



# A Dashboard for the JCC Logminer Loader



# Digi-Key

- Digi-Key Corporation is an electronics components distributor
- Both Oracle-Rdb and Oracle 11g are critical databases to the business
- Oracle-Rdb houses our on-line production OLTP application
  - Processes between 500-1000 TPS daily (peak business hours)
- Oracle 11g houses miscellaneous applications and the Data Warehouse
- The Data Warehouse is the central source for reporting and BI Analytics for the enterprise, presenting both real-time and point-in-time information for the business
  - Includes data from Oracle Rdb, MS SQL-Server, and Oracle source databases



# Digi-Key Ranking

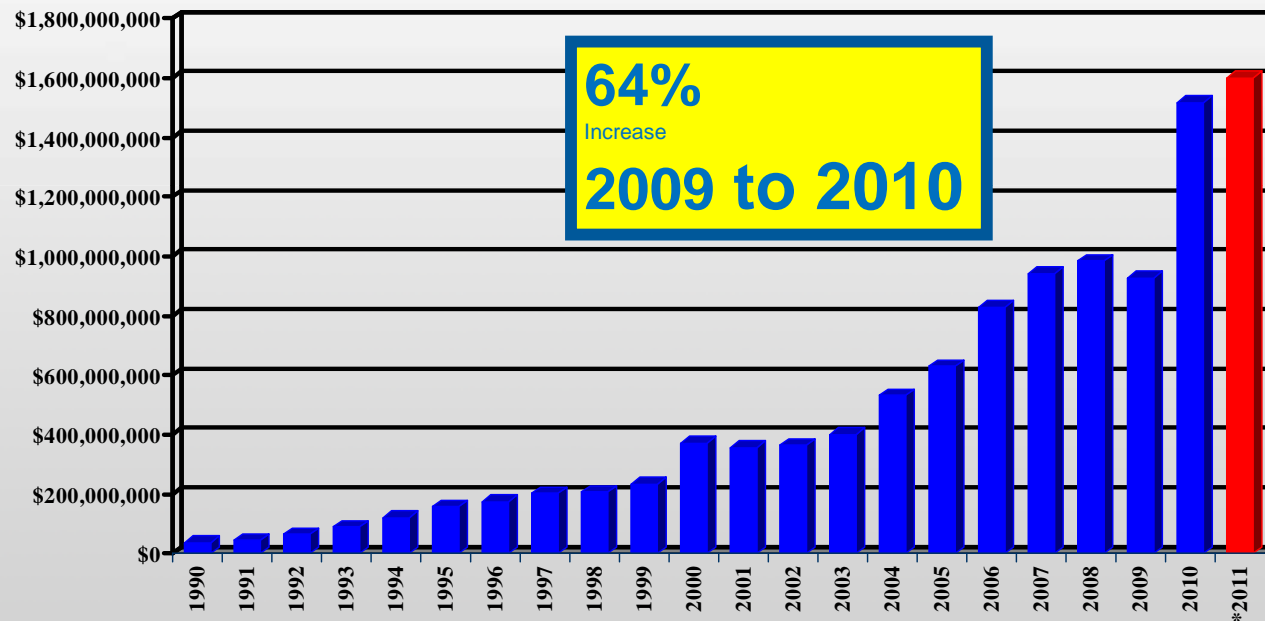
## Top North American Distributors 2010:

<u>Rank</u>	<u>Company Name</u>	<u>North American Revenue (\$ millions)</u>
1	Avnet	10,084.8
2	Arrow Electronics	8,247.7
3	Future Electronics	3506.1
<b>4</b>	<b>Digi-Key Corporation</b>	<b>1026.3</b>
5	TTI, Inc.	812.0
6	Newark	581.8
7	DAC	528.2
8	Allied Electronics	396.0
9	Nu Horizons	381.8
10	Mouser Electronics	338.6



# Sales Growth

- 20 + Years of Phenomenal Sales Growth at Digi-Key





# Disclaimer

- Is not replacement for VMS based on-line monitoring nor TLVIZ analysis
  - Nor any other of the debugging techniques described in Chapter 14



# Agenda

- Requirements
- Technologies Used
- Monitoring and Notifications
- Centralized Reporting



# Requirements

- A “Dashboard” for near real-time monitoring of Data Warehouse update processes (change data capture)
- Two critical attributes: row-rate and trailing
- Historic statistics / trends
- Up / down / trailing / caught-up notifications
- JCC LML just one of the tools used
  - Oracle GoldenGate
    - Oracle’s version of the JCC Logminer Loader
    - Is able to extract transactions from Oracle, MS-SQL Server and other data sources



# Technologies Used

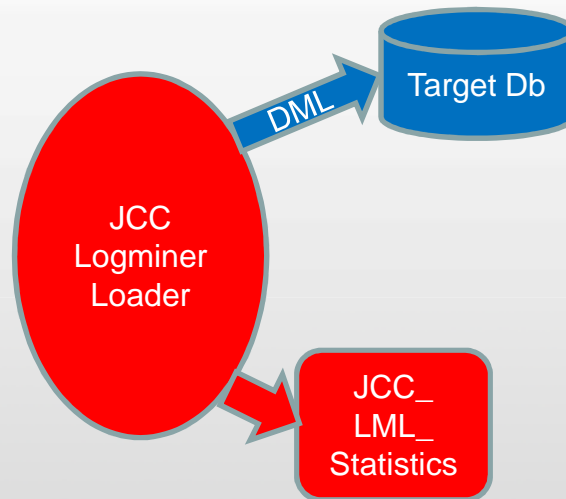
- JCC Logminer Loader
- Database(s) to hold statistics (Rdb, Oracle)
- Reporting mechanism (SSRS)





# The Basics

- JCC's LML writes committed data (DML) to a target database

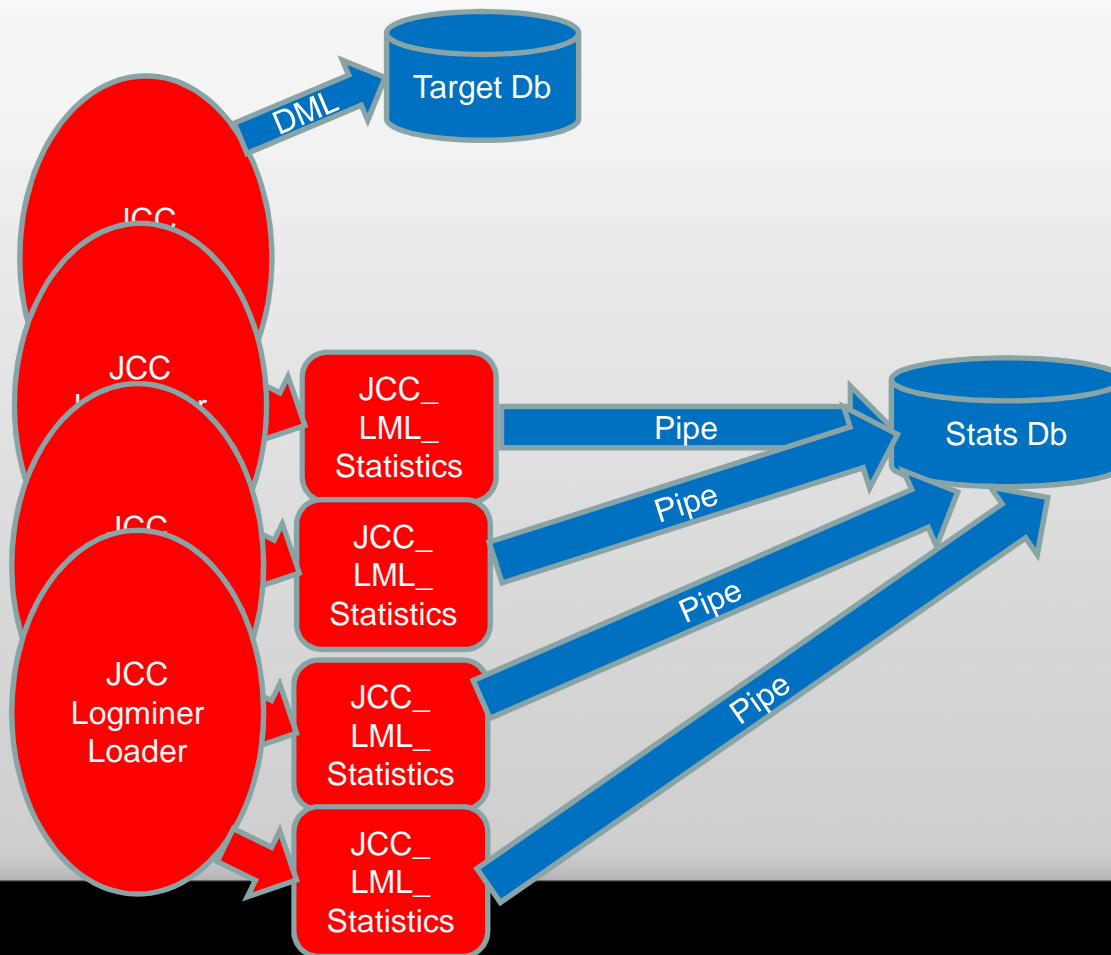


- Statistics process available for monitoring



# Statistics Db

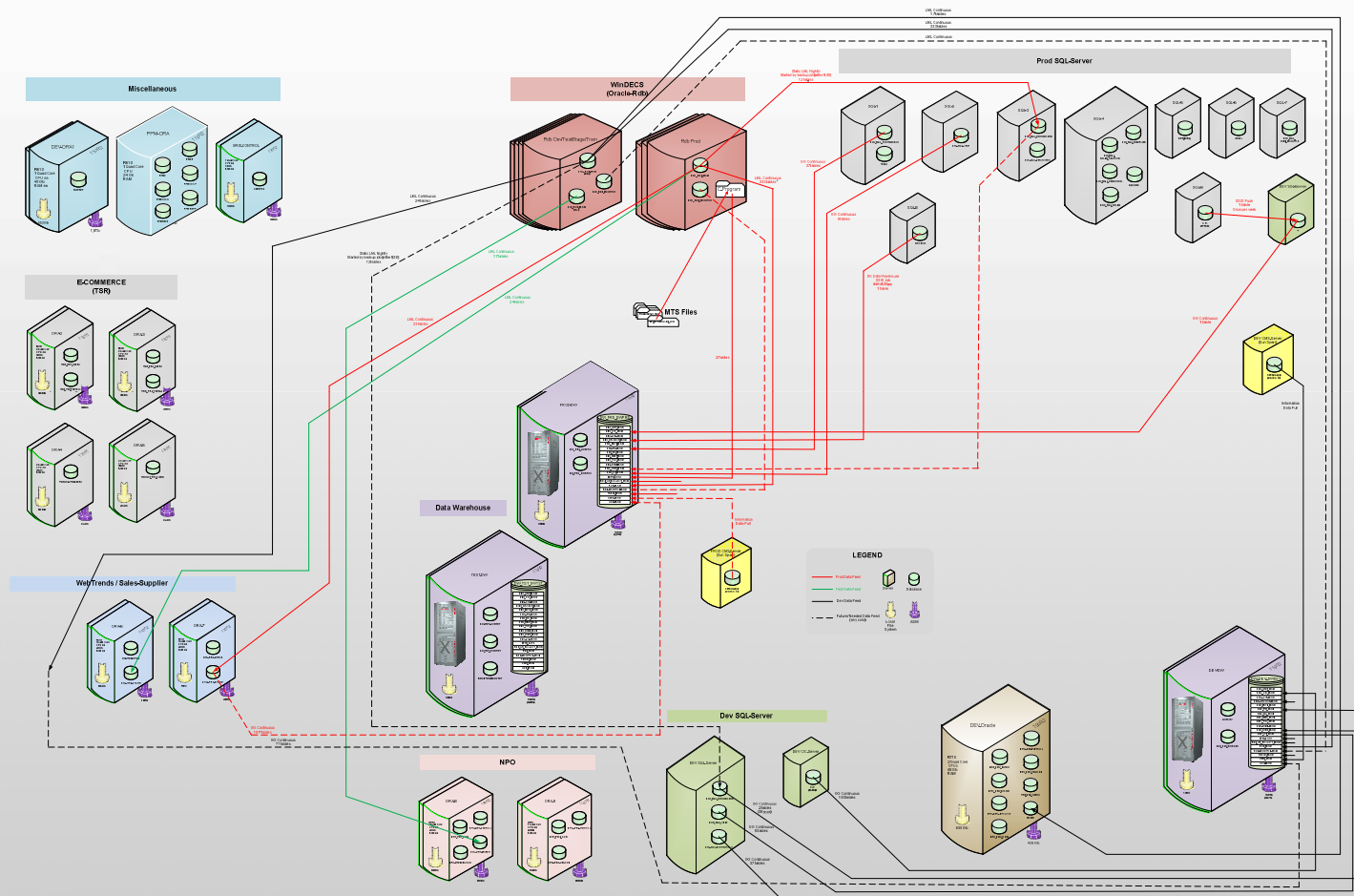
- Next we can pipe the statistics output to a database





# Topology

## Digi-Key Data Movement





# Stats Db

- From JCC's Documentation, the statistics table is defined as:

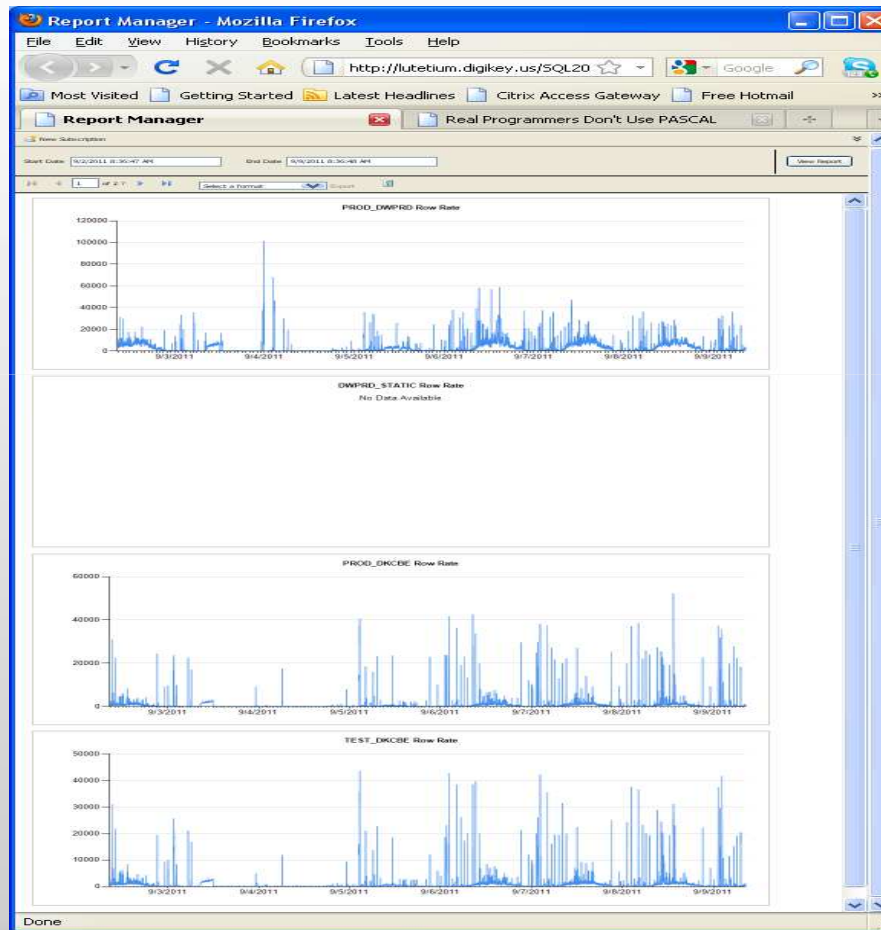
```
create table jcclml$statistics
(Report_Datetime      timestamp(2)
,Loader_name          char(31)
,Commit_Datetime      timestamp(2)
,Row_Rate              integer
,Transaction_Rate      integer
,Source_Txn_Seconds    integer(2)
,Statistics_Interval   integer(2)
,Thruput_Ratio          integer(2)
,Trailing_Seconds       integer(2)
,Input_Timeouts        integer
,Output_Failures        integer
,Loader_Threads        integer
,Total_Latency          integer(2)
,Input_Latency          integer(2)
,Output_latency         integer(2));
```

- Pipe the stats as follows:

```
$ define JCC_LOGMINER_LOADER_STAT_CSV_DATE "|!Y4-!MN0-!D0:!H04:!M0:!S0.!C2|"
$ define JCC_LOGMINER_LOADER_STAT_OPTIONS "noheader,nointeractive"
$ define stats_rrd jcc_tool_source:JCCLML$STATISTICS.RRD
$ define error_file jccstat$errors.txt
$ pipe jcc_lml_statistics <stats-db> <interval> csv | -
  rmu/load/commit=1/row=1/rec=(file=stats_rrd,form=delim,pre="",suff="",null="(none)",except=error_file) -
  /log <stats-db> JCCLML$STATISTICS sys$pipe:
```

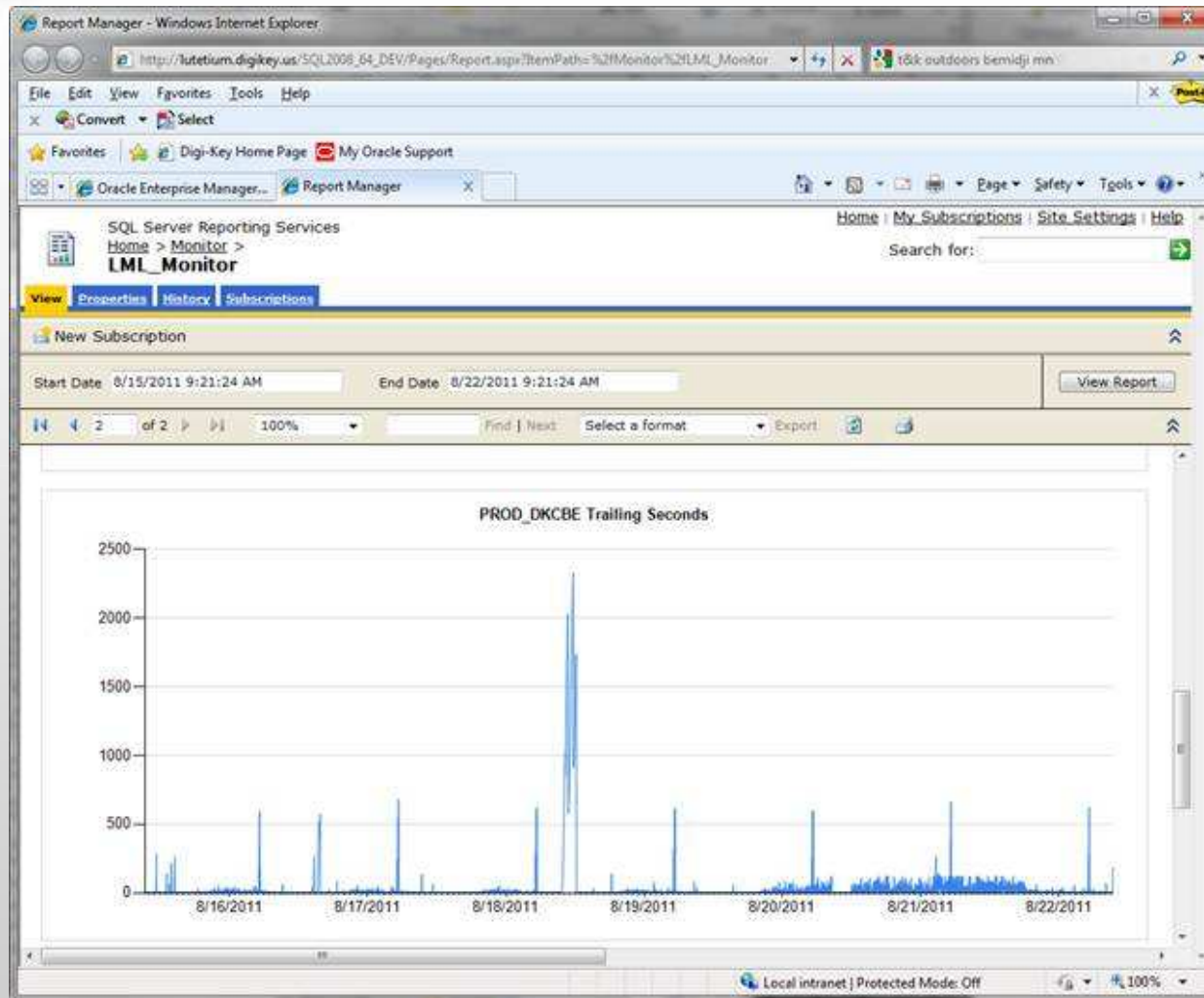


# Row-Rate View





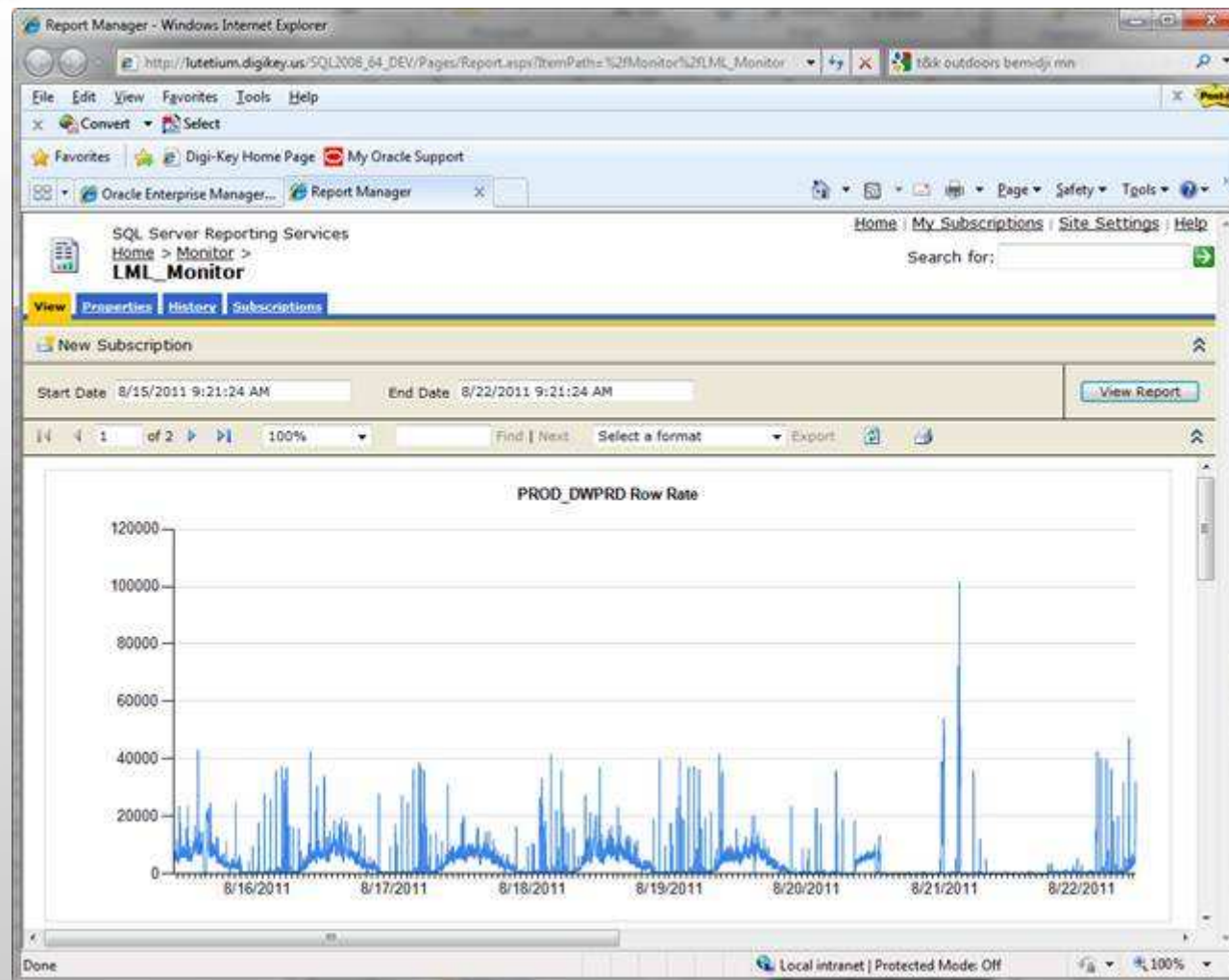
# Trailing Spike







# Daily Row Rate





# Monitoring

- In addition to dashboard, need alerts for various events
- Session Up / Down
- Trailing / Caught-up





# Tardiness Notification

- Digi-Key's tardiness notification program is based on the template CATCH\_OPCOM.C available for download at [http://www.eight-cubed.com/catch\\_opcom.zip](http://www.eight-cubed.com/catch_opcom.zip)
- The same technique provides for “caught-up” notifications as well



# E-Mail Samples

**BAMBOO PROD\_DKCB E LML Session has exceeded tardiness threshold**

From: logminer@prod.dec.dkc.com

%%%%%%%%% OPCOM 13-SEP-2011 05:14:46.00 %%%%%%%%%%

Message from user LOGMINER on BAMBOO

JCCSTAT: JCC Loader 'PROD\_DKCB E' output is trailing realtime by 620.69 seconds

Please check the status of LML Sessions before the AIJ Backup runs.

**BAMBOO PROD\_DKCB E LML Session has caught-up**

From: logminer@prod.dec.dkc.com

%%%%%%%%% OPCOM 13-SEP-2011 05:22:09.00 %%%%%%%%%%

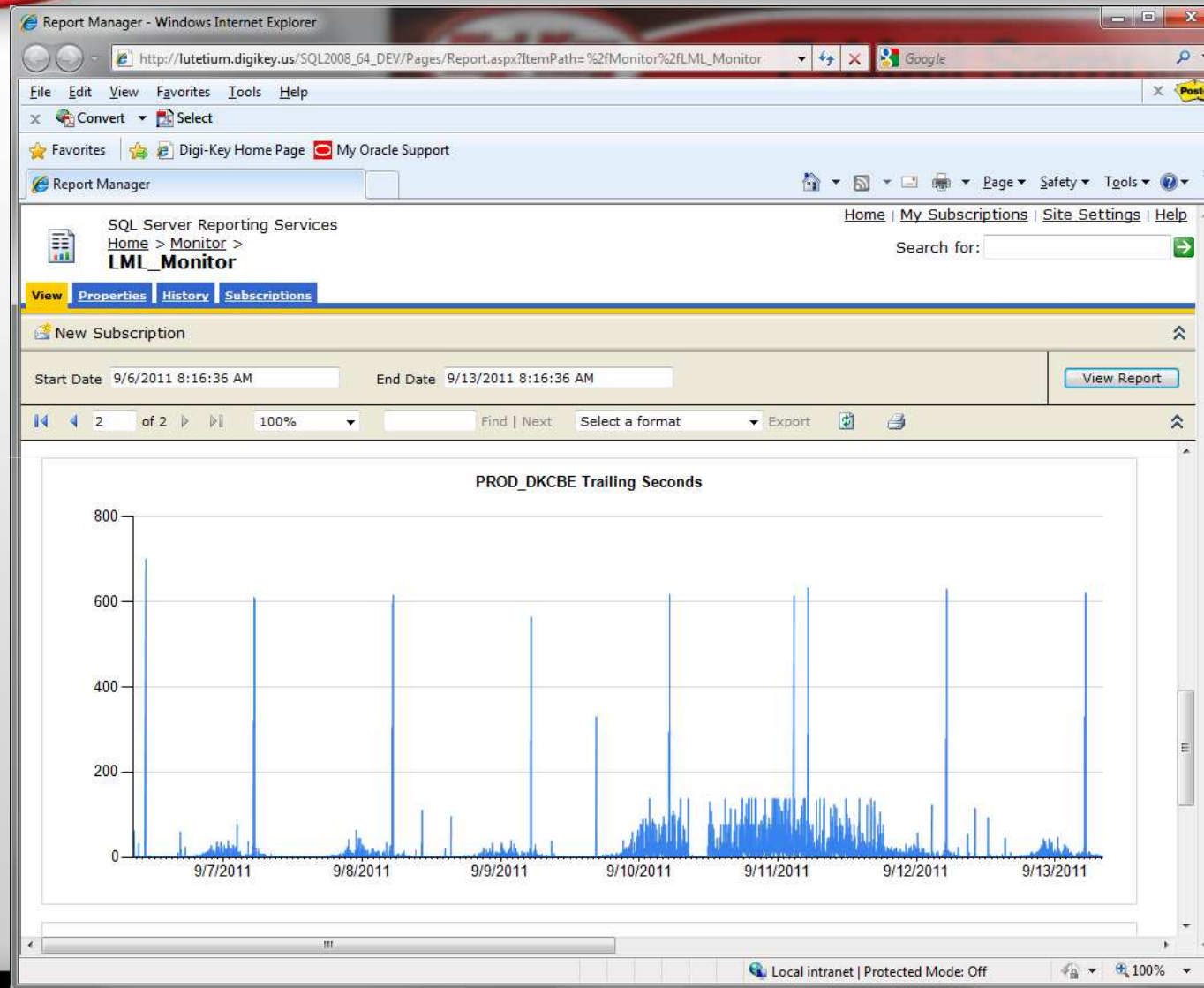
Message from user LOGMINER on BAMBOO

JCCSTAT: JCC Loader 'PROD\_DKCB E' is below tardy interval of 600.00 seconds; output trailing realtime by 0.00 seconds

LML Session has caught-up..



# Dashboard View





## Up / Down E-Mail

- Currently we receive a re-start e-mail only
  - We have a “watchdog” process to start LML sessions if not running
- This doesn't tell us when a session goes down, rather that one has restarted
  - It does attempt to include any error messages from the log file
- Could get to near real-time session down notifications but have not done so yet



# Restart E-Mail Sample

## BAMBOO PROD\_MDMS Logminer Down - Restarting Now

From: logminer@prod.dec.dkc.com

\*\*\*\*\*

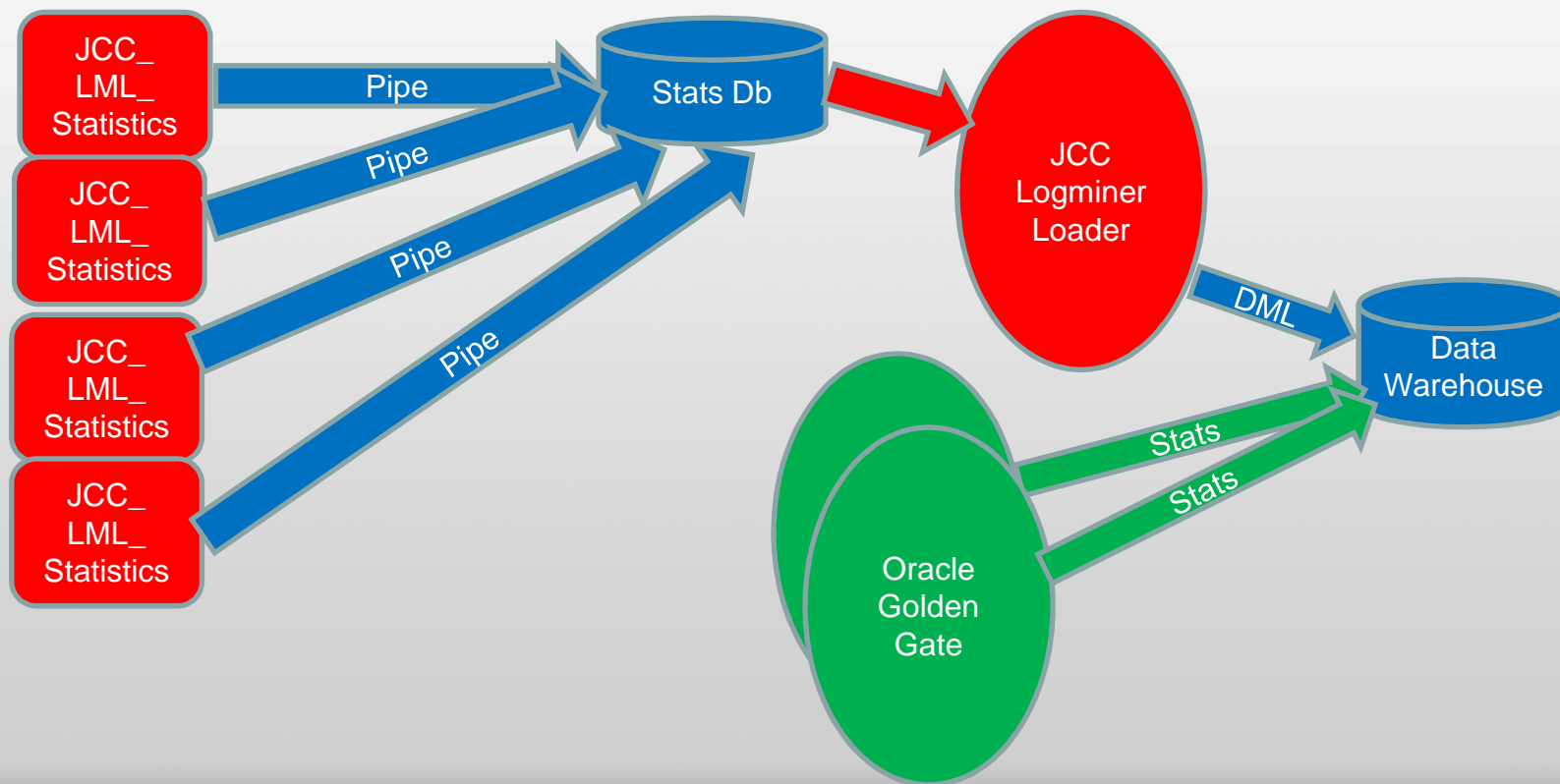
V107:[JCC\_LML\_LOGS]JCC\_RUN\_LML-PROD\_MDMS.LOG;3

```
12-SEP-2011 08:37:51.28 22A0C49A ||0 PROD_MDMS %dba_put_oci_output: Fatal Exception on table IN_PART_PARENT_CHILD_REC in Open step
12-SEP-2011 08:37:51.28 22A0C49A ||0 PROD_MDMS Statement: declare lm_action char(1); t_rowid urowid; c1 NUMBER(10); c2 NUMBER(10);
c3 NUMBER(10); c4 NUMBER(10); c5 NUMBER(3); c6 TIMESTAMP(9); c7 CHAR(1); begin lm_action := :lm; c1 := :c1; c2 := :c2; c3 := :c3; c4 := :c4;
c5 := :c5; c6 := to_timestamp(:c6,'YYYY-MM-DD HH24:MI:SS.FF'); c7 := :c7; t_rowid := NULL;
begin select rowid into t_rowid from IN_PART_PARENT_CHILD_REC where PART_RELATIONSHIP_ID = c3 ;
exception when NO_DATA_FOUND then t_rowid := NULL; end; if (lm_action in ('M','D')) then if
(t_rowid is Not Null) then update IN_PART_PARENT_CHILD_REC set CHILD_PART_ID = c1,
PARENT_PART_ID = c2,QTY = c4,CODE_ASSOCIATION_TYPE = c5,TRANSACTION_COMMIT_TIME = c6,
FLAG_ACTION = c7 where rowid = t_rowid; else insert into IN_PART_PARENT_CHILD_REC
(CHILD_PART_ID,PARENT_PART_ID,PART_RELATIONSHIP_ID,QTY,CODE_ASSOCIATION_TYPE,
TRANSACTION_COMMIT_TIME,FLAG_ACTION) values (c1,c2,c3,c4,c5,c6,c7); end if; end if; end;
12-SEP-2011 08:37:51.30 22A0C49A ||0 PROD_MDMS %jcc_logminer_loader: ended with an exception: %DBA-E-MAX_OUT_RETRIES, Maximum
message output failures received.
12-SEP-2011 08:37:51.33 22A0C49A ||0 PROD_MDMS [redisplay of exception information follows for convenience.]
12-SEP-2011 08:37:51.33 22A0C49A ||0 PROD_MDMS %jcc_logminer_loader: ended with an exception: %DBA-E-MAX_OUT_RETRIES, Maximum
message output failures received.
12-SEP-2011 08:37:51.39 22A0C49A ||0 PROD_MDMS %DBA-E-MAX_OUT_RETRIES, Maximum message output failures received.
12-SEP-2011 08:37:51.39 22A0C49A ||0 PROD_MDMS %DBA-E-MAX_OUT_RETRIES, Maximum message output failures received.
12-SEP-2011 08:37:51.48 22A0C49A ||0 PROD_MDMS %DBA-E-MAX_OUT_RETRIES, Maximum message output failures received.
12-SEP-2011 08:37:51.55 22A0C49A ||0 PROD_MDMS %NONAME-E-NOMSG, Message number 080A83D2
```



# Centralized Reporting

- Can use LML to push these stats into DW
- Combine with other system stats





# Conclusion

- Having statistics data available in a database facilitates numerous reporting needs.
- With near real-time monitoring and notifications it is easier to manage many CDC processes enterprise-wide.





# Q & A

- Questions?





# My Contact Info



[Miles.Oustad@digikkey.com](mailto:Miles.Oustad@digikkey.com)

218-681-6674 x2972

Long Live Rdb!