JENNIFER
JENNIFERSOFT, Inc.

Case Study:
Application Delay from Misconfigured JDBC Connection

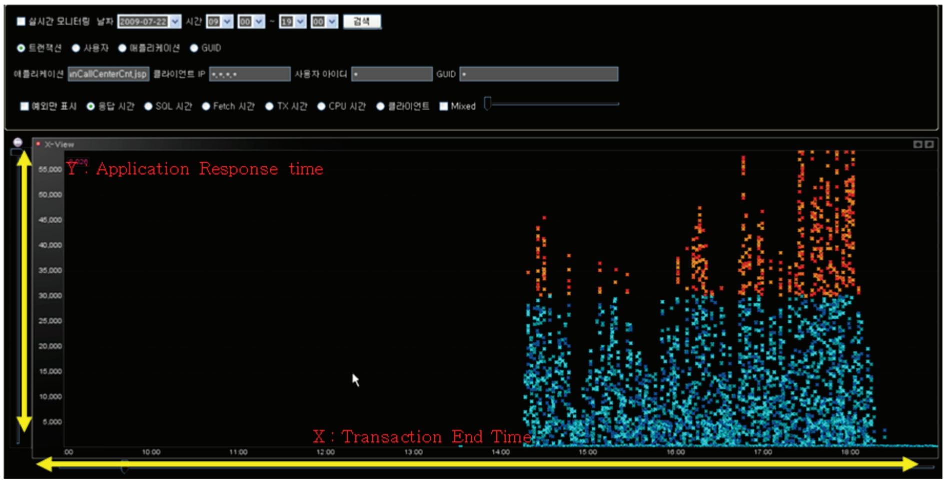
Background

System "B" is a portal system for "G" County providing various administration services to residents of the county. Average Concurrent User count is approximately 200 users and hourly visitor count is approximately 1000 users per hour.

System Administrator had tested problematic applications in the test environment without any problem, however, as soon as the applications were launched in production, user complaints started rolling in about poor performance and delayed service time. In order to resolve the performance problem, administrator performed analysis at OS, Application Server, and Database level but could not identify the cause of poor application performance.

Analysis of Cause

JENNIFER was installed on servers running problematic applications and administrator performed analysis using JENNIFER. As you can see in the below graph, there is a significant delay in response time of application services after 14:00 hr, since new applications were launched.



□ 실시간 모니터링 날자 2009-07-22 시간 09 00 ~ 19 00 검색

● 트랜잭션 ○ 사용자 ○ 애플리케이션 ○ GUID

애플리케이션 inCallCenterCnt.jsp 클라이언트 IP *.*.*.* 사용자 아이디 * GUID *

□ 예외만 표시 ● 응답 시간 ○ SQL 시간 ○ Fetch 시간 ○ TX 시간 ○ CPU 시간 ○ 클라이언트 □ Mixed

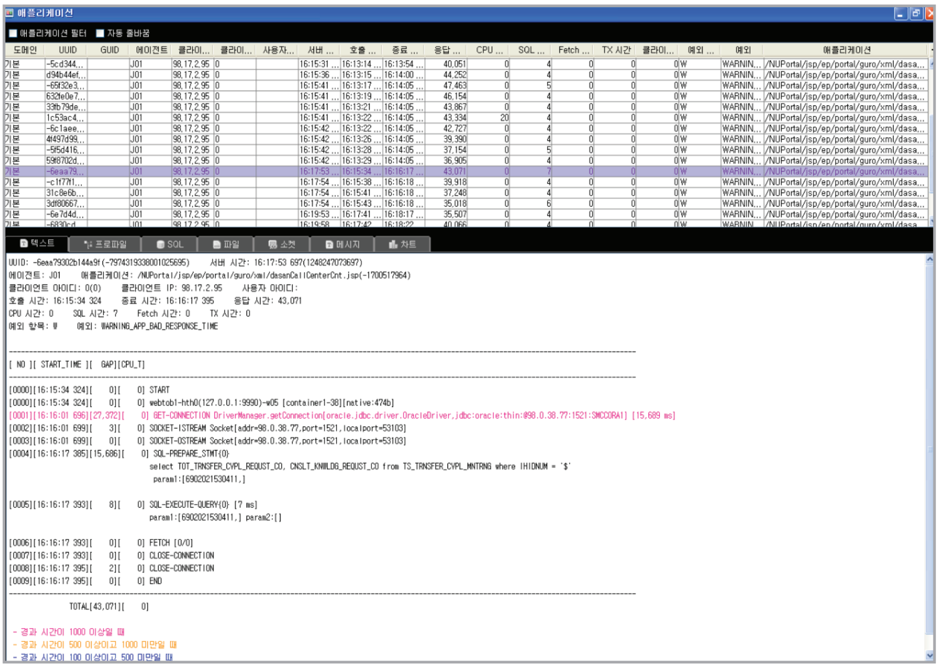
[Pic 1 : X–view Graph]

X-view

JENNIFER's X-View Graph displays response time of all service transactions processed in the application servers, individually in a scatter graph format. Y-axis is the Application Response Time and X-axis is the end time of each service transaction. X-View allows administrator to perceive the status of application performance quickly and in detail.

Monitoring with X-View, Administrator can see the sudden delay in application response time, some times above 30 seconds. (JENNIFER marks transactions with more than 30 seconds in red color, making them more visible in the graph for fast perception of performance problem.)

Select a group of delayed service transaction in X-View to bring up their detailed information.



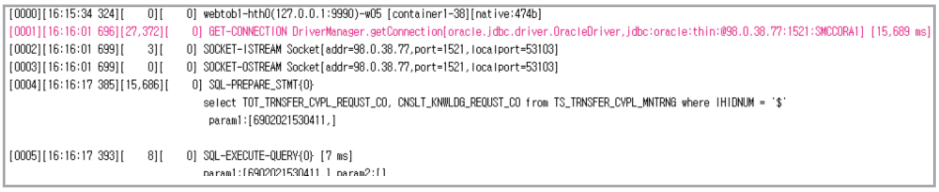
애플리케이션

□ 애플리케이션 필터 □ 자동 줄바꿈

도메인	UUID	GUID	에이전트	클라이...	클라이...	사용자...	서버 ...	호출 ...	종료 ...	응답 ...	CPU ...	SQL ...	Fetch ...	TX 시간	클라이...	예외 ...	예외	애플리케이션
기본	-5cd344...		J01	98.17.2.95	0		16:15:31 ...	16:13:14 ...	16:13:54 ...	40,051	0	4	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	d94b44ef...		J01	98.17.2.95	0		16:15:36 ...	16:13:15 ...	16:14:00 ...	44,252	0	4	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	-65f32e3...		J01	98.17.2.95	0		16:15:41 ...	16:13:17 ...	16:14:05 ...	47,463	0	5	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	632fe0e7...		J01	98.17.2.95	0		16:15:41 ...	16:13:19 ...	16:14:05 ...	46,154	0	4	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	33fb79de...		J01	98.17.2.95	0		16:15:41 ...	16:13:21 ...	16:14:05 ...	43,867	0	4	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	1c53ac4...		J01	98.17.2.95	0		16:15:41 ...	16:13:22 ...	16:14:05 ...	43,334	20	4	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	-6c1aee...		J01	98.17.2.95	0		16:15:42 ...	16:13:22 ...	16:14:05 ...	42,727	0	4	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	4f497d99...		J01	98.17.2.95	0		16:15:42 ...	16:13:26 ...	16:14:05 ...	39,390	0	4	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	-5f5d416...		J01	98.17.2.95	0		16:15:42 ...	16:13:28 ...	16:14:05 ...	37,154	0	5	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	59f8702d...		J01	98.17.2.95	0		16:15:42 ...	16:13:29 ...	16:14:05 ...	36,905	0	4	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	-6eaa79...		J01	98.17.2.95	0		16:17:53 ...	16:15:34 ...	16:16:17 ...	43,071	0	7	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	-c1f77f1...		J01	98.17.2.95	0		16:17:54 ...	16:15:38 ...	16:16:18 ...	39,918	0	4	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	31c8e6b...		J01	98.17.2.95	0		16:17:54 ...	16:15:41 ...	16:16:18 ...	37,248	0	4	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	3df80667...		J01	98.17.2.95	0		16:17:54 ...	16:15:43 ...	16:16:18 ...	35,018	0	6	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	-6e7d4d...		J01	98.17.2.95	0		16:19:53 ...	16:17:41 ...	16:18:17 ...	35,507	0	4	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa...
기본	-6830cd...		J01	98.17.2.95	0		16:19:58	16:17:42	16:18:22	40,066	0	4	0	0	0	W	WARNIN...	/NUPortal/jsp/ep/portal/guro/xml/dasa

```
UUID: -6eaa79302b144a9f(-7974319338001025695)     서버 시간: 16:17:53 697(1248247073697)
에이전트: J01     애플리케이션: /NUPortal/jsp/ep/portal/guro/xml/dasanCallCenterCnt.jsp(-1700517964)
클라이언트 아이디: 0(0)     클라이언트 IP: 98.17.2.95     사용자 아이디:
호출 시간: 16:15:34 324     종료 시간: 16:16:17 395     응답 시간: 43,071
CPU 시간: 0     SQL 시간: 7     Fetch 시간: 0     TX 시간: 0
예외 항목: W     예외: WARNING_APP_BAD_RESPONSE_TIME

-----------------------------------------------------------------------------------------------------------------
[ NO ][ START_TIME ][  GAP][CPU_T]
-----------------------------------------------------------------------------------------------------------------
[0000][16:15:34 324][     0][     0] START
[0000][16:15:34 324][     0][     0] webtob1-hth0(127.0.0.1:9990)-w05 [container1-38][native:474b]
[0001][16:16:01 696][27,372][     0] GET-CONNECTION DriverManager.getConnection[oracle.jdbc.driver.OracleDriver,jdbc:oracle:thin:@98.0.38.77:1521:SMCCORA1] [15,689 ms]
[0002][16:16:01 699][     3][     0] SOCKET-ISTREAM Socket[addr=98.0.38.77,port=1521,localport=53103]
[0003][16:16:01 699][     0][     0] SOCKET-OSTREAM Socket[addr=98.0.38.77,port=1521,localport=53103]
[0004][16:16:17 385][15,686][     0] SQL-PREPARE_STMT{0}
                                    select TOT_TRNSFER_CVPL_REQUST_CO, CNSLT_KNWLDG_REQUST_CO from TS_TRNSFER_CVPL_MNTRNG where IHIDNUM = '$'
                                     param1:[6902021530411,]

[0005][16:16:17 393][     8][     0] SQL-EXECUTE-QUERY{0} [7 ms]
                                    param1:[6902021530411,] param2:[]

[0006][16:16:17 393][     0][     0] FETCH [0/0]
[0007][16:16:17 393][     0][     0] CLOSE-CONNECTION
[0008][16:16:17 395][     2][     0] CLOSE-CONNECTION
[0009][16:16:17 395][     0][     0] END
-----------------------------------------------------------------------------------------------------------------
               TOTAL[43,071][     0]

 - 경과 시간이 1000 이상일 때
 - 경과 시간이 500 이상이고 1000 미만일 때
 - 경과 시간이 100 이상이고 500 미만일 때
```

[Pic 2: Transaction Profile]



```
[0000][16:15:34 324][     0][     0] webtob1-hth0(127.0.0.1:9990)-w05 [container1-38][native:474b]
[0001][16:16:01 696][27,372][     0] GET-CONNECTION DriverManager.getConnection[oracle.jdbc.driver.OracleDriver,jdbc:oracle:thin:@98.0.38.77:1521:SMCCORA1] [15,689 ms]
[0002][16:16:01 699][     3][     0] SOCKET-ISTREAM Socket[addr=98.0.38.77,port=1521,localport=53103]
[0003][16:16:01 699][     0][     0] SOCKET-OSTREAM Socket[addr=98.0.38.77,port=1521,localport=53103]
[0004][16:16:17 385][15,686][     0] SQL-PREPARE_STMT{0}
                                    select TOT_TRNSFER_CVPL_REQUST_CO, CNSLT_KNWLDG_REQUST_CO from TS_TRNSFER_CVPL_MNTRNG where IHIDNUM = '$'
                                     param1:[6902021530411,]

[0005][16:16:17 393][     8][     0] SQL-EXECUTE-QUERY{0} [7 ms]
                                    param1:[6902021530411,] param2:[]
```

[Pic 3: Analysis of Delay in Response Time]

Analying with JENNIFER, Administrator has discovered that problematic applications were not using Application server's resident JDBC Manager, which controls database connection pool. Instead, applications were using its in-house developed JDBC manager to control access to database which was grossly inefficient.

Conclusion

Some application code errors are not fixed during testing stage since they can be detected only in the production environment; this case was one such case. Since Test environment cannot simulate all scenarios found in production environment, an effective production monitoring is a must to maintain constant service level.

Key Message :

1. Not all application problems are discovered in Test phase of application development. Some application problem can be detected only in production phase. In this case, Administrator did not discover the application problem until users started complaining about poor application performance.
2. Often, misconfiguration or small portions of bad coding gone undetected in testing environment are culprit of major performance problem in production environment. While some of these errors are simply unavoidable, having a proactive production monitoring practice ensures good system performance.

Transaction Profile

Selects one or more service transactions from X-View and Transaction Profile window will pop-up automatically, providing detailed transaction information, such as File I/O, Network I/O, JDBC Status, Method/Class level Profiling, and Database Query and Parameter

Note

JENNIFER Review Downloads:
http://www.jennifersoft.com/docs/apm-jennifer-installation--file-download.html

JENNIFER Introduction Documents:
http://www.jennifersoft.com/docs/apm-jennifer-documents.html