

Cedar 项目组测试文档	
文档名称	Hash join 测试案例
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功能模块	Hash join
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日期	20170621
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修订记录：

日期	修改描述
20170621	创建文档
20170722	完善文档
20170916	回归测试

硬件配置：

机器 IP	硬件配置
10.11.1.190-10.11.1.198	<p>CPU: Intel(R) Xeon(R) CPU E5-2620 * 2, 2*6*2 个线程, 主频 2000MHz- 2500MHz, L3 缓存 15MB;</p> <p>内存: 168GB、152GB、158 GB、168GB、80GB、144GB、128 GB、112 GB、144 GB、128 GB;</p> <p>网络带宽: 1000Mb/s (有少数部分机器之间的网络带宽为 100Mb/s);</p> <p>磁盘 IOPS: 76*4=304, 磁盘带宽 400MB/s、6500MB/s (读缓存)</p>

功能测试案例：

编号	1	配置	197, 单集群, RS+UPS+CS+MS
测试目的	测试基本 JOIN 功能 (where/from 条件-两表连接)		
测试输入	<pre>create table t1(k int primary key, c1 int,c2 varchar(20),c3 int); insert into t1 values(1,1,'aaaa',1),(2,2,'bbbb',1),(3,3,'cccc',1),(4,4,'ee fd',1),(5,5,'ddee',1),(6,6,'bbfee',1),(7,6,'bbfee',1); create table t2(k int primary key, c1 int,c2 varchar(20),c3 int); insert into t2 values(1,1,'aaaa',1),(2,7,'bbbb',1),(3,2,'cccc',1),(4,8,'ee fd',1),(5,1,'ddee',1),(6,16,'bbfee',1);</pre>		

	explain select /*+JOIN(hash_join)*/ * from t1, t2 where t1.k=t2.k; explain select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k; select /*+JOIN(hash_join)*/ * from t1, t2 where t1.k=t2.k; select * from t1, t2 where t1.k=t2.k; select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k;		
测试结果	PASS		
编号	2	配置	197, 单集群, RS+UPS+CS+MS
测试目的	测试基本 JOIN 功能 (where 条件-多表连接)		
测试输入	explain select /*+JOIN(hash_join, MERGE_JOIN)*/ * from t1, t2, t3 where t1.k=t2.k and t2.k=t3.k; ERROR explain select /*+JOIN(hash_join, hash_join, MERGE_JOIN)*/ * from t1, t2, t3, t4 where t2.c3 >0 and t1.k=t2.k and t1.k=t3.k and t3.c1 < 7 and t2.k=t4.k; ERROR explain select /*+JOIN(hash_join, MERGE_JOIN)*/ * from t1 join t2 on t1.k=t2.k, t3 where t2.k=t3.k; ERROR explain select /*+JOIN(hash_join, hash_join, MERGE_JOIN)*/ * from t1 join t2 on t1.k=t2.k, t3 , t4 where t2.c3 >0 and t1.k=t3.k and t3.c1 < 7 and t2.k=t4.k; ERROR		
测试结果	ERROR <pre> +-----+ > lo scf(cofnwuz=[exbl<3004'Ie>=[COF<3004'Ie>]]'exbl<3004'I>]=[COF<3004'I>]]'exbl<3004'I8>=[COF<3004'I8>]]'ex lbc'zc9u=<pbcc2c9u(HIUI=<w9x'b9l9f9f'conuf=J'J'2'def'2ktb'ewbfl'LOM'=fLn6' l69q'wefuodq=J' l69q'cou2f2f6ucA= l9pfefb2c9u(l69q'wefuodq=2CVU'J'2 n26'Jug6x'fol'2folIud=0'Jug6x'fIq=-J'J'2 n26'Jug6x'WfIponf'2folIud=0'Jug6x LIdur'Jou' l9pf6:)> lo scf(cofnwuz=[exbl<3003'Ie>=[COF<3003'Ie>]]'exbl<3003'I>]=[COF<3003'I>]]'exbl<3003'I8>=[COF<3003'I8>]]'ex lbc'zc9u=<pbcc2c9u(HIUI=<w9x'b9l9f9f'conuf=J'J'2'def'2ktb'ewbfl'LOM'=fLn6' l69q'wefuodq=J' l69q'cou2f2f6ucA= l9pfefb2c9u(l69q'wefuodq=2CVU'J'2 n26'Jug6x'fol'2folIud=0'Jug6x'fIq=-J'J'2 n26'Jug6x'WfIponf'2folIud=0'Jug6x LIdur'Jou' l9pf6:)> lo scf(cofnwuz=[exbl<3005'Ie>=[COF<3005'Ie>]]'exbl<3005'I>]=[COF<3005'I>]]'exbl<3005'I8>=[COF<3005'I8>]]'ex lbc'zc9u=<pbcc2c9u(HIUI=<w9x'b9l9f9f'conuf=J'J'2'def'2ktb'ewbfl'LOM'=fLn6' l69q'wefuodq=J' l69q'cou2f2f6ucA= l9pfefb2c9u(l69q'wefuodq=2CVU'J'2 n26'Jug6x'fol'2folIud=0'Jug6x'fIq=-J'J'2 n26'Jug6x'WfIponf'2folIud=0'Jug6x LIdur'Jou' l9pf6: (edn9f'Jou' couq2=[exbl<4nlg'02201>=[COF<3005'Ie> COF<3003'Ie> E0<S>]]]'ofuel'Jou' couq2=[]) H92Jou2Jug6'Jou'Jou' lIbe: lIIMEV'Jou' felc'Jou' l9pf6: (edn9f'Jou' couq2=[exbl<4nlg'02200>=[COF<3003'Ie> COF<3004'Ie> E0<S>]]]'ofuel'Jou' couq2=[]) H92Jou2Jug6'Jou'Jou' lIbe: lIIMEV'Jou' nlg'0221>=[COF<3004'Ie>]]'exbl<4nlg'02210>=[COF<3004'I>]]'exbl<4nlg'02200>=[COF<3004'I8>]]'exbl<4nlg'0220 Ia>]]'exbl<4nlg'02212>=[COF<3003'Ie>]]'exbl<4nlg'02214>=[COF<3003'I>]]'exbl<4nlg'02213>=[COF<3003'I8>]]'exb b o scf(cofnwuz=[exbl<4nlg'02218>=[COF<3005'Ie>]]'exbl<4nlg'02218>=[COF<3005'I>]]'exbl<4nlg'02213>=[COF<300 exb9tu() </pre>		
编号	3	配置	197, 单集群, RS+UPS+CS+MS
测试目的	测试基本 JOIN 功能 (where 条件-多表连接-hint 内数目小于连接数目)		
测试输入	explain select /*+JOIN(hash_join, MERGE_JOIN)*/ * from t1, t2, t3, t4 where t2.c3 >0 and t1.k=t2.k and t1.k=t3.k and t3.c1 < 7 and t2.k=t4.k; explain select /*+JOIN(hash_join, MERGE_JOIN)*/ * from t1 join t2 on t1.k=t2.k, t3 , t4 where t2.c3 >0 and t1.k=t3.k and t3.c1 < 7 and		

	t2.k=t4.k;		
测试结果	<p>ERROR</p> <pre> +-----+ >) lo)ecf(cofnmu2=[exbl<3004'>Ie>=[COF<3004'>Ie>]]'exbl<3004'>I>=[COF<3004'>I>]]'exbl<3004'>I8>=[COF<3004'>I8>]]'ex lbc'2c9u=<ybc2c9u(Htu=<w9x'b9l9f9e'conu=J'>2'de'2ktb'ewbfl'LOM'=fLn6'>L69q'weimuq'=J'>L69q'cou2t2f6ucA= l9rfe9bc2c9u(L69q'weimuq=2CvM'>2 n26 tuqex l0L 2f0Ltu0=0'tuqex lTq=-J'>2 n26 tuqex Mfmuonf 2f0Ltu0=0'tuqex L70uf joTu l9rfe: >) lo)ecf(cofnmu2=[exbl<3003'>Ie>=[COF<3003'>Ie>]]'exbl<3003'>I>=[COF<3003'>I>]]'exbl<3003'>I8>=[COF<3003'>I8>]]'ex lbc'2c9u=<ybc2c9u(Htu=<w9x'b9l9f9e'conu=J'>2'de'2ktb'ewbfl'LOM'=fLn6'>L69q'weimuq'=J'>L69q'cou2t2f6ucA= l9rfe9bc2c9u(L69q'weimuq=2CvM'>2 n26 tuqex l0L 2f0Ltu0=0'tuqex lTq=-J'>2 n26 tuqex Mfmuonf 2f0Ltu0=0'tuqex L70uf joTu l9rfe: >) lo)ecf(cofnmu2=[exbl<3005'>Ie>=[COF<3005'>Ie>]]'exbl<3005'>I>=[COF<3005'>I>]]'exbl<3005'>I8>=[COF<3005'>I8>]]'ex lbc'2c9u=<ybc2c9u(Htu=<w9x'b9l9f9e'conu=J'>2'de'2ktb'ewbfl'LOM'=fLn6'>L69q'weimuq'=J'>L69q'cou2t2f6ucA= l9rfe9bc2c9u(L69q'weimuq=2CvM'>2 n26 tuqex l0L 2f0Ltu0=0'tuqex lTq=-J'>2 n26 tuqex Mfmuonf 2f0Ltu0=0'tuqex L70uf joTu l9rfe: >) (edn9f'joTu'couq2=[exbl<MNG'0220>=[COF<3005'>Ie> COF<3003'>Ie> E0<S>]]]'ofu6L'joTu'couq2=[]) H92j0t02t0d9e joTu(joTu lAb6: lNMEF joTu f6L joTu l9rfe: (edn9f'joTu'couq2=[exbl<MNG'0220>=[COF<3003'>Ie> COF<3004'>Ie> E0<S>]]]'ofu6L'joTu'couq2=[]) H92j0t02t0d9e joTu(joTu lAb6: lNMEF joTu MNG'022I>=[COF<3004'>Ie>]]'exbl<MNG'022I0>=[COF<3004'>I>]]'exbl<MNG'02200>=[COF<3004'>I8>]]'exbl<MNG'0220 Ia>]]'exbl<MNG'022I2>=[COF<3003'>Ie>]]'exbl<MNG'022I4>=[COF<3003'>I>]]'exbl<MNG'022I3>=[COF<3003'>I8>]]'exb bL0l6cf(cofnmu2=[exbl<MNG'022I0>=[COF<3005'>Ie>]]'exbl<MNG'022I8>=[COF<3005'>I>]]'exbl<MNG'022I1>=[COF<300 >Exbf9tu() </pre>		
编号	4	配置	197, 单集群, RS+UPS+CS+MS
测试目的	测试基本 JOIN 功能（where/from 条件-条件过滤）		
测试输入	<p>1) like</p> <pre> explain select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k where t2.c2 like 'bb%' and t1.c1 > 5; explain select /*+JOIN(hash_join)*/ * from t1,t2 where t2.c2 like 'bb%' and t1.k=t2.k and t1.c1 > 5; select /*+JOIN(hash_join)*/ * from t1,t2 where t2.c2 like 'bb%' and t1.k=t2.k and t1.c1 > 5; select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k where t2.c2 like 'bb%' and t1.c1 > 5; select * from t1,t2 where t2.c2 like 'bb%' and t1.k=t2.k and t1.c1 > 5; PASS 2) between, in, not like select /*+JOIN(hash_join)*/ * from t1 , t2 where t1.k=t2.k and t1.c1 between 1 and 8 and t2.c1 in (3, 7, 8) and t1.c1 not in (4,3) and t2.c2 not like 'ff%'; select /*+JOIN(hash_join)*/ * from t1 , t2 where t1.k=t2.k and t1.c1 between 1 and 8 and t2.c1 in (3, 7, 8) and t1.c1 not in (4,3) and t2.c2 not like 'ff%' order by t1.k; select * from t1 , t2 where t1.k=t2.k and t1.c1 between 1 and 8 and t2.c1 in (3, 7, 8) and t1.c1 not in (4,3) and t2.c2 not like 'ff%'; PASS 3) %, not like, in , != select /*+JOIN(hash_join)*/ * from t1 ,t2, t3 where t1.k=t2.k and t1.c1 =t3.c1 and t1.c2 not like 'g%' and t3.c1 in (1, 2, 3, 4, 5, 6, 7, 8, 9) and t3.c2 != 'aa' and t2.k % 2=0; select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k, t3 where </pre>		

t1.c1 = t3.c1 and t1.c2 not like 'g%' and t3.c1 in (1, 2, 3, 4, 5, 6, 7, 8, 9) and t3.c2 != 'aa' and t2.k % 2=0;

```
select * from t1 ,t2, t3 where t1.k=t2.k and t1.c1 = t3.c1 and t1.c2 not like 'g%' and t3.c1 in (1, 2, 3, 4, 5, 6, 7, 8, 9) and t3.c2 != 'aa' and t2.k % 2=0;
```

PASS

4) group order sum

```
explain select /*+JOIN(hash_join, hash_join, hash_join, hash_join, hash_join)*/ sum(t2.k) from t1 left join t2 on t1.k=t2.k inner join t3 on t2.c1=t3.k, t4, t5, t6 where t3.c1 <= 10 and t3.k=t4.k and t5.c1 >= 1 and t4.k = t5.c1 and t5.c2 = t6.c1 group by t2.c2 order by t4.c1 desc;
```

```
select /*+JOIN(hash_join, hash_join, hash_join, hash_join, hash_join)*/ sum(t2.k) from t1 left join t2 on t1.k=t2.k inner join t3 on t2.c1=t3.k, t4, t5, t6 where t3.c1 <= 10 and t3.k=t4.k and t5.c1 >= 1 and t4.k = t5.k and t5.k = t6.k group by t2.c2 order by t4.c1 desc;
```

```
select sum(t2.k) from t1 left join t2 on t1.k=t2.k inner join t3 on t2.c1=t3.k, t4, t5, t6 where t3.c1 <= 10 and t3.k=t4.k and t5.c1 >= 1 and t4.k = t5.k and t5.k = t6.k group by t2.c2 order by t4.c1 desc;
```

5)> <=

```
Explain select /*+JOIN(hash_join)*/ * from t1 left join t2 on t1.k=t2.k where (t1.c1 <> 4 and t2.c1 <= 7) or (t2.c1 = 9) or (t2.c3 = 8);
```

```
select /*+JOIN(hash_join)*/ * from t1 left join t2 on t1.k=t2.k where (t1.c1 <> 4 and t2.c1 <= 7) or (t2.c1 = 9) or (t2.c3 = 8);
```

```
select * from t1 left join t2 on t1.k=t2.k where (t1.c1 <> 4 and t2.c1 <= 7) or (t2.c1 = 9) or (t2.c3 = 8);
```

6)mod

```
Explain select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k where t2.c1 mod 2 = 0 order by t1.k;
```

```
select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k where t2.c1 mod 2 = 0 order by t1.k;
```

```
select /*+JOIN(hash_join)*/ * from t1 , t2 where t1.k=t2.k and t2.c1 mod 2 = 0 order by t1.k;
```

```
select * from t1 join t2 on t1.k=t2.k where t2.c1 mod 2 = 0 order by t1.k;
```

7)not

```
Explain select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k where not t1.c1 > 9;
```

```
select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k where not t1.c1 > 9;
```

```
select /*+JOIN(hash_join)*/ * from t1 , t2 where t1.k=t2.k and not
```

	<p>t1.c1 > 9; select * from t1 join t2 on t1.k=t2.k where not t1.c1 > 9;</p> <p>8) sum Explain select /*+JOIN(hash_join)*/ * from t1 , t2 where t1.k=t2.k and t1.c1 > 5 group by t2.c2 having sum(t2.c1) > 6; select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k where t1.c1 > 5 group by t2.c2 having sum(t2.c1) > 6; select /*+JOIN(hash_join)*/ * from t1 , t2 where t1.k=t2.k and t1.c1 > 5 group by t2.c2 having sum(t2.c1) > 6; select * from t1 join t2 on t1.k=t2.k where t1.c1 > 5 group by t2.c2 having sum(t2.c1) > 6;</p> <p>9) max Explain select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k where t1.c1 > 5 group by t2.c2 having max(t2.c1) > 6; select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k where t1.c1 > 5 group by t2.c2 having max(t2.c1) > 6; select /*+JOIN(hash_join)*/ * from t1 , t2 where t1.k=t2.k and t1.c1 > 5 group by t2.c2 having max(t2.c1) > 6; select * from t1 join t2 on t1.k=t2.k where t1.c1 > 5 group by t2.c2 having max(t2.c1) > 6;</p> <p>10) coalesce Explain select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k where coalesce(t1.c1, t1.k) > 3 order by t1.c1; select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k where coalesce(t1.c1, t1.k) > 3 order by t1.c1; select * from t1 join t2 on t1.k=t2.k where coalesce(t1.c1, t1.k) > 3 order by t1.c1;</p> <p>11) NULL NOT NULL select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.c1=t2.c1 where t1.c1 is NULL; select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.c1=t2.c1 where t1.c1 is not NULL;</p>		
测试结果	PASS		
编号	5	配置	197, 单集群, RS+UPS+CS+MS
测试目的	测试基本 JOIN 功能（不支持语句）		
测试输入	<p>select /*+JOIN(hash_join)*/ * from t1 , t2 where t1.k=t2.k and (t1.c1 <> 4 and t2.c1 <= 7) or (t2.c1 = 9) or (t2.c3 = 8);</p> <p>ERROR 7 (0A000): OB-7: Not supported feature or function</p> <p>select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k and t1.c1 ></p>		

	<p>5;</p> <p>ERROR 7 (0A000): OB-7: Not supported feature or function</p> <p>select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c1+t2.c1>10;</p> <p>ERROR 7 (0A000): OB-7: Not supported feature or function</p> <p>select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k ,t3 where t1.c1=t2.c1 and t3.k=t1.k;</p> <p>ERROR 6 (HY000): OB-6: The object is not initialized</p> <p>select /*+JOIN(hash_join)*/ * from t1 join t1 on t1.k=t1.k;</p> <p>ERROR 5020 (42S01): table t1 is ambiguous</p> <p>select /*+JOIN(hash_join)*/ * from t1, t2 where t1.k=t2.k+1;</p> <p>ERROR 7 (0A000): OB-7: Not supported feature or function</p> <p>select /*+JOIN(hash_join)*/ * from t1, t2 where t1.k+t2.k>10;</p> <p>ERROR 7 (0A000): OB-7: Not supported feature or function</p> <p>select /*+JOIN(hash_join)*/ * from t1, t2 where t1.k>t2.k;</p> <p>ERROR 7 (0A000): OB-7: Not supported feature or function</p> <p>select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=4;</p> <p>ERROR 7 (0A000): OB-7: Not supported feature or function</p>		
测试结果			
编号	6	配置	197, 单集群, RS+UPS+CS+MS
测试目的	测试基本 JOIN 功能 (hint 语法错误/ Hint 内数目小于连接数目)		
测试输入	<p>explain select /*+JOIN(HASH_JOIN)*/ * from t1, t2 where t1.k=t2.k;</p> <p>explain select /*+JOIN()*/ * from t1, t2 where t1.k=t2.k;</p> <p>explain select /*+JOIN(HHHH)*/ * from t1, t2 where t1.k=t2.k;</p> <p>PASS</p> <p>Hint 内数目小于连接数目</p> <p>explain select /*+JOIN(hash_join, MERGE_JOIN)*/ * from t1, t2, t3, t4 where t2.c3 >0 and t1.k=t2.k and t1.k=t3.k and t3.c1 < 7 and t2.k=t4.k;</p> <p>三个 join 都走 hash join</p> <p>explain select /*+JOIN(MERGE_JOIN, hash_join)*/ * from t1, t2, t3, t4 where t2.c3 >0 and t1.k=t2.k and t1.k=t3.k and t3.c1 < 7 and t2.k=t4.k;</p> <p>三个 join 都走 MERGE_JOIN</p>		

	explain select /*+JOIN(hash_join, MERGE_JOIN)*/ * from t1 join t2 on t1.k=t2.k, t3 , t4 where t2.c3 >0 and t1.k=t3.k and t3.c1 < 7 and t2.k=t4.k; MERGE_JOIN, MERGE_JOIN, hash join		
测试结果	ERROR		
编号	7	配置	197, 单集群, RS+UPS+CS+MS
测试目的	测试基本 JOIN 功能（数据类型）		
测试输入	1) varchar join varchar explain select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c2 = t2.c2; select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c2 = t2.c2 order by t1.k; select * from t1, t2 where t1.c2 = t2.c2 order by t1.k; PASS 2)double join souble explain select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c3 = t2.c3 ; select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c3 = t2.c3 order by t1.k; select * from t1, t2 where t1.c3 = t2.c3 order by t1.k; PASS 3)int JOIN varchar explain select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c1 = t2.c2 ; select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c1 = t2.c2 order by t1.k; select * from t1, t2 where t1.c1 = t2.c2 order by t1.k; 4) varchar join int explain select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c2 = t2.c1 ; select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c2 = t2.c1 order by t1.k; select * from t1, t2 where t1.c2 = t2.c1 order by t1.k; 5) int join double explain select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c1 = t2.c3 ; select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c1 = t2.c3 order by t1.k; select * from t1, t2 where t1.c1 = t2.c3 order by t1.k; 6) double join int explain select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c3 = t2.c1 ; select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c3 = t2.c1 order by t1.k; select * from t1, t2 where t1.c3 = t2.c1 order by t1.k; 7) double join varchar explain select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c3 = t2.c2 ; select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c3 = t2.c2 order by t1.k; select * from t1, t2 where t1.c3 = t2.c2 order by t1.k;		

	8) varchar join double explain select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c2 = t2.c3; select /*+JOIN(hash_join)*/ * from t1, t2 where t1.c2 = t2.c3 order by t1.k; select * from t1, t2 where t1.c2 = t2.c3 order by t1.k;		
测试结果	不支持不同数据类型连接		
编号	8	配置	197, 单集群, RS+UPS+CS+MS
测试目的	测试基本 JOIN 功能（连接类型）		
测试输入	explain select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k; explain select /*+JOIN(hash_join)*/ * from t1 inner join t2 on t1.k=t2.k; explain select /*+JOIN(hash_join)*/ * from t1 left join t2 on t1.k=t2.k; explain select /*+JOIN(hash_join)*/ * from t1 right join t2 on t1.k=t2.k; explain select /*+JOIN(hash_join)*/ * from t1 full join t2 on t1.k=t2.k; select /*+JOIN(hash_join)*/ * from t1 join t2 on t1.k=t2.k; select /*+JOIN(hash_join)*/ * from t1 inner join t2 on t1.k=t2.k; select * from t1 join t2 on t1.k=t2.k; select /*+JOIN(hash_join)*/ * from t1 left join t2 on t1.k=t2.k; select * from t1 left join t2 on t1.k=t2.k; select /*+JOIN(hash_join)*/ * from t1 right join t2 on t1.k=t2.k; select * from t1 right join t2 on t1.k=t2.k; select /*+JOIN(hash_join)*/ * from t1 full join t2 on t1.k=t2.k; select * from t1 full join t2 on t1.k=t2.k; explain select /*+JOIN(hash_join, hash_join, hash_join, hash_join, hash_join)*/ * from t1 inner join t2 on t1.k=t2.k left join t3 on t2.k=t3.k right join t4 on t3.k=t4.k full join t5 on t4.k=t5.k join t6 on t5.k=t6.k where t5.c1 between 1 and 5; select /*+JOIN(hash_join, hash_join, hash_join, hash_join, hash_join)*/ * from t1 inner join t2 on t1.k=t2.k left join t3 on t2.k=t3.k right join t4 on t3.k=t4.k full join t5 on t4.k=t5.k join t6 on t5.k=t6.k where t5.c1 between 1 and 5; select * from t1 inner join t2 on t1.k=t2.k left join t3 on t2.k=t3.k right join t4 on t3.k=t4.k full join t5 on t4.k=t5.k join t6 on t5.k=t6.k where t5.c1 between 1 and 5;		
测试结果	PASS		
编号	9	配置	197, 单集群, RS+UPS+CS+MS

测试目的	测试 JOIN 功能（表别名）		
测试输入	explain select /*+JOIN(hash_join)*/ * from t1 tt1 join t2 tt2 on tt1.k = tt2.c1; select /*+JOIN(hash_join)*/ * from t1 tt1 join t2 tt2 on tt1.k = tt2.c1; select /*+JOIN(hash_join)*/ * from t1 tt1 , t2 tt2 where tt1.k = tt2.c1; select * from t1 tt1 join t2 tt2 on tt1.k = tt2.c1;		
测试结果	PASS		
编号	10	配置	197, 单集群, RS+UPS+CS+MS
测试目的	测试基本 JOIN 功能（单表）		
测试输入	Explain select /*+JOIN(hash_join)*/ * from t1 where t1.k=t1.c1; select /*+JOIN(hash_join)*/ * from t1 where t1.k=t1.c1; select * from t1 where t1.k=t1.c1; 没有走 hash_join select /*+JOIN(hash_join)*/ * from t1 where t1.k=t1.c2; select * from t1 where t1.k=t1.c2; select /*+JOIN(hash_join)*/ * from t1 where t1.k=t1.c3; select * from t1 where t1.k=t1.c3; Explain select /*+JOIN(hash_join)*/ * from t1; 没有走 hash_join		
测试结果	正常执行不走 join		
编号	11	配置	197, 单集群, RS+UPS+CS+MS
测试目的	测试基本 JOIN 功能（二级索引）		
测试输入	T3t4 表有索引 explain select /*+JOIN(hash_join)*/ * from t1, t3 where t1.k=t3.c2 and t3.c1<100; select /*+JOIN(hash_join)*/ * from t2, t3 where t2.c1 = t3.c1 and t3.c1<100 order by t2.k; select * from t2, t3 where t2.c1 = t3.c1 and t3.c1<100 order by t2.k; explain select /*+JOIN(hash_join)*/ * from t4, t3 where t4.c1 = t3.c1 and t3.c1<100; select /*+JOIN(hash_join)*/ * from t4, t3 where t4.c1 = t3.c1 and t3.c1<100 order by t3.k; select * from t4, t3 where t4.c1 = t3.c1 and t3.c1<100 order by t3.k;		
测试结果	PASS		
编号	12	配置	197, 单集群, RS+UPS+CS+MS
测试目的	测试每日合并期间 JOIN 功能		
测试输入	每日合并 explain select /*+JOIN(hash_join)*/ * from t1, t3 where t1.k=t3.c2 and		

	t3.c1<100; select /*+JOIN(hash_join)*/ * from t2, t3 where t2.c1 = t3.c1 and t3.c1<100 order by t2.k; select * from t2, t3 where t2.c1 = t3.c1 and t3.c1<100 order by t2.k;		
测试结果	PASS		
编号	13	配置	197, 单集群, RS+UPS+CS+MS
测试目的	测试基本 JOIN 功能（子查询）		
测试输入	<p> explain select /*+JOIN(hash_join)*/ * from (select * from t1 where t1.c3 <= 0.8) tt1 join t2 on tt1.k=t2.k where t2.c1 between 1 and 7; explain select /*+JOIN(hash_join)*/ * from (select * from t1 where t1.c3 <= 0.8) tt1 join (select * from t2 where t2.c1 between 1 and 7) tt2 on tt1.k=tt2.k; select * from (select * from t1 where t1.c3 >= 0.8) tt1 join t2 on tt1.k=t2.k where t2.c1 between 1 and 7; select * from (select * from t1 where t1.c3 >= 0.8) tt1 join (select * from t2 where t2.c1 between 1 and 7) tt2 on tt1.k=tt2.k; select /*+JOIN(hash_join)*/ * from (select * from t1 where t1.c3 >= 0.8) tt1 join t2 on tt1.k=t2.k where t2.c1 between 1 and 7; select /*+JOIN(hash_join)*/ * from (select * from t1 where t1.c3 >= 0.8) tt1 join (select * from t2 where t2.c1 between 1 and 7) tt2 on tt1.k=tt2.k; </p> <p> explain select /*+JOIN(MERGE_JOIN, hash_join, MERGE_JOIN, hash_join, hash_join)*/ * from (select t3.k from (select t1.k from t1, t2 where t1.k = t2.k and t1.c1 > 4) tmp1 join t3 on tmp1.k=t3.k) tmp2 left join t4 on tmp2.k=t4.k, t5, t6 where t4.c1 < 9 and t4.k=t5.k and t5.c2>=5 and t5.c2=t6.c1; select /*+JOIN(MERGE_JOIN, hash_join, MERGE_JOIN, hash_join, hash_join)*/ * from (select t3.k from (select t1.k from t1, t2 where t1.k = t2.k and t1.c1 > 4) tmp1 join t3 on tmp1.k=t3.k) tmp2 left join t4 on tmp2.k=t4.k, t5, t6 where t4.c1 < 9 and t4.k=t5.k and t5.c2>=5 and t5.c2=t6.c1; select * from (select t3.k from (select t1.k from t1, t2 where t1.k = t2.k and t1.c1 > 4) tmp1 join t3 on tmp1.k=t3.k) tmp2 left join t4 on tmp2.k=t4.k, t5, t6 where t4.c1 < 9 and t4.k=t5.k and t5.c2>=5 and t5.c2=t6.c1; </p>		
测试结果	PASS		
编号	14	配置	197, 单集群, RS+UPS+CS+MS
测试目的	测试 Hash Join 并行执行		
测试输入	多线程对相同表相同属性进行 Hash Join explain select /*+JOIN(hash_join)*/ * from t1, t3 where t1.k=t3.c2 and t3.c1<100;		

	<pre>select /*+JOIN(hash_join)*/ * from t2, t3 where t2.c1 = t3.c1 and t3.c1<100 order by t2.k; select * from t2, t3 where t2.c1 = t3.c1 and t3.c1<100 order by t2.k;</pre>
测试结果	PASS

性能测试

编号	1	配置	三集群+6ms
测试目的	测试 join 的深度对性能的影响		
测试输入	1、2 张 500w 的表 inner join、3 张 500w 的表 inner join、4 张 500w 的表 inner join、5 张 500w 的表 inner join、6 张 500w 的表 inner join。 2、2 张 1000w 的表 inner join、3 张 1000w 的表 inner join、4 张 1000w 的表 inner join、5 张 1000w 的表 inner join、6 张 1000w 的表 inner join。		
测试结果	随着 join 深度增加，Merge Join 和 Bloomfilter Join 所费时间大幅度上升，而 Hash Join 所耗时间缓慢上升，性能最好。		

编号	2	配置	三集群+6ms
测试目的	测试 Hash Join 在选择率为 10% 的情况下，非重复值个数对性能的影响（连接属性为 int 类型）		
测试输入	左右表都为 2000 万条数据，左表的非重复值个数为（500w,800w,1000w,1600w,2000w）。		
测试结果	Join 表数目为 2000w 时，随着左表非重复数的增加，Hash Join 所耗时间远低于 merge join 和 bloom filter join，hash join 性能远好于 Bloom filter Join 和 Merge Join。		

编号	3	配置	三集群+6ms
测试目的	测试 Hash Join 在非重复值个数为 500 万下，选择率对性能的影响（连接属性为 int 类型）。		
测试输入	左表 1000 万条数据（非重复数 500 万，选择率 0.1%，1%，10%，30%，60%，90%）		
测试结果	在非重复值个数为 500w 时，Join 左右表数目为 1000 万时，Hash Join 所耗时间低于 merge join 和 bloom filter join，hash join 性能远好于 Bloom filter Join 和 Merge Join。		

编号	4	配置	三集群+6ms
测试目的	测试 Hash Join 在选择率为 10% 的情况下，非重复值个数对性能的影响（连接属性为 varchar 类型）		
测试输入	左右表 2000 万条数据（非重复数 500w,800w,1000w,1600w,2000w，连接属性为 varchar 类型）		

测试结果	在将左表的非重复值个数增加到(500w,800w,1000w,1600w,2000w)时, Join 表数目为 2000w 时, Hash Join 性能远好于 Bloom filter Join 和 Merge Join。当连接属性为 varchar 类型时, 相较于 Bloom filter Join 和 Merge Join, Hash Join 性能更优。
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编号	5	配置	三集群+6ms
测试目的	测试 Hash Join 在非重复值个数为 500 万下, 选择率对性能的影响(连接属性为 varchar 类型)		
测试输入	左右表 1000 万条数据(非重复数 500 万, 选择率 0.1%, 1%, 10%, 30%, 60%, 90%)		
测试结果	Hash Join 性能远好于 Bloom filter Join 和 Merge Join。连接属性为 varchar 类型时,相较于 Bloom filter Join 和 Merge Join, Hash Join 性能更优。		