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# Monitoring Scale-Out with the MySQL Enterprise Monitor

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MySQL-Sun, Enterprise Tools Team

Wednesday, April 16, 2008
5:15 pm – 6:00 pm
Ballroom E

# Agenda

- MySQL Enterprise Monitor
- ReplMxj
- Detecting Replication Topologies
- Replication Monitoring and Rules
- Mysqlslap – Stressing a System
- Q&A
- Related Sessions

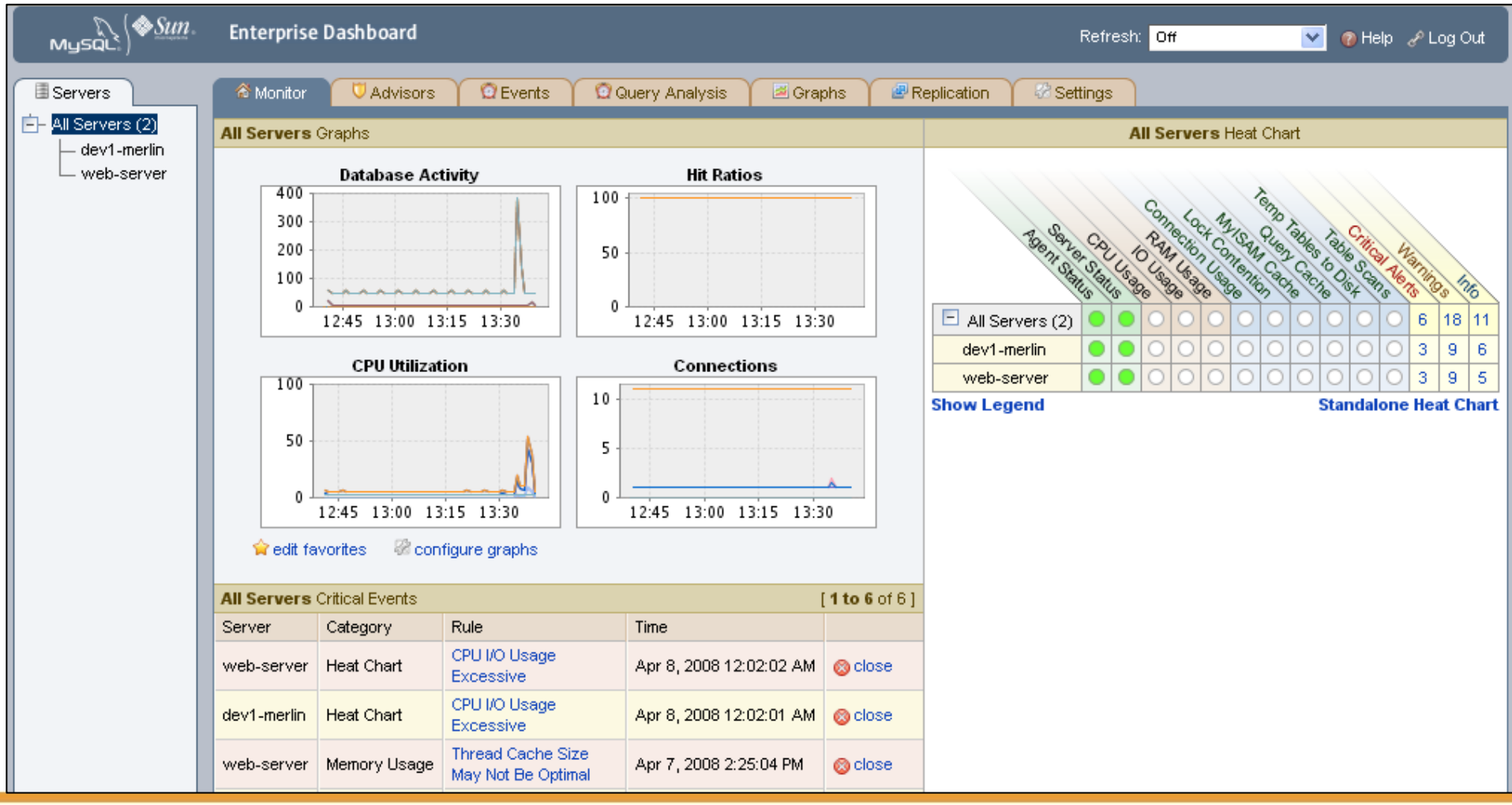
# MySQL Enterprise Monitor

- Virtual DBA Assistant
- Consolidated view into the health of all your MySQL servers
- Monitor & graph over 600 MySQL and OS variables
- View replication topologies through auto detection and grouping
- View real-time master/slave performance
- Run over 110 Advisor Rules
- Notification of issues using threshold driven alerts

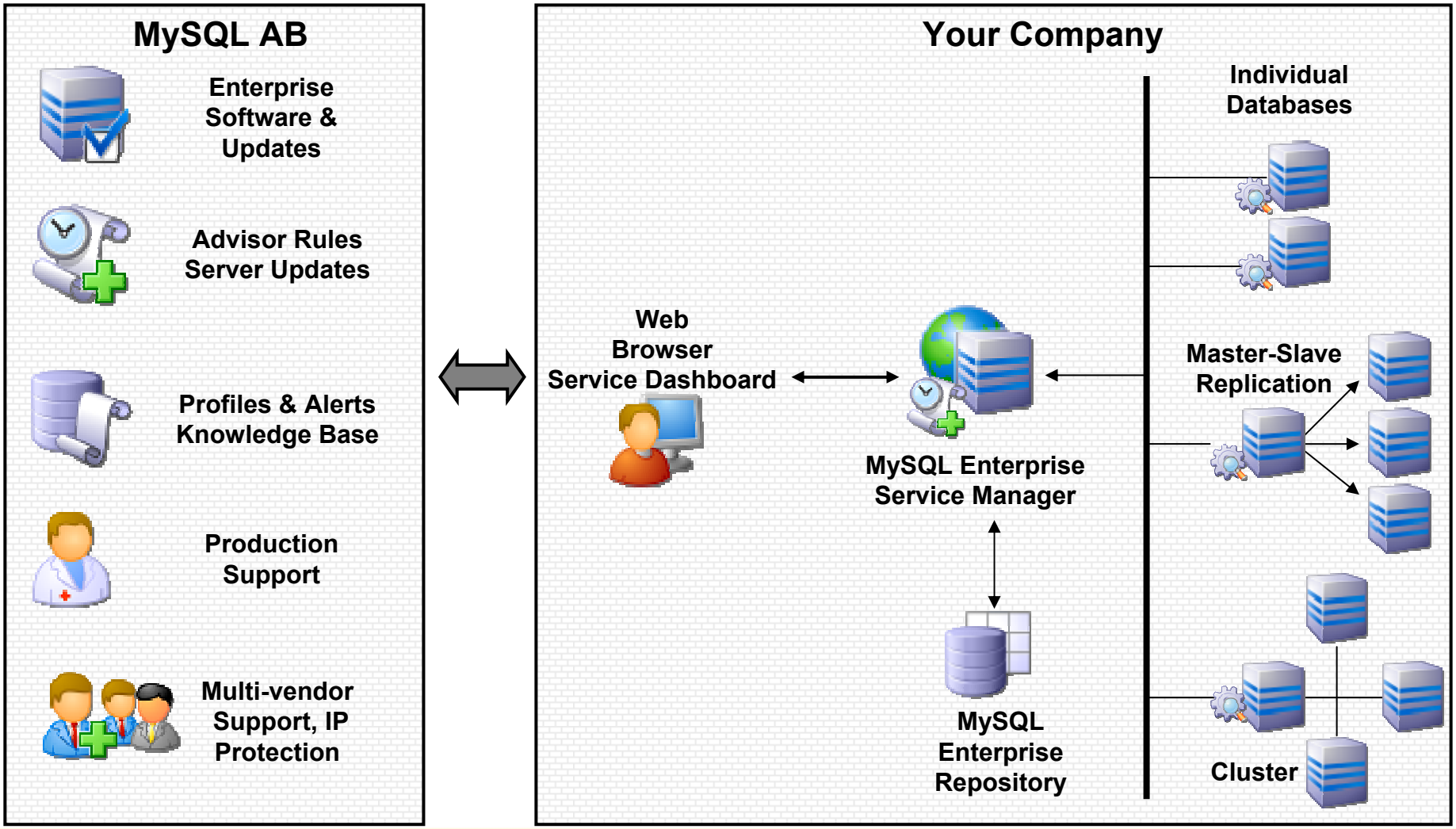
# MEM -- Advisors

- Administration - recommends database administration best practices
- Memory Usage - monitors dynamic memory related server metrics (cache usage, hit ratios, etc.); recommends config changes to improve performance
- Performance - identifies parameters to tune to improve database performance
- Replication - finds issues and recommends solutions to replication setup and performance problems
- Schema - assists in finding and addressing DB design issues
- Security - helps identify and fix security vulnerabilities in a MySQL Server
- Upgrade - Monitors and advises on specific bugs that can potentially impact versions of MySQL deployed within an environment
- Custom - allows you to add your own custom best practice rules

# MEM – Monitoring



# MEM – Architecture



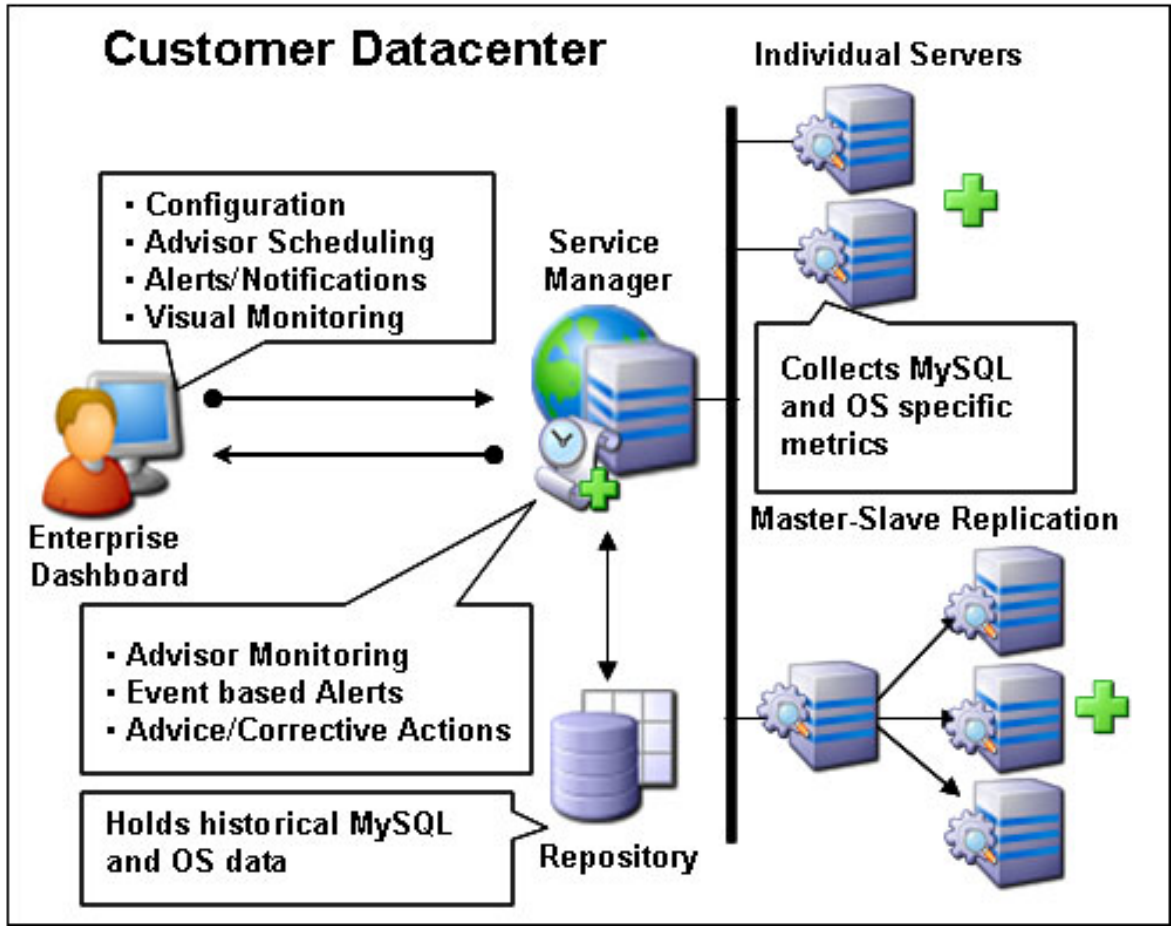
# MEM – Architecture

**Service Agent** written in C and supports all MySQL Enterprise platforms

**Service Manager** written in Java servlets exposed as web services. Supports Linux, Solaris, Mac OSX and Microsoft Windows

**Enterprise Dashboard** Web-based, written in JSP

**Repository** holds historical performance data for analysis

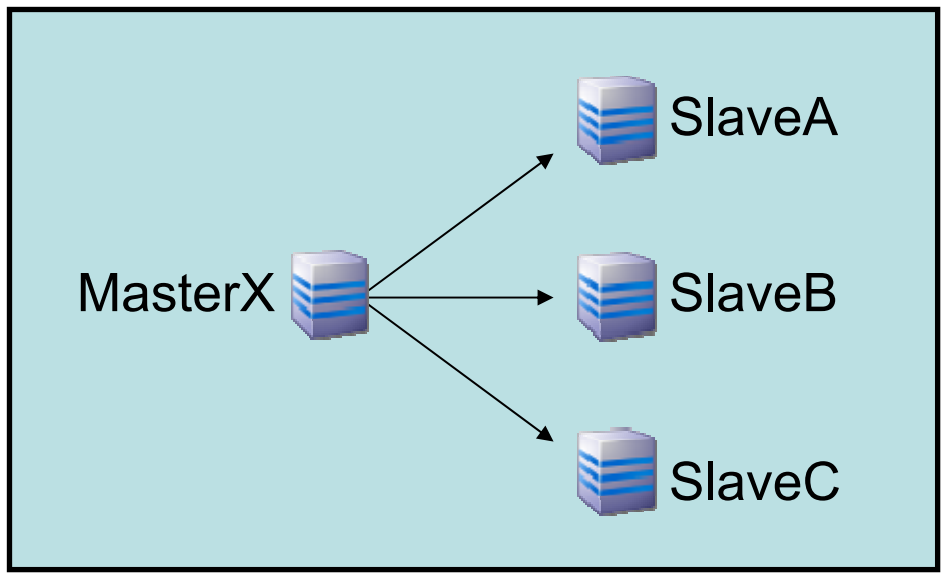


# ReplMxj

- Written by Darren Oldag
- Deploys a MySQL replication topology on a single host
- Topology defined in a DOT file
  - http://en.wikipedia.org/wiki/DOT_language
- Also creates service agent INI files for each of the nodes, and a shell script to start agents with each of those INI files
- Connector/MXJ
  - Linux (i386), Mac (i386 & PPC), Solaris (SPARC & x86), Windows (x86)
- Open Source? Interested?

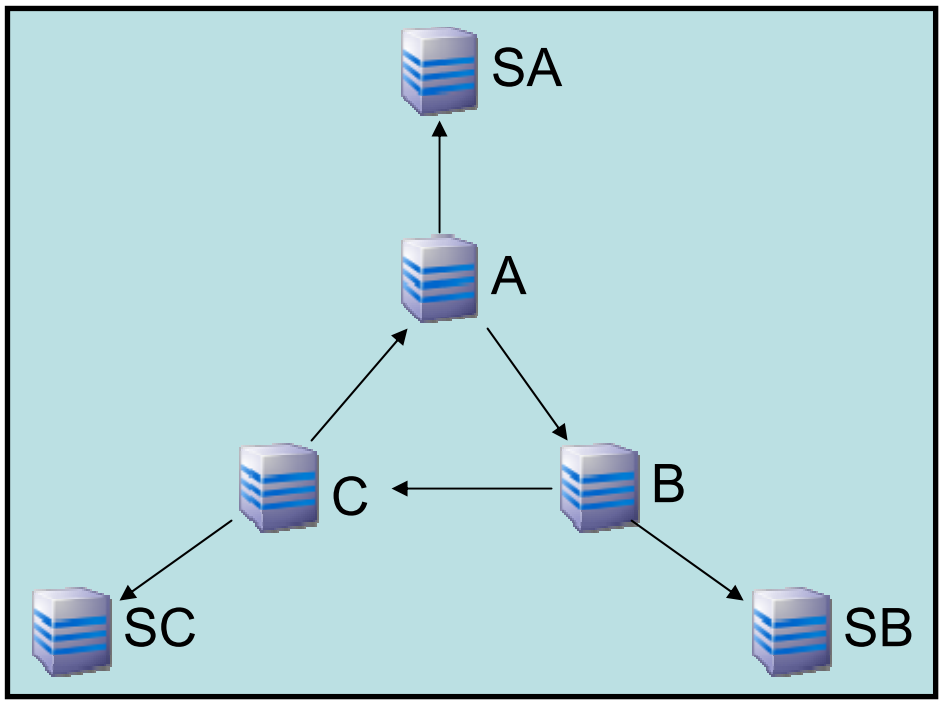
# ReplMxj – Master and Slaves

```
digraph Master3Slaves
{
   "manager.url"="http://agent:mysql@localhost:8080/merlin/heartbeat"

    baseport=10100;
    MasterX;
    MasterX->SlaveA;
    MasterX->SlaveB;
    MasterX->SlaveC;
}
```



# ReplMxj – Ring and Spoke

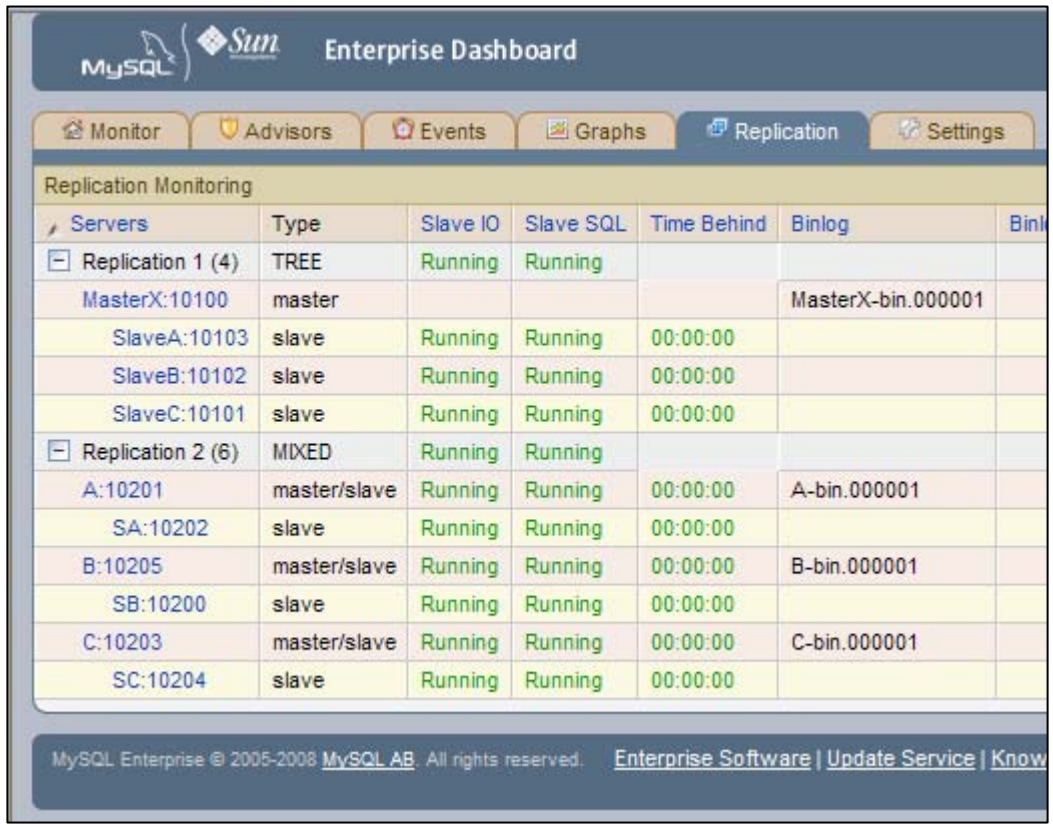
```
digraph RingSpoke
{
    "manager.url"="http://agent:mysql@localhost:8080/merlin/heartbeat"

    baseport=10200;
    B;
    A->B->C->A;
    A->SA;
    B->SB;
    C->SC;
}
```



# ReplMxj – Deploying a Topology

- Deploying the MySQL server instances
  - java -jar replmxj.jar Master3Slaves.dot
    - Creates subdirectories for each server
    - Installs servers in each directory (based on OS)
    - Configures replication and starts servers
- Starting the Enterprise Monitor agents
  - cd Master3Slaves
  - start-agents “C:\Program Files\MySQL\MySQL Network\Agent\mysql-service-agent.exe”

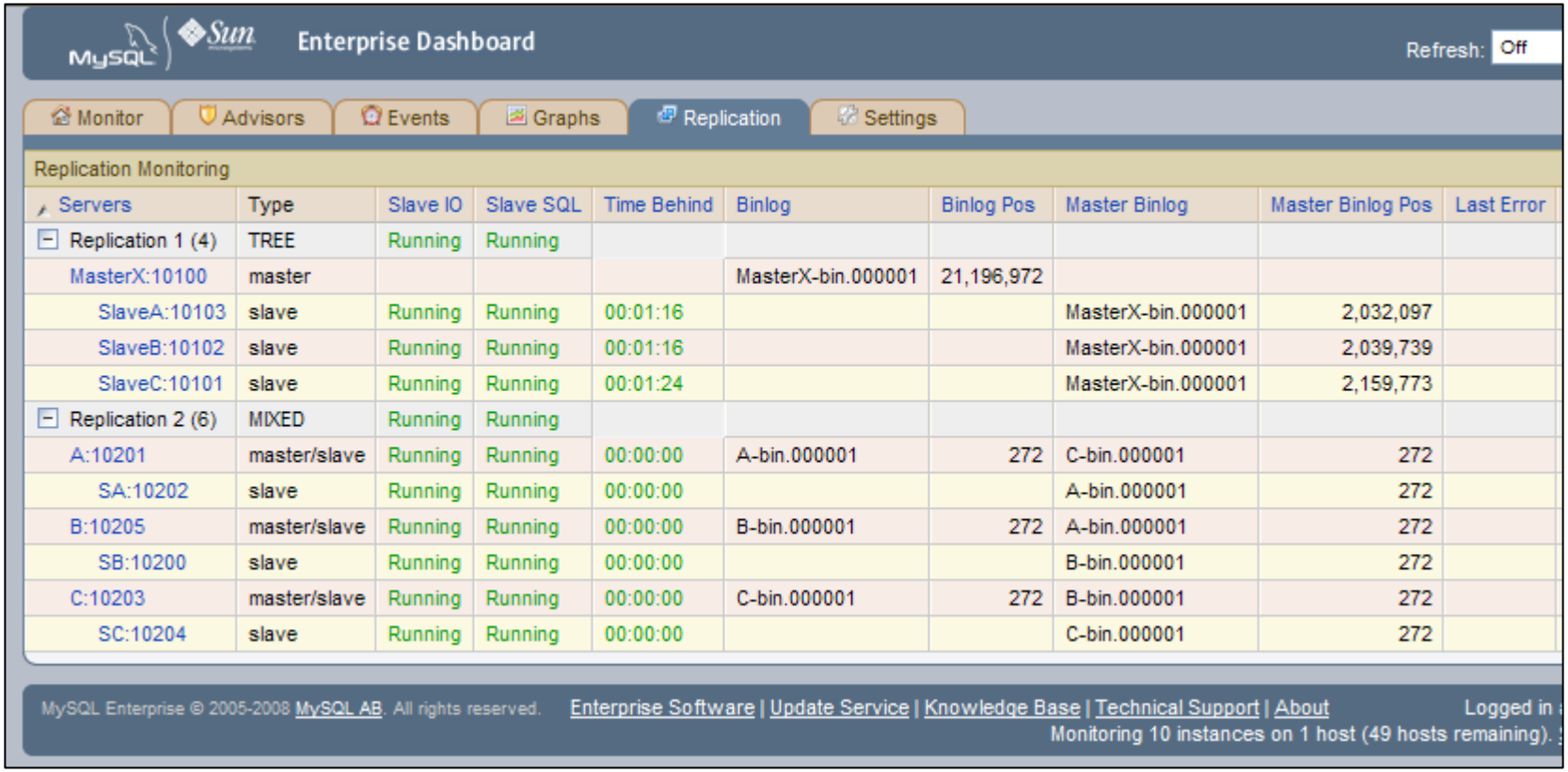
# MEM – Auto-Detection of Topology



# MEM – Auto-Detection Details

- Agent sends “inventory” of data collection items
  - Tries to run SHOW MASTER/SLAVE STATUS
- SM schedules data collections for interfaces & variables
- Agent collects data, resolves host names to IP addresses, and sends data items to SM every 5 minutes
- SM uses data items to determine if server is master and/or slave
- SM uses IP address & port to match slaves to masters & create groups
- Potential Problems:
  - DNS not working
  - Remote agents
  - Localhost

# MEM – Replication Monitoring



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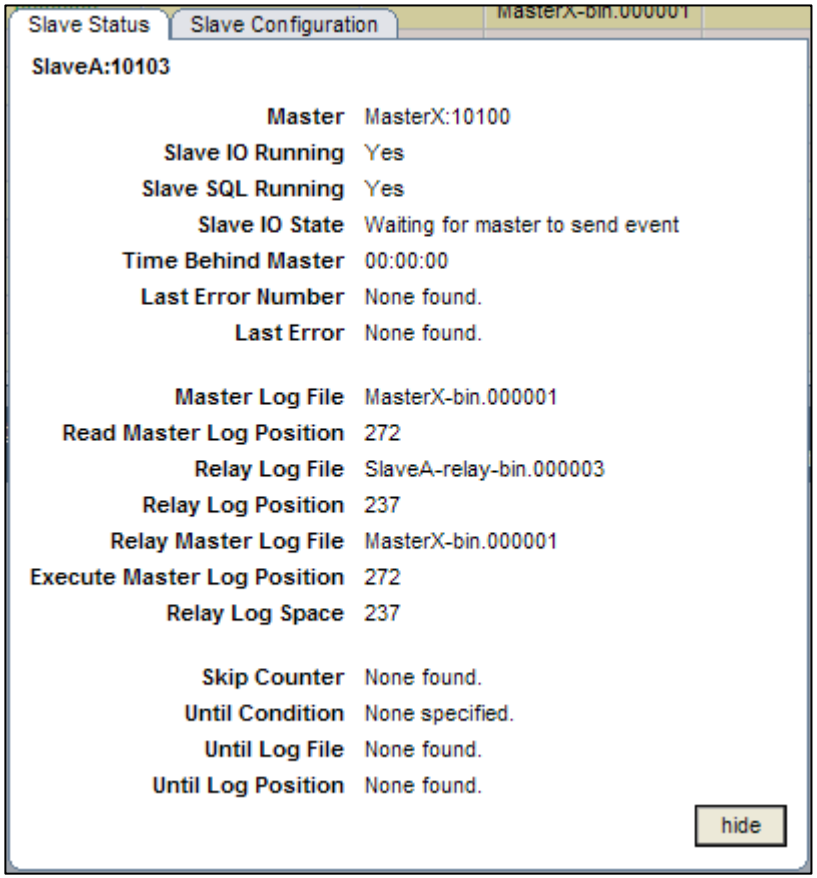
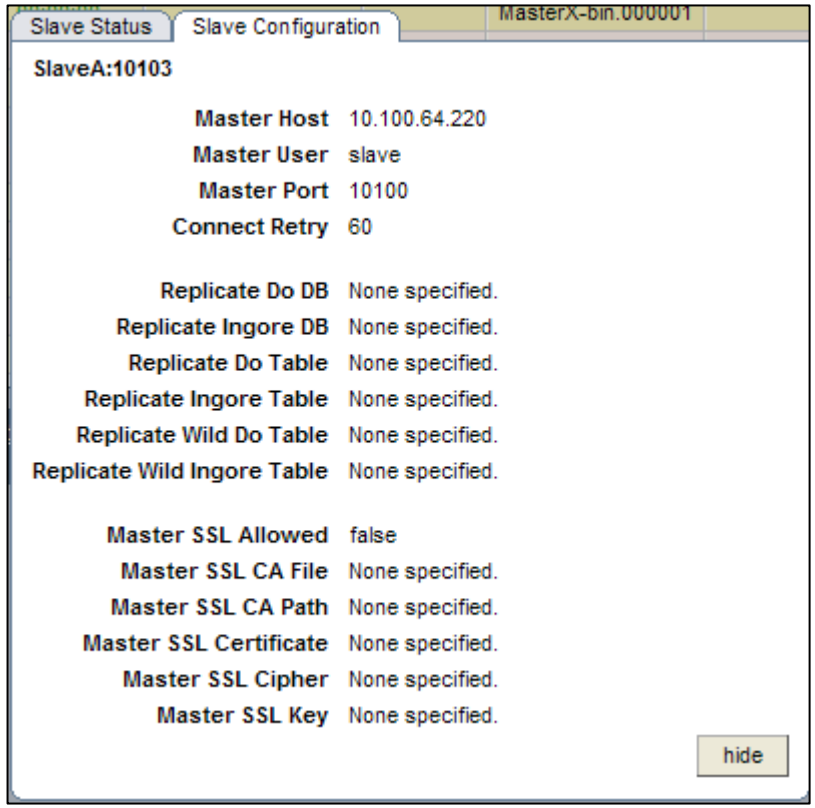
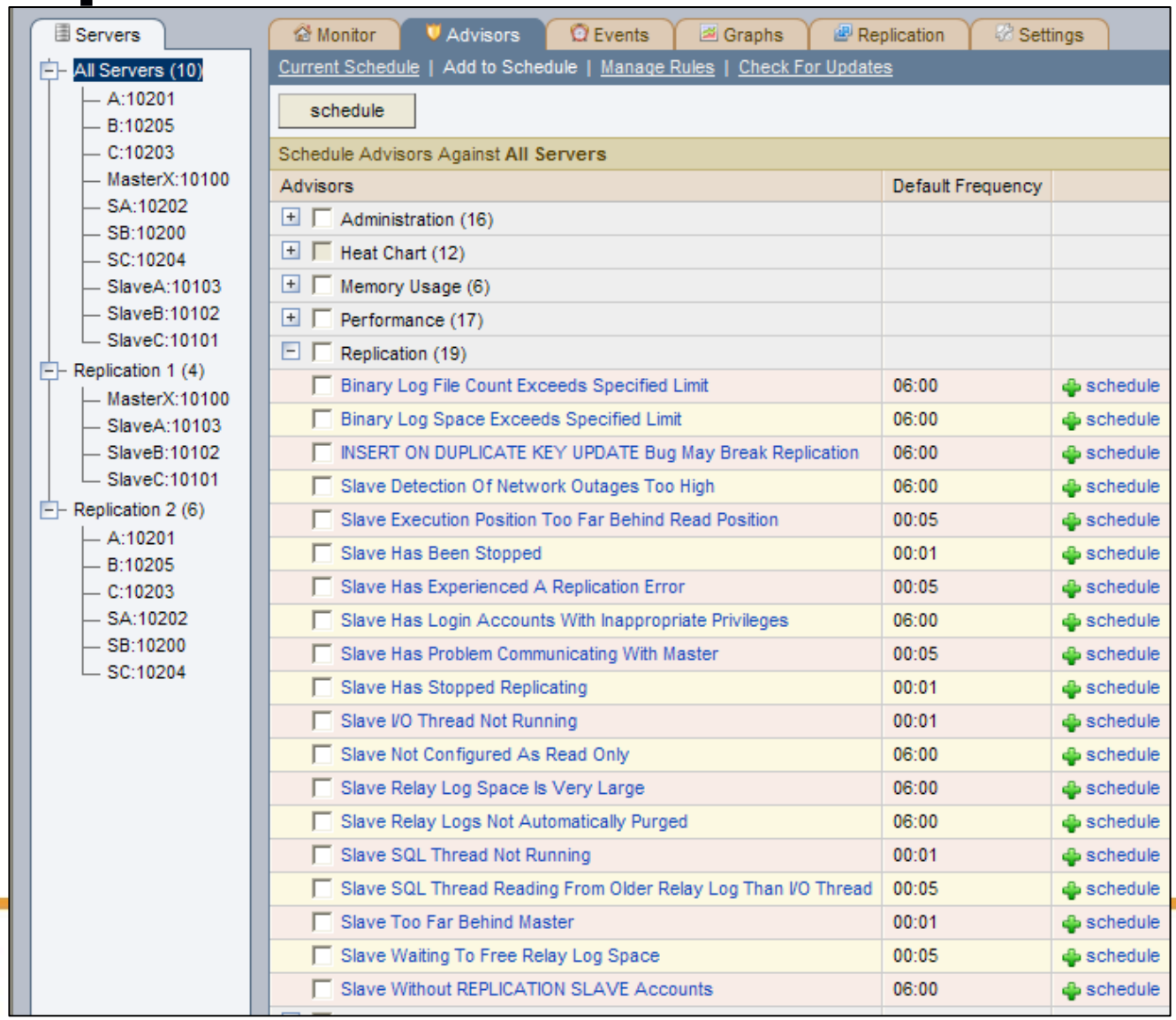
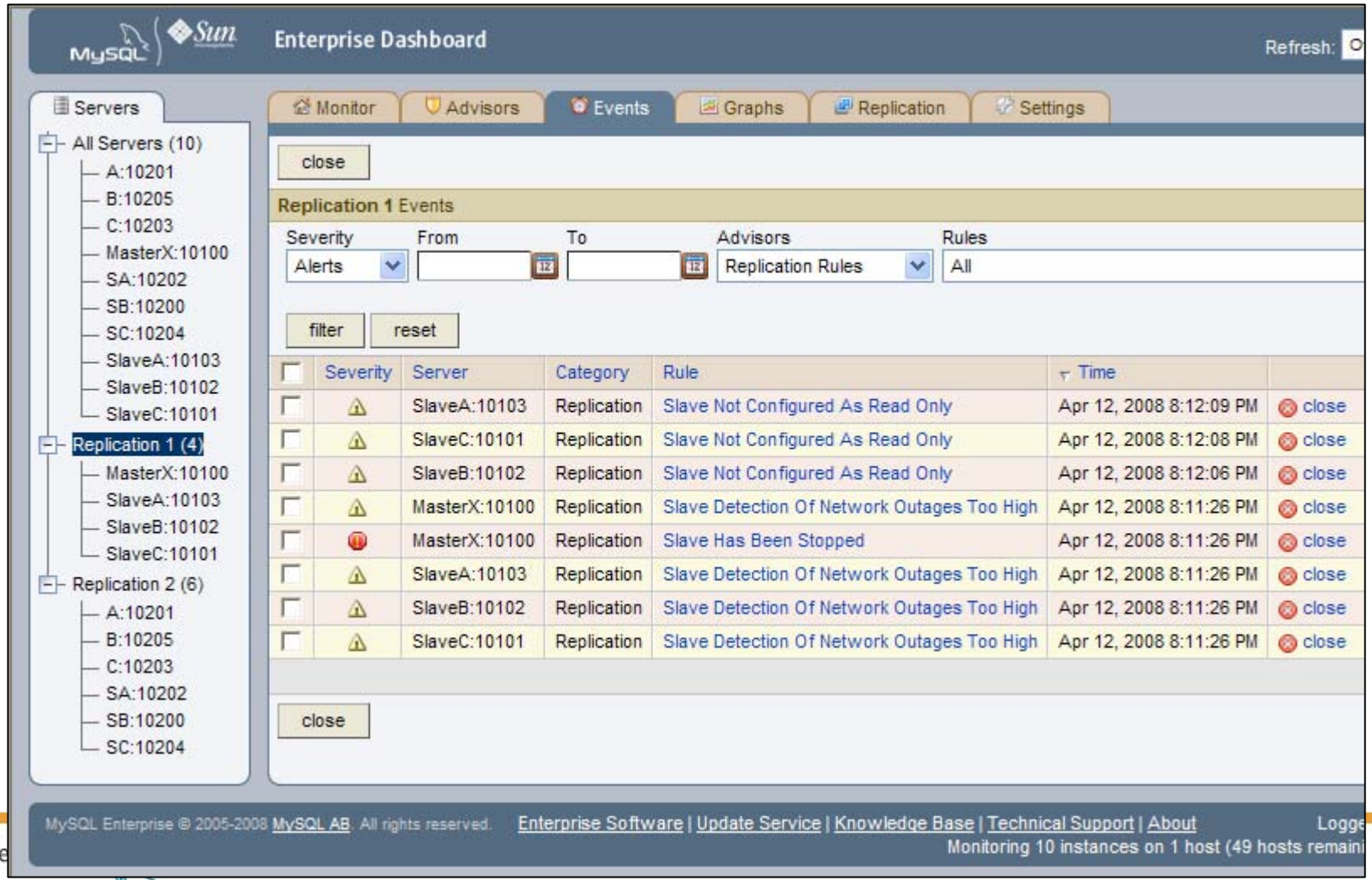


# MEM – Replication Rules



# MEM – Replication Events



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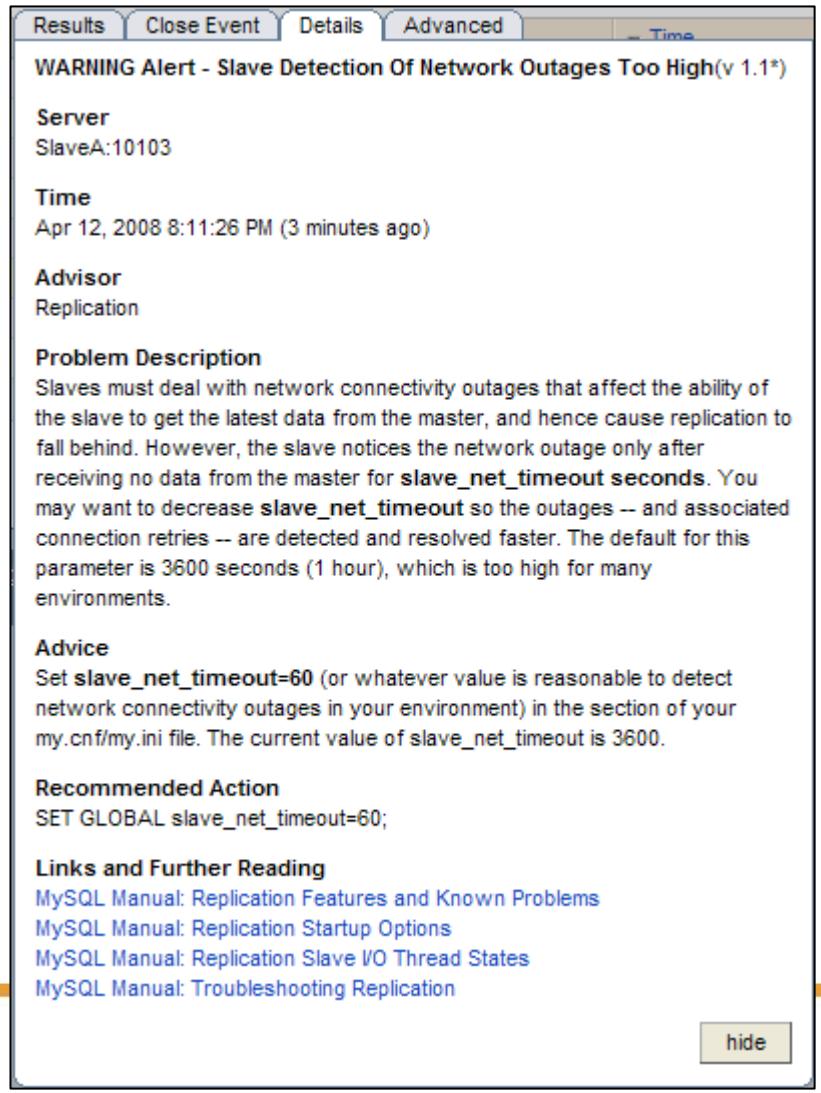


# MysqlSlap -- Overview

- Diagnostic program that emulates client load on a server
- Written by Brian Aker, included with 5.1.4 and later
- Inserts/Queries
  - Auto-generate
  - Command line
  - Read from a file
- More Info
  - http://dev.mysql.com/doc/refman/5.1/en/mysqlslap.html
  - http://krow.livejournal.com/385573.html
  - http://blogs.techrepublic.com.com/howdoi/?p=133

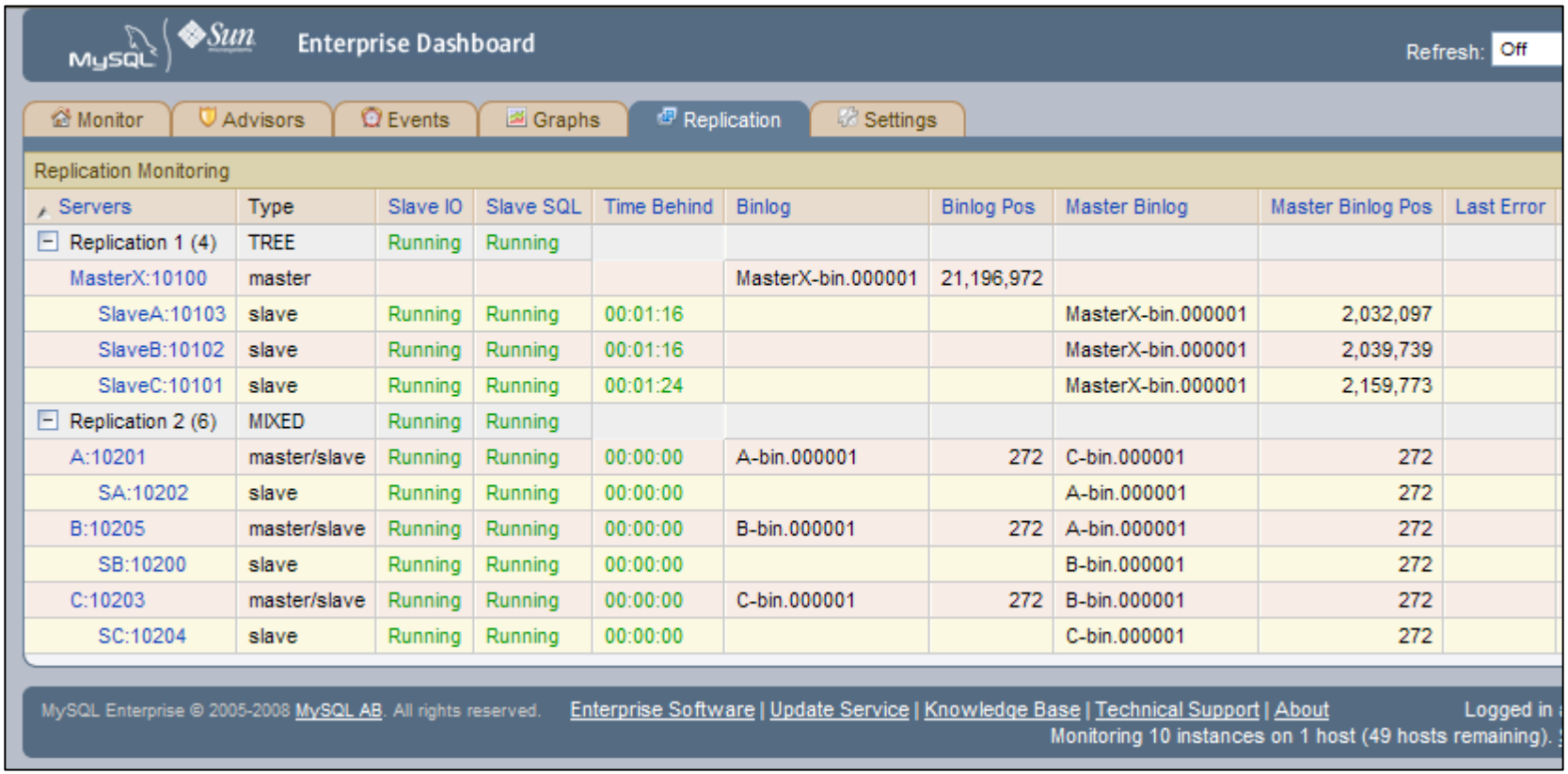
# Mysqlslap – Slapping Our Master

- mysqlslap -uroot -P10100
  - --auto-generate-sql
  - --auto-generate-sql-execute-number=1000
  - --concurrency=5,10,15,20
  - --iterations=10
  - --number-char-cols=5
  - --number-int-cols=5
  - --only-print

# Mysqlslap – Slapping Our Master

```
CREATE SCHEMA `mysqlslap`;

use mysqlslap;

CREATE TABLE `t1` (intcol1 INT(32) ,intcol2 INT(32) ,intcol3 INT(32) ,intcol4 INT(32) ,intcol5 INT(32)
,charcol1 VARCHAR(128),charcol2 VARCHAR(128),charcol3 VARCHAR(128),charcol4
VARCHAR(128),charcol5 VARCHAR(128));

INSERT INTO t1 VALUES
(41,18467,6334,26500,19169,'4IIMk551R1Bv2RcrO2ZsMLwebn6BI9snJvuNr2ZZkLXtSnkMxxJNLpyGbqiom
g24SQlq9Aq6LZ89NOacKmwBSOfQjHyei9hZbJIOWxQt6h5ksW9HZxCmWhcbnFaBsq','AL4mARB7xdnZ35
Tpeho2mQAZ80BibAzOH83vL2qXwEgcLofo41utJIe087n8DojnLWHDaTwbrKTJwy3kSOTp2FPZ3jRaN80II0
wehTepdCiysezAHeBFSGr2uYFoQM','QbtpiOchI2r1zHcsTbYKq3phoL9FjMP2PSmxxsYTuhTw9SC5vEp1Y
P0yZz3JG7ppd6pDbxGQP8Mbuu1wXQNtvlDC8Y5tc1y6M14c2p1FqDQkzCfZkuq59mZa28e75I','B2PHaEO
uECzDqndIHDqNSY5iKt72Jnlj4jYhLjCltlBYM2QkgnKZEqAvtXKwnPAKEvOzPwaeMXQyZXkyOzsgRg6AHA
bcnjIO9Mml7xEl7p8jK2M3wH1v54gMGqmXrr','nZgWk8jKX2T0DyyPnH0IJNgdkx8t71q0oZOP0XOvGCAjPc
w6x6dxrpLw2dYxc5h39p5JscbtikausdTYNRNBvnove32uX1Ff5hq6EPjWyJLDEHEcDcP2oh0DLvF22B');

...

SELECT intcol1,intcol2,intcol3,intcol4,intcol5,charcol1,charcol2,charcol3,charcol4,charcol5 FROM t1;
```

# MEM – Replication Monitoring



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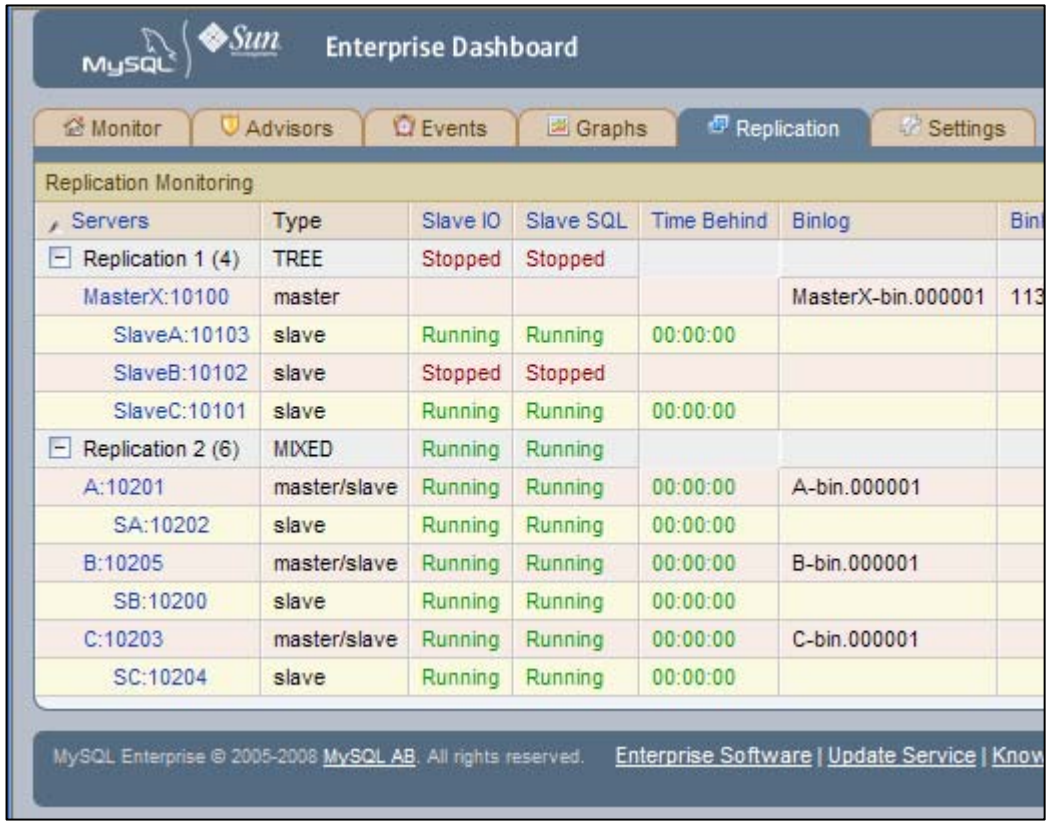

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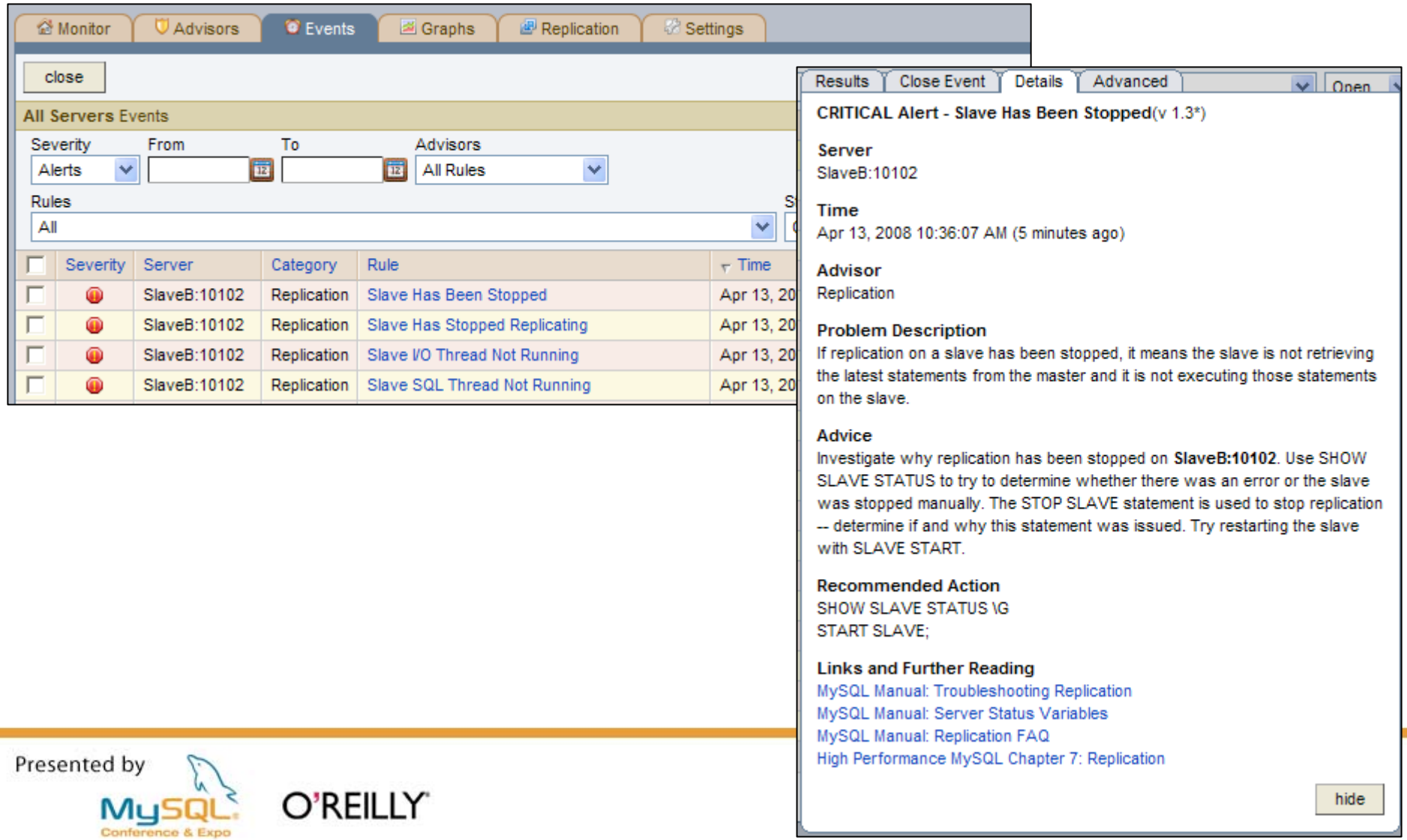

# Q&A

# Related Sessions at the Users Conference

- MySQL Proxy, the Friendly Man in the Middle
  - Jan Kneschke, Jimmy Guerrero (Sun/MySQL)
  - Thursday, 04/17/2008 10:50am - 11:50am Ballroom F
- BoF Sessions
  - MySQL Enterprise Monitor w/Query Analyzer
  - MySQL Load Balancer, Query Analyzer, Connection Manager
- Exhibit Hall
  - Sun and MySQL booths – information, demos, Gurus, fun stuff!