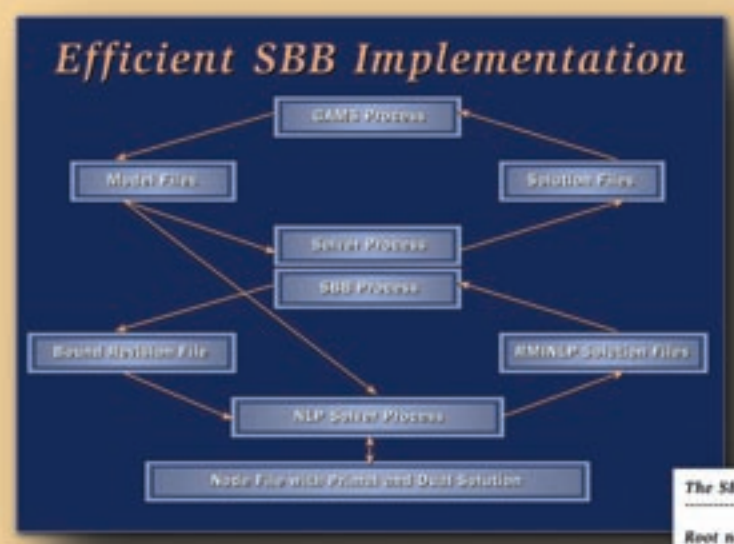
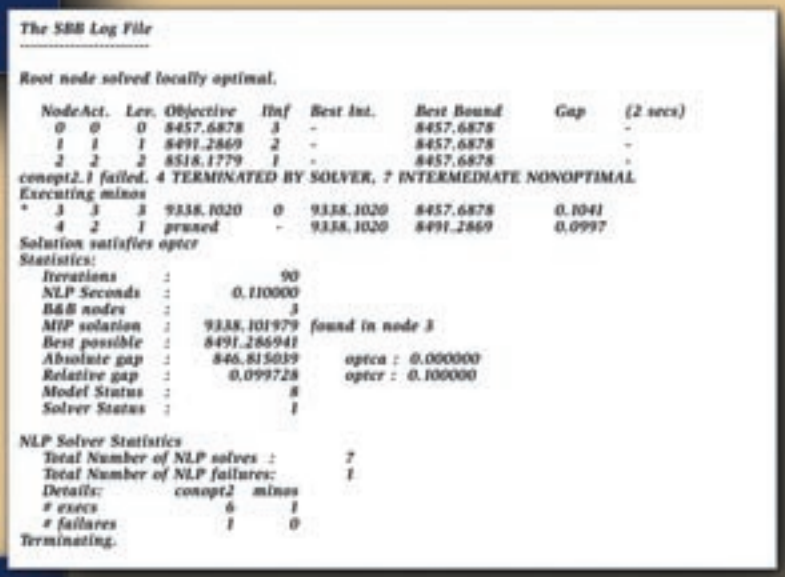
GAMS/SBB

GAMS



SBB is a new GAMS solver for Mixed Integer Nonlinear Programming (MINLP) models. It is based on a combination of the standard Branch and Bound method known from Mixed Integer Linear Programming and the standard NLP solvers already supported by GAMS.

Unlike MIP problems it is quite usual that a node cannot be solved by the NLP solver. SBB is designed to prevent the failure of the overall algorithm. The SBB option "failseq" allows one to try different solvers with different options before giving up on a node and losing part of the solution space.

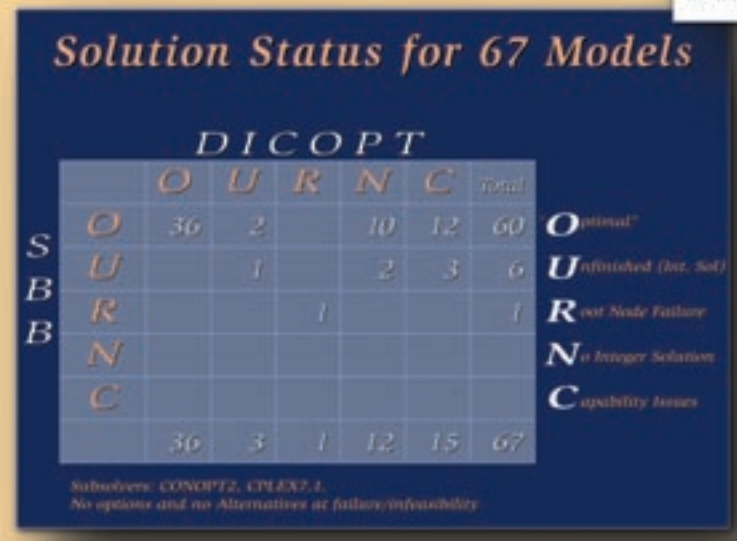


The SBB Log File

```
Root node solved locally optimal.

  NodeAct.  Lev. Objective    Ninf  Best Int.     Best Bound      Gap     (2 secs)
     0   0    0  8457.6878     3     -           8457.6878                   -
     1   1    1  8491.2869     2     -           8457.6878                   -
     2   2    2  8518.1779     1     -           8457.6878                   -
conopt2.1 failed. 4 TERMINATED BY SOLVER, 7 INTERMEDIATE NONOPTIMAL
Executing minos
*    3   3    3  9338.1020     0   9338.1020     8457.6878   0.1041
     4   2    1  pruned        -   9338.1020     8491.2869   0.0997
Solution satisfies optcr
Statistics:
   Iterations    :          90
   NLP Seconds   :    0.110000
   B&B nodes     :           3
   MIP solution  :  9338.101979  found in node 3
   Best possible :  8491.286941
   Absolute gap  :   846.815039     optca :  0.000000
   Relative gap  :    0.099728     optcr :  0.100000
   Model Status  :           8
   Solver Status :           1

NLP Solver Statistics
   Total Number of NLP solves :           7
   Total Number of NLP failures:          1
   Details:          conopt2   minos
   # execs                 6       1
   # failures              1       0
Terminating.
```



SBB works differently than the other GAMS MINLP solver DICOPT which is based on the outer approximation method. Both solvers complement each other: overall, DICOPT should perform better on models that have a significant and difficult combinatorial part, while SBB may perform better on models that have fewer discrete variables but more difficult nonlinearities and possibly also on models that are fairly non-convex.

SBB has been developed by ARKI Consulting & Development