



ActiveKnowledge™

Performance Acceleration and Access Control



Challenges

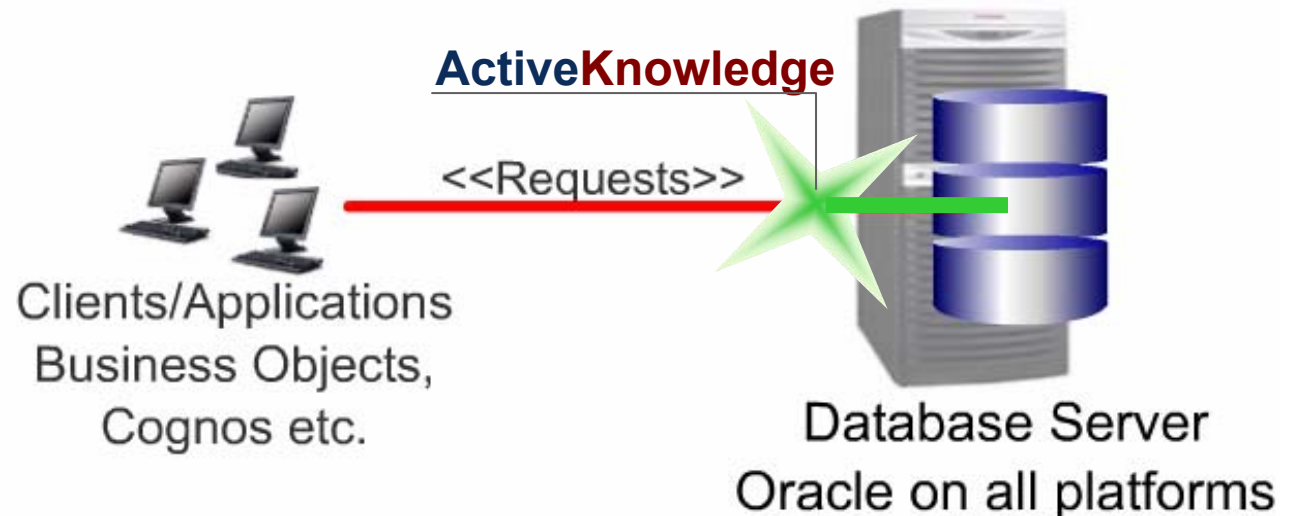
ActiveKnowledge provides large Business Intelligence and reporting environments:

1. Realize order of magnitude improvements in query response times
2. Assure consistent Service Levels (SLA)
3. Increase IT efficiency by auditing and analyzing application usage
4. Apply access control policies, prevent inappropriate and unauthorized information breach



The Solution

- ActiveKnowledge Server software applies performance optimization and access control policies on all incoming statement traffic
- It is installed quickly and transparently, supporting all applications and BI tools on Oracle databases



Accelerate Query Response Time

- ▶ ActiveKnowledge speeds response time of queries and requests **up to x50!!!**
- ▶ Increases database capacity

● How?

1. Identifies and off-line tunes SQL statements, highlighting best execution alternative (Hints)
2. Applies best alternative found as a policy that automatically fixes all similar SQL occurrences in-real-time.



Assure Consistent Service Levels

- Application importance has made acceptable and persistent Service Levels business critical
- ActiveKnowledge warns or blocks ‘query-from-hell’, inappropriate or unauthorized queries before effecting availability
- Guides and trains users for correct usage with automated messages



Increase IT Efficiency

- ▶ Provides centralized view of users and information across the enterprise over time
- ▶ Reduces loading time by analyzing data usage, frequency and by tuning loading scripts
- ▶ Identifies unused software licenses



Access Control and Security

- Controls database access by application names, hosts and users
- Blocks inappropriate or unauthorized queries while notifying the user
- Automatically adds 'Where' clause restrictions and eliminates/encrypts result set columns
- Provides full audit trail



➤ Environment:

- Exceeding 1,000 Data warehouse users, 52 CPU Sun Enterprise with Oracle DB server, Business Objects clients, web clients, 4 broadcast agents

➤ Results:

- Top statements processed by ActiveBase were improved by x5 – x50 times
- Up to 30% overall average response time improvement
- Reduced database CPU load by over 10%



Using ActiveKnowledge

- **Step 1:** Tunes and benchmarks business important and top SQL statements
- **Step 2:** Applies rule that automatically fixes the SQL in-real-time according to partial or full text/syntax/execution-plan/cost match



Step 1: Tune and benchmark

ActiveBase Expert For Database: Vision

Parsing schema

SQL for analyzing:

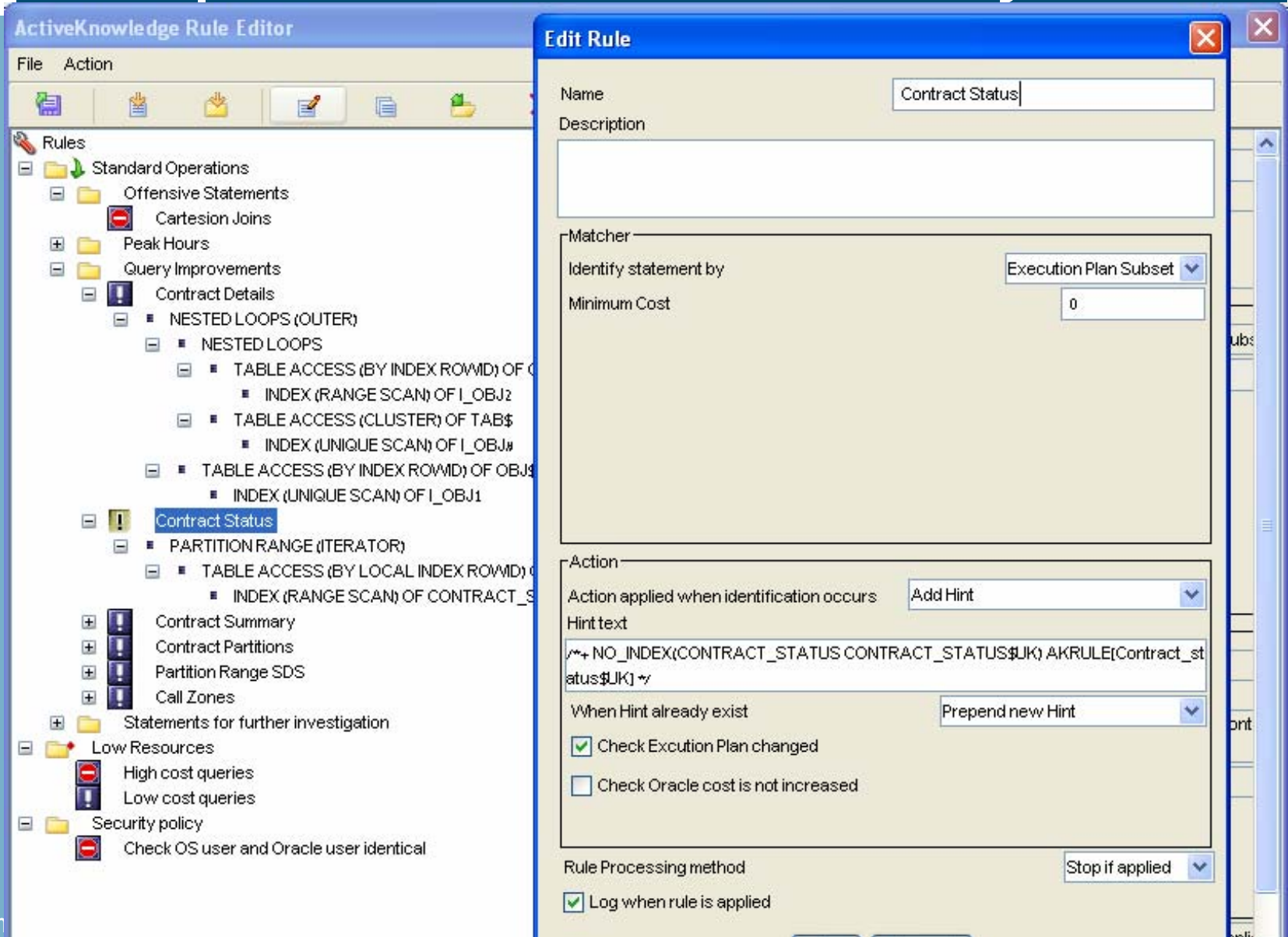
```
SELECT CUSTOMERS.CUSTOMER_NAME Customer, CONTRACT.CONTRACT_CODE Contract, ACTIVITY.ACTIVITY_CODE
Activity, ACTUAL_WORK.WORK_MONTH Month, ACTUAL_WORK.WORK_MAN_MONTH Man_month, ACTUAL_WORK.type
type, BUD_WORK_PLAN.WORK_PLAN_MONTH, BUD_WORK_PLAN.WORK_PLAN_MAN_MONTH, CUSTOMERS.CUSTOMER_CODE Customer_code
FROM CUSTOMERS, CONTRACT, ACTIVITY, ACTUAL_WORK, BUD_WORK_PLAN WHERE
ACTIVITY.ACTIVITY_CODE >= 2 and
(CUSTOMERS.CUSTOMER_CODE = CONTRACT.CUSTOMER_CODE(+)) AND
(CONTRACT.CONTRACT_CODE = ACTIVITY.CONTRACT_CODE(+)) AND
(ACTIVITY.ACTIVITY_CODE = ACTUAL_WORK.ACTIVITY_CODE) AND
(ACTUAL_WORK.WORK_MONTH <= 5) AND
(ACTIVITY.ACTIVITY_CODE = BUD_WORK_PLAN.ACTIVITY_CODE) AND
```

Analyzer Levels:

No. ...	Exe...	Hint	Oracle Cost	Exe...	Elapsed Ti...	Buffer Gets	Disk Reads	Sorts	Rows	Executi...	Executi...
30	<input checked="" type="checkbox"/>	Original Statement	2544		16.964	5500	8304	0	162145	1	1
18	<input checked="" type="checkbox"/>	USE_MERGE(ACTIVITY C...	5545		12.196	5500	5825	2	162145	1	1
32	<input checked="" type="checkbox"/>	USE_MERGE(ACTUAL_W...	9051		11.607	5512	5784	6	162145	1	1
24	<input checked="" type="checkbox"/>	USE_MERGE(CUSTOMER...	9051		11.414	5512	5780	4	162145	1	1
23	<input checked="" type="checkbox"/>	USE_MERGE(ACTUAL_W...	6051		11.32	5510	4743	4	162145	1	1
17	<input checked="" type="checkbox"/>	USE_MERGE(CUSTOMER...	6050		11.024	5510	4743	2	162145	1	1
9	<input checked="" type="checkbox"/>	USE_MERGE(ACTIVITY B...	12119		10.528	5504	5703	4	162145	1	1
37	<input checked="" type="checkbox"/>	USE_MERGE(CONTRACT ...	12120		10.45	5504	5705	6	162145	1	1
3	<input checked="" type="checkbox"/>	USE_MERGE(BUD_WORK...	13387		7.746	5506	5005	5	162145	1	1
1	<input checked="" type="checkbox"/>	INDEX_FFS(CUSTOMERS ...	2544		0.0	0	0	0	0	0	0
2	<input checked="" type="checkbox"/>	USE_NL(ACTUAL_WORK ...	15384017		0.0	0	0	0	0	0	0
4	<input checked="" type="checkbox"/>	USE_NL(BUD_WORK_PL...	5488		0.0	0	0	0	0	0	0
5	<input checked="" type="checkbox"/>	LEADING(CUSTOMERS)	2042		0.0	0	0	0	0	0	0

Selected 38/38

Step 2: Applying rule for fixing the problem automatically



The screenshot shows the ActiveKnowledge Rule Editor interface. The left pane displays a tree view of rules, with 'Contract Status' selected under 'Query Improvements'. The right pane shows the 'Edit Rule' dialog for 'Contract Status'.

ActiveKnowledge Rule Editor

File Action

Rules

- Standard Operations
 - Offensive Statements
 - Cartesian Joins
 - Peak Hours
 - Query Improvements
 - Contract Status**
 - NESTED LOOPS (OUTER)
 - NESTED LOOPS
 - TABLE ACCESS (BY INDEX ROWID) OF ...
 - INDEX (RANGE SCAN) OF I_OBJ2
 - TABLE ACCESS (CLUSTER) OF TAB\$
 - INDEX (UNIQUE SCAN) OF I_OBJ#
 - TABLE ACCESS (BY INDEX ROWID) OF OBJ\$
 - INDEX (UNIQUE SCAN) OF I_OBJ1
 - TABLE ACCESS (BY LOCAL INDEX ROWID) OF ...
 - INDEX (RANGE SCAN) OF CONTRACT_S
 - Contract Summary
 - Contract Partitions
 - Partition Range SDS
 - Call Zones
 - Statements for further investigation
 - Low Resources
 - High cost queries
 - Low cost queries
 - Security policy
 - Check OS user and Oracle user identical

Edit Rule

Name: Contract Status

Description:

Matcher

Identify statement by: Execution Plan Subset

Minimum Cost: 0

Action

Action applied when identification occurs: Add Hint

Hint text: /*+ NO_INDEX(CONTRACT_STATUS CONTRACT_STATUS\$UK) AKRULE(Contract_status\$UK) */

When Hint already exist: Prepend new Hint

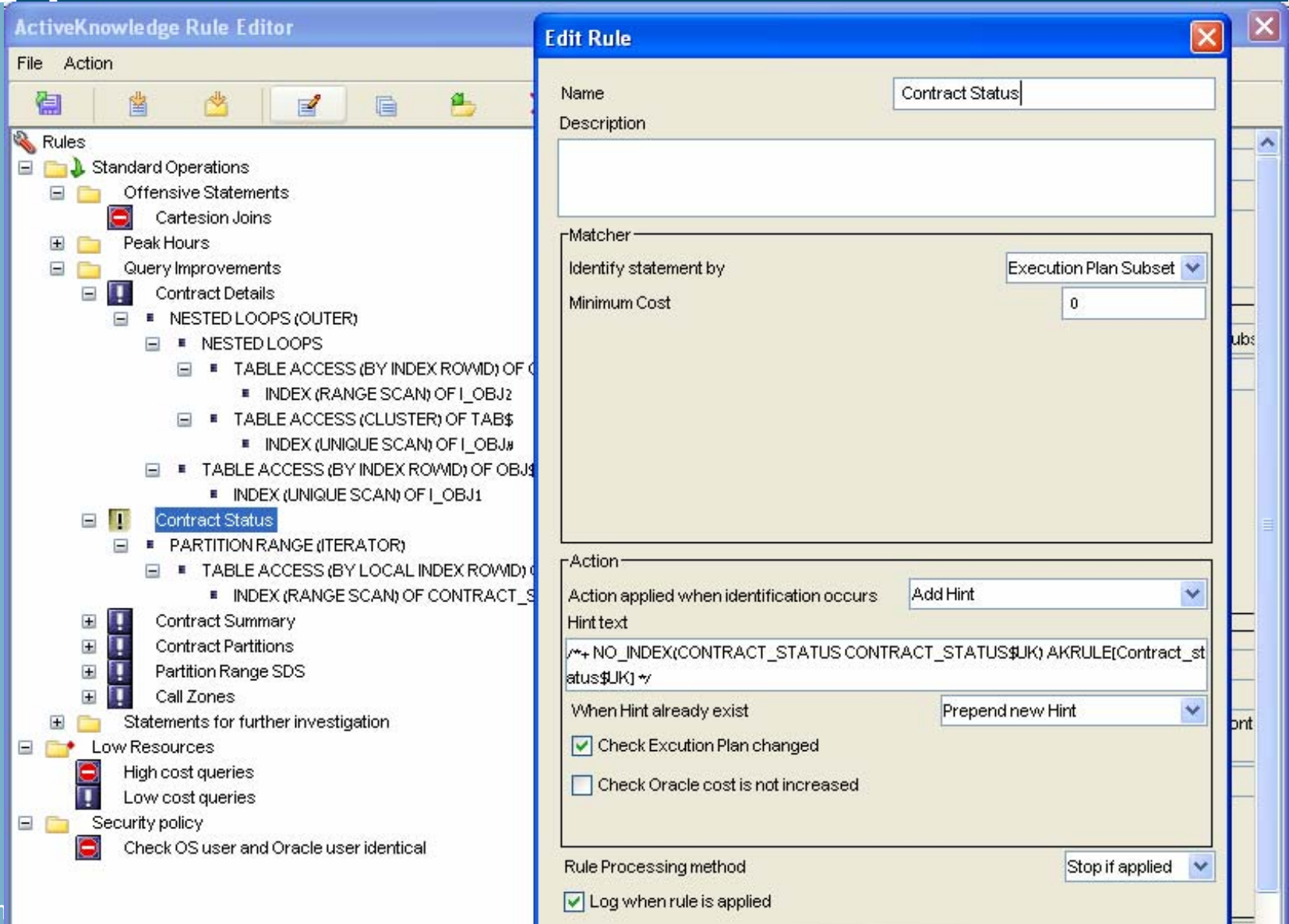
Check Execution Plan changed

Check Oracle cost is not increased

Rule Processing method: Stop if applied

Log when rule is applied

Policy Management layer presentation



The image shows the ActiveKnowledge Rule Editor interface. On the left is a tree view of rules, and on the right is the 'Edit Rule' dialog for the 'Contract Status' rule.

ActiveKnowledge Rule Editor

File Action

Rules

- Standard Operations
 - Offensive Statements
 - Cartesion Joins
 - Peak Hours
 - Query Improvements
 - Contract Details
 - NESTED LOOPS (OUTER)
 - NESTED LOOPS
 - TABLE ACCESS (BY INDEX ROWID) OF C
 - INDEX (RANGE SCAN) OF I_OBJ2
 - TABLE ACCESS (CLUSTER) OF TAB\$
 - INDEX (UNIQUE SCAN) OF I_OBJ#
 - TABLE ACCESS (BY INDEX ROWID) OF OBJ\$
 - INDEX (UNIQUE SCAN) OF I_OBJ1
 - Contract Status (selected)
 - PARTITION RANGE (ITERATOR)
 - TABLE ACCESS (BY LOCAL INDEX ROWID) OF C
 - INDEX (RANGE SCAN) OF CONTRACT_S
 - Contract Summary
 - Contract Partitions
 - Partition Range SDS
 - Call Zones
 - Statements for further investigation
 - Low Resources
 - High cost queries
 - Low cost queries
 - Security policy
 - Check OS user and Oracle user identical

Edit Rule

Name

Contract Status

Description

Matcher

Identify statement by

Execution Plan Subset

Minimum Cost

0

Action

Action applied when identification occurs

Add Hint

Hint text

```
/*+ NO_INDEX(CONTRACT_STATUS CONTRACT_STATUS$UK) AKRULE(Contract_status$UK) */
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When Hint already exist

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Rule Processing method

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Thank You!

Please visit us:
www.active-base.com

