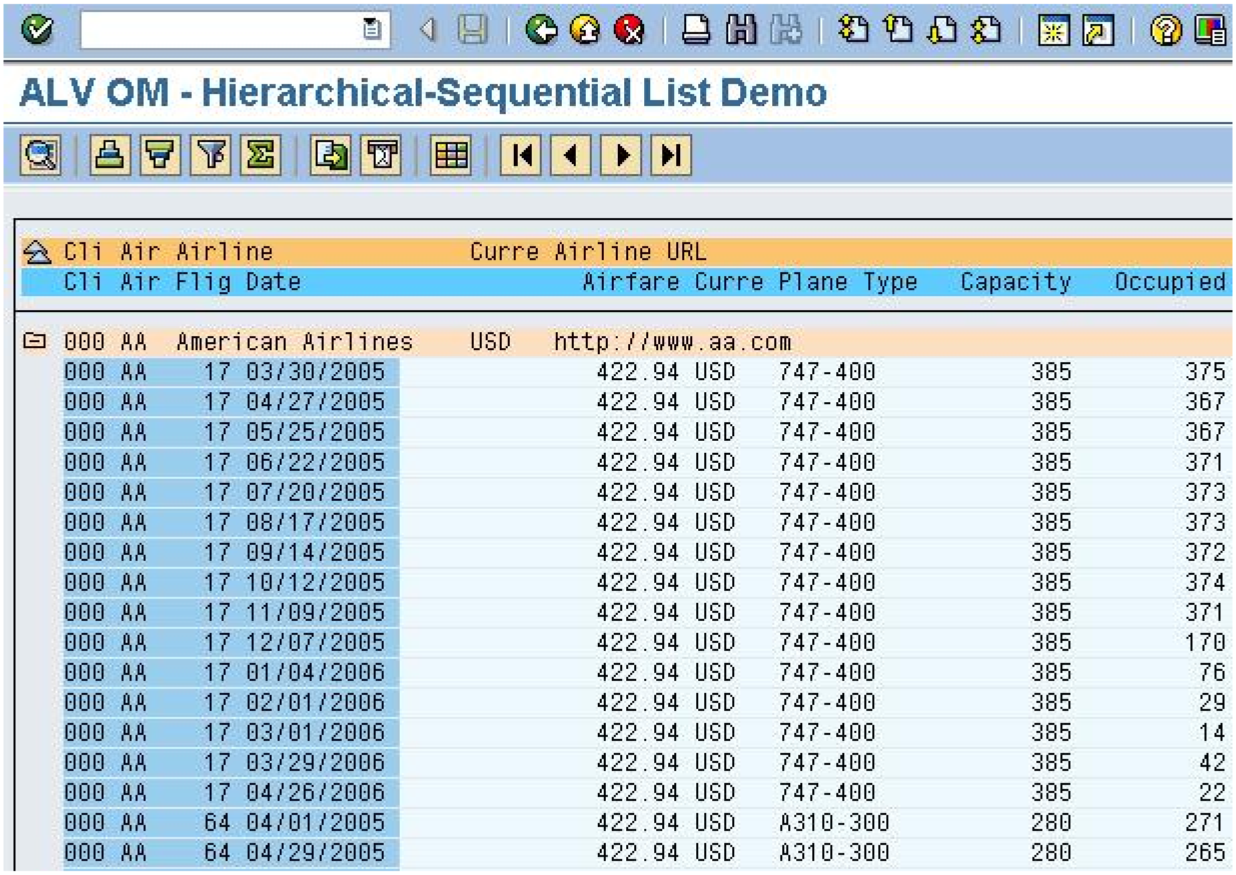
```
  Cli Air Airline               Curre Airline URL
  Cli Air Flig Date                     Airfare Curre Plane Type    Capacity    Occupied

  000 AA  American Airlines     USD   http://www.aa.com
  000 AB  Air Berlin            EUR   http://www.airberlin.de
  000 AC  Air Canada            CAD   http://www.aircanada.ca
  000 AF  Air France            EUR   http://www.airfrance.fr
  000 AZ  Alitalia              EUR   http://www.alitalia.it
  000 BA  British Airways       GBP   http://www.british-airways.com
  000 CO  Continental Airlines USD   http://www.continental.com
  000 DL  Delta Airlines        USD   http://www.delta-air.com
  000 FJ  Air Pacific           USD   http://www.airpacific.com
```

Levels – CL_SALV_HIERSEQ_LEVEL

The next requirement is that the user wants the expand/collapse functionality but wants all items to be expanded by default. To do this, we will use the class CL_SALV_HIERSEQ_LEVEL. Create the reference variable GR_LEVEL. Next receive the object from the GET_LEVEL method of the GR_TABLE object. Call the SET_ITEMS_EXPANDED method.

```
report  zalv_omhsl_1.

types: begin of t_scarr.
        include structure scarr.
types: expcol type c.
types: end of t_scarr.

data: gr_table  type ref to cl_salv_hierseq_table.
data: gr_functions type ref to cl_salv_functions.
data: gr_columns type ref to cl_salv_columns_hierseq.
data: gr_column  type ref to cl_salv_column_hierseq.

data: gr_level type ref to cl_salv_hierseq_level.

data: iscarr type table of t_scarr.
data: isflight type table of sflight.
data: ibinding type salv_t_hierseq_binding.
data: xbinding type salv_s_hierseq_binding.

select * into table iscarr from scarr.
select * into table isflight from sflight.

xbinding-master = 'CARRID'.
xbinding-slave  = 'CARRID'.
append  xbinding to ibinding.

cl_salv_hierseq_table=>factory(
    exporting t_binding_level1_level2 = ibinding
    importing r_hierseq = gr_table
    changing
      t_table_level1 = iscarr
      t_table_level2 = isflight ).

gr_functions = gr_table->get_functions( ).
gr_functions->set_all( abap_true ).

gr_columns = gr_table->get_columns( level = 1 ).
gr_columns->set_expand_column( 'EXPCOL' ).

gr_level = gr_table->get_level( 1 ).
gr_level->set_items_expanded( ).

gr_table->display( ).
```

The output should be similarly to the figure below.



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```
Cli Air Airline               Curre Airline URL
Cli Air Flig Date                   Airfare Curre Plane Type    Capacity    Occupied

000 AA  American Airlines     USD   http://www.aa.com
000 AA    17 03/30/2005              422.94 USD   747-400           385         375
000 AA    17 04/27/2005              422.94 USD   747-400           385         367
000 AA    17 05/25/2005              422.94 USD   747-400           385         367
000 AA    17 06/22/2005              422.94 USD   747-400           385         371
000 AA    17 07/20/2005              422.94 USD   747-400           385         373
000 AA    17 08/17/2005              422.94 USD   747-400           385         373
000 AA    17 09/14/2005              422.94 USD   747-400           385         372
000 AA    17 10/12/2005              422.94 USD   747-400           385         374
000 AA    17 11/09/2005              422.94 USD   747-400           385         371
000 AA    17 12/07/2005              422.94 USD   747-400           385         170
000 AA    17 01/04/2006              422.94 USD   747-400           385          76
000 AA    17 02/01/2006              422.94 USD   747-400           385          29
000 AA    17 03/01/2006              422.94 USD   747-400           385          14
000 AA    17 03/29/2006              422.94 USD   747-400           385          42
000 AA    17 04/26/2006              422.94 USD   747-400           385          22
000 AA    64 04/01/2005              422.94 USD   A310-300          280         271
000 AA    64 04/29/2005              422.94 USD   A310-300          280         265
```

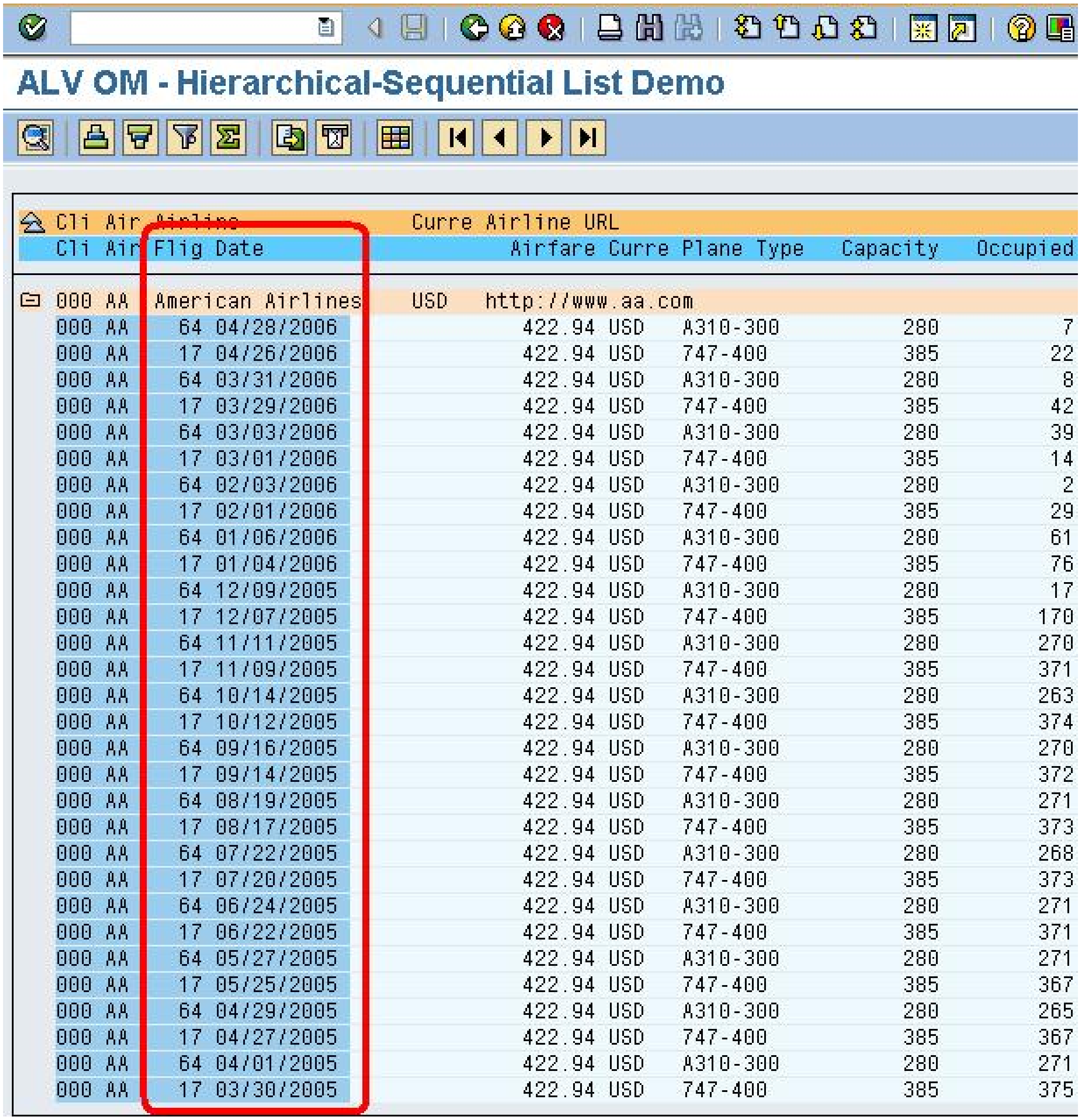
Sorts – CL_SALV_SORTS

The next requirement is that the output should show the detail data sorted by Flight Date in descending order. For this, we will utilize the class CL_SALV_SORTS. Receive the object from the GET_SORTS method of the object GR_TABLE, specifying the LEVEL. Then call the method ADD_SORTS of the object GR_SORTS, specifying the column name and the sequence.

```
report  zalv_omhsl_1.

types: begin of t_scarr.
        include structure scarr.
types: expcol type c.
types: end of t_scarr.

data: gr_table  type ref to cl_salv_hierseq_table.
data: gr_functions type ref to cl_salv_functions.

data: gr_columns type ref to cl_salv_columns_hierseq.
data: gr_column  type ref to cl_salv_column_hierseq.

data: gr_level type ref to cl_salv_hierseq_level.

data: gr_sorts type ref to cl_salv_sorts.

data: iscarr type table of t_scarr.
data: isflight type table of sflight.

data: ibinding type salv_t_hierseq_binding.
data: xbinding type salv_s_hierseq_binding.

select * into table iscarr from scarr.
select * into table isflight from sflight.

xbinding-master = 'CARRID'.
xbinding-slave  = 'CARRID'.
append  xbinding to ibinding.

cl_salv_hierseq_table=>factory(
    exporting
      t_binding_level1_level2 = ibinding
    importing
      r_hierseq = gr_table
    changing
      t_table_level1 = iscarr
      t_table_level2 = isflight ).

gr_functions = gr_table->get_functions( ).
gr_functions->set_all( abap_true ).

gr_columns = gr_table->get_columns( level = 1 ).
gr_columns->set_expand_column( 'EXPCOL' ).

gr_level = gr_table->get_level( 1 ).
gr_level->set_items_expanded( ).

gr_sorts = gr_table->get_Sorts( level = '2' ).
```

```
gr_sorts->add_sort( columnname = 'FLDATE'
                    sequence = if_salv_c_sort=>sort_down ).

gr_table->display( ).
```

The output should be similarly to the figure below.



ALV OM - Hierarchical-Sequential List Demo

```
  Cli Air Airline                Curre Airline URL
  Cli Air Flig Date                     Airfare Curre Plane Type   Capacity   Occupied

  000 AA  American Airlines      USD   http://www.aa.com
  000 AA    64 04/28/2006                422.94 USD   A310-300          280          7
  000 AA    17 04/26/2006                422.94 USD   747-400           385         22
  000 AA    64 03/31/2006                422.94 USD   A310-300          280          8
  000 AA    17 03/29/2006                422.94 USD   747-400           385         42
  000 AA    64 03/03/2006                422.94 USD   A310-300          280         39
  000 AA    17 03/01/2006                422.94 USD   747-400           385         14
  000 AA    64 02/03/2006                422.94 USD   A310-300          280          2
  000 AA    17 02/01/2006                422.94 USD   747-400           385         29
  000 AA    64 01/06/2006                422.94 USD   A310-300          280         61
  000 AA    17 01/04/2006                422.94 USD   747-400           385         76
  000 AA    64 12/09/2005                422.94 USD   A310-300          280         17
  000 AA    17 12/07/2005                422.94 USD   747-400           385        170
  000 AA    64 11/11/2005                422.94 USD   A310-300          280        270
  000 AA    17 11/09/2005                422.94 USD   747-400           385        371
  000 AA    64 10/14/2005                422.94 USD   A310-300          280        263
  000 AA    17 10/12/2005                422.94 USD   747-400           385        374
  000 AA    64 09/16/2005                422.94 USD   A310-300          280        270
  000 AA    17 09/14/2005                422.94 USD   747-400           385        372
  000 AA    64 08/19/2005                422.94 USD   A310-300          280        271
  000 AA    17 08/17/2005                422.94 USD   747-400           385        373
  000 AA    64 07/22/2005                422.94 USD   A310-300          280        268
  000 AA    17 07/20/2005                422.94 USD   747-400           385        373
  000 AA    64 06/24/2005                422.94 USD   A310-300          280        271
  000 AA    17 06/22/2005                422.94 USD   747-400           385        371
  000 AA    64 05/27/2005                422.94 USD   A310-300          280        271
  000 AA    17 05/25/2005                422.94 USD   747-400           385        367
  000 AA    64 04/29/2005                422.94 USD   A310-300          280        265
  000 AA    17 04/27/2005                422.94 USD   747-400           385        367
  000 AA    64 04/01/2005                422.94 USD   A310-300          280        271
  000 AA    17 03/30/2005                422.94 USD   747-400           385        375
```

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