

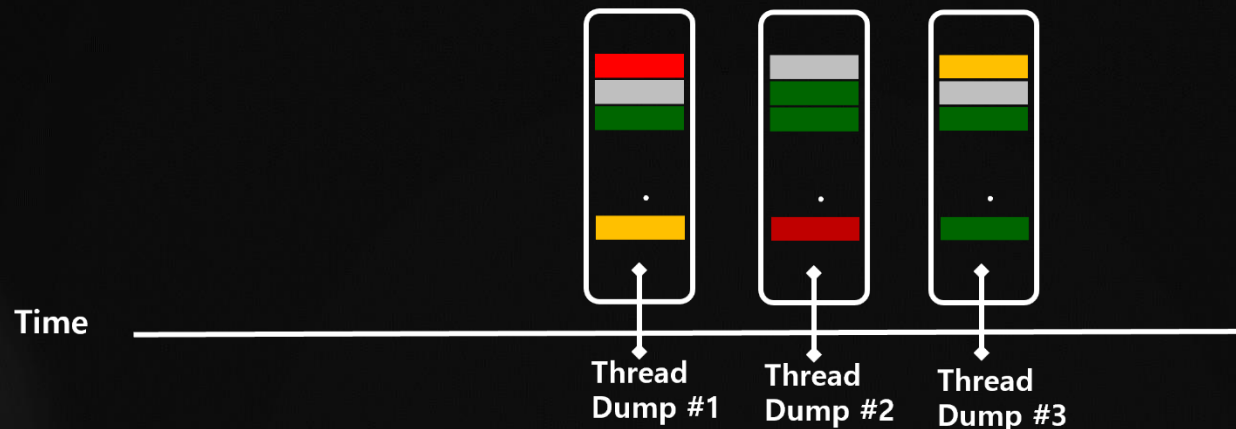
Troubleshooting – Java Thread 분석

WAS Troubleshooting Service

Java 스레드 덤프 분석방법

Java 스레드 덤프

- 스레드 덤프란?
 - JVM 내부에서 현재 수행중인 스레드의 SnapShot을 텍스트로 출력
 - 서버 Hang, 서버 Slowdown등 서버에서 발생하는 문제를 해결하는 가장 유용한 도구
 - 약 3~5초간격으로 3~5회 연속해서 스레드 덤프를 받아야 분석이 가능하다
- 언제 받아야 하나?
 - 운영 중인 서버에서도 수행가능(많은 시간이 걸리지 않는 작업임)
 - 서버 Hang, Slowdown시, 서버가 Crash되거나 OutOfMemory가 발생한 직후에 받는 것이 좋음

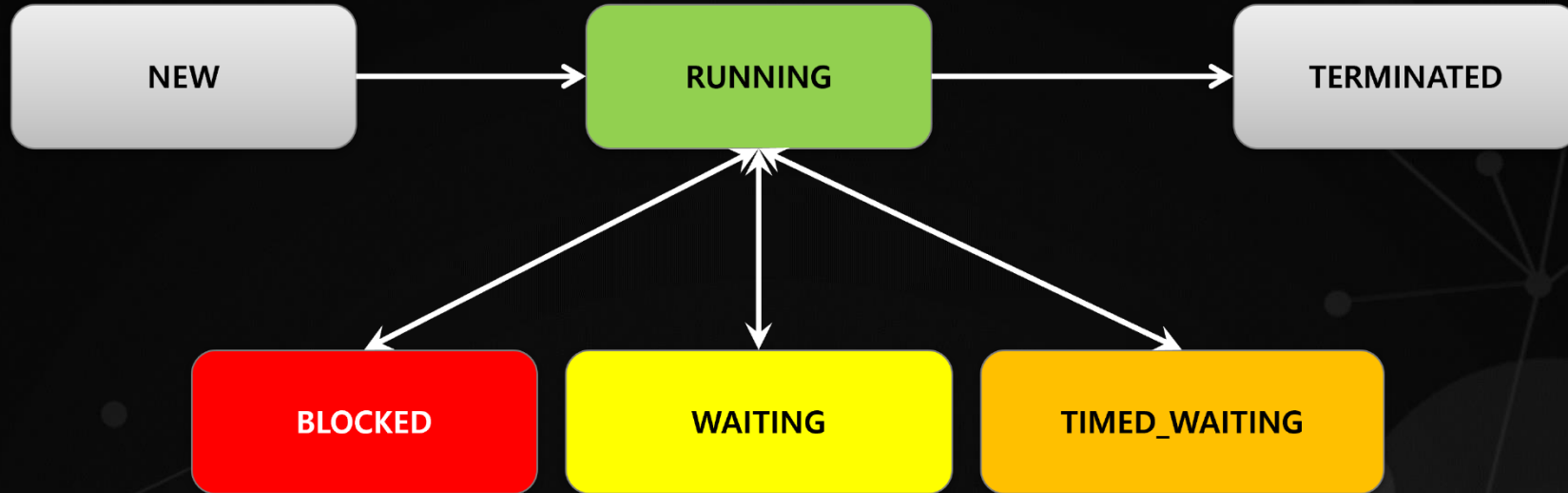


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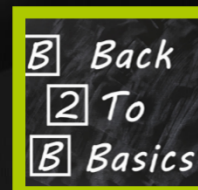
개념과 배경지식

Thread 상태

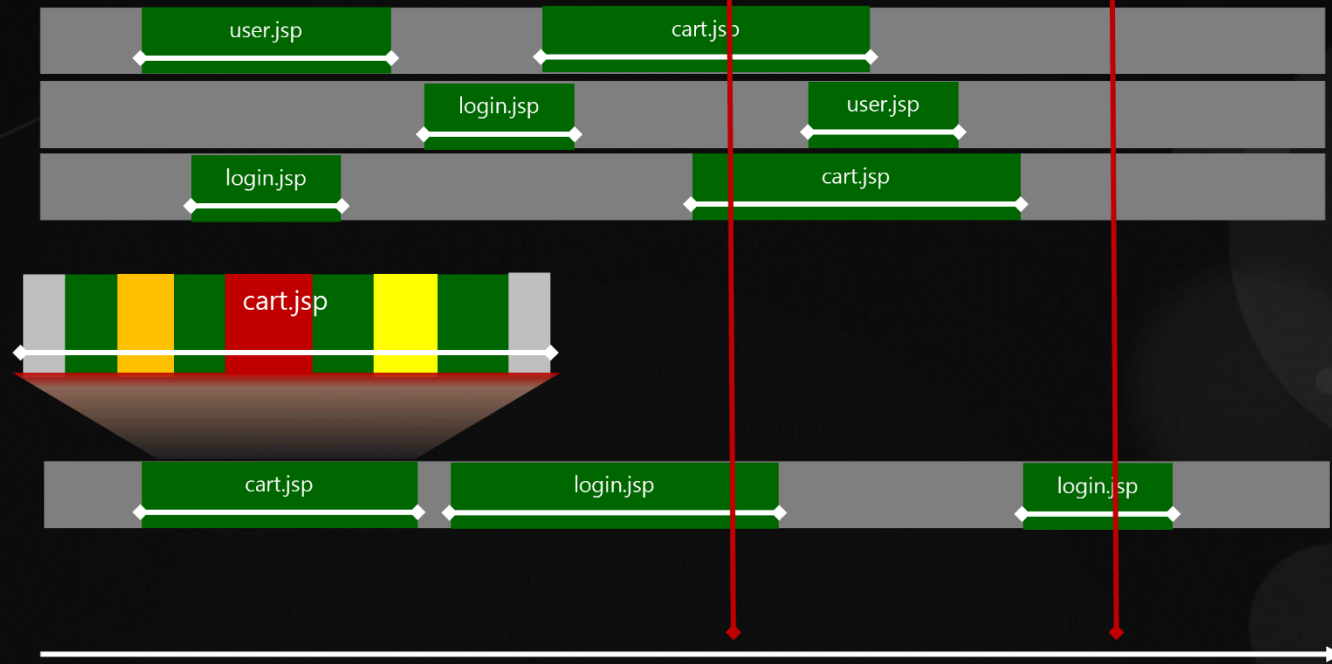
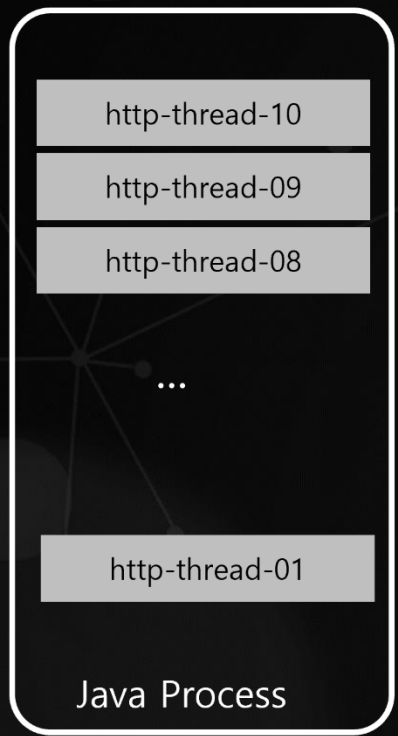
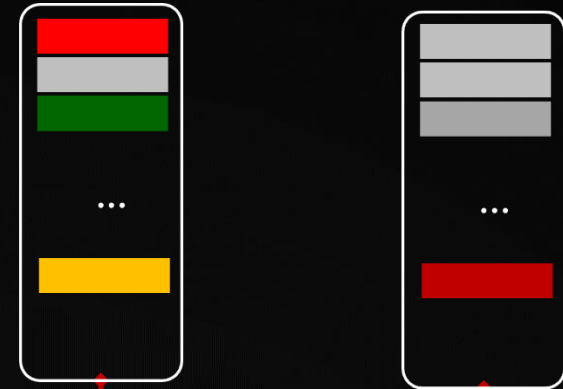
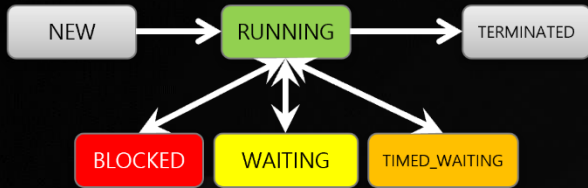
- `java.lang.Thread.State`



- **NEW** – 생성되어있지만 실행되지 않은 상태
- **RUNNING** – 작업 수행 중
- **BLOCKED** – 다른 스레드의 Lock 해제를 기다리는 중
- **WAITING** – `wait()`, `join()`, `park()` 메소드로 대기 중
- **TIMED_WAITING** – **WAITING**과 같지만, 정해진 시간만 대기
- **TERMINATED** – 종료됨



Java Thread Dump의 이해



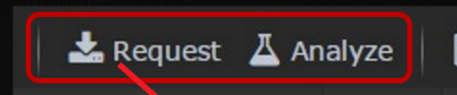
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개념과 배경지식

스레드 덤프 받는 방법은?

- Linux / UNIX 시스템에서 스레드 덤프
 - kill -3 <PID>
 - 일반적을 nohup 명령을 이용하여 시작하기 때문에
 - nohup.out파일에 stdout 로그가 남게 됨
 - 윈도우에서는 Ctrl + Break
 - OPENMARU Installer 설치 WAS : s1 □ ./dump.sh
 - OPENMARU APM 화면에서 버튼 클릭(장애시 자동 생성)



- Container 와 OpenShift 환경

- 스레드 덤프를 어떻게 받나?
- docker exec -it c4343003c1 /bin/bash
~# kill -3 <PID>
- 내용을 어떻게 복사? nohup 로그는 남기나?
- docker cp c4343003c1:/file/path/nohup.out /host/path/target
- OPENMARU APM은 Openshift, Docker를 지원 □ 버튼 클릭 & 분석 UI 제공

in...	Type	Time	State	URL	Duration(ms)	CPU
323	Active Thread	http-thread-pool-threads - 250	WAITING	/popup/simple/cer...	408,302	
456	Active Thread	http-thread-pool-0 [http-thread-pool-threads-250]		/popup/simple/cer...	406,944	
589	Active Thread	http-thread-pool-threads - 248	WAITING	/popup/simple/cer...	410,976	
722	Active Thread	http-thread-pool-threads - 247	WAITING	/popup/simple/cer...	411,456	
855	Active Thread	http-thread-pool-threads - 246	WAITING	/popup/simple/cer...	411,474	
988	Active Thread	http-thread-pool-threads - 245	WAITING	/popup/simple/cer...	406,328	
1,121	Active Thread	http-thread-pool-threads - 244	WAITING	/popup/simple/cer...	405,695	
1,254	Active Thread	http-thread-pool-threads - 243	WAITING	/popup/simple/cer...	410,276	
1,387	Active Thread	http-thread-pool-threads - 242	WAITING	/popup/simple/cer...	406,761	
1,520	Active Thread	http-thread-pool-threads - 241	WAITING	/popup/simple/cer...	406,228	

33442	- <@x000000789e645d8> (a java.util.concur
33443	
33444	"http-thread-pool-threads - 1" prio=10 tid=0x0
33445	java.lang.Thread.State: WAITING (parking)
33446	at sun.misc.Unsafe.park(Native Method)
33447	- parking to wait for <@x000000788bf5578
33448	at java.util.concurrent.locks.LockSupport.p
33449	at java.util.concurrent.locks.AbstractQueu
33450	at org.apache.http.pool.AbstractConnPool.g
33451	at org.apache.http.pool.AbstractConnPool.#
33452	at org.apache.http.pool.AbstractConnPool\$2
33453	- locked <@x0000007935132e8> (a org.apache
33454	at org.apache.http.pool.AbstractConnPool\$2
33455	at org.apache.http.impl.conn.PoolingHttpCl
33456	at org.apache.http.impl.conn.PoolingHttpCl
33457	at org.apache.http.impl.execchain.MainClie
33458	at org.apache.http.impl.execchain.Protocol
33459	at org.apache.http.impl.execchain.RetryExe
33460	at org.apache.http.impl.execchain.Redirect
33461	at org.apache.http.impl.client.InternalHttp
33462	***



진단 및 모니터링

스레드 덤프의 정보 구성

- 스레드 덤프의 각 스레드의 정보 구성



스레드 이름 우선순위 스레드ID OS 스레드ID 스레드 상태

```

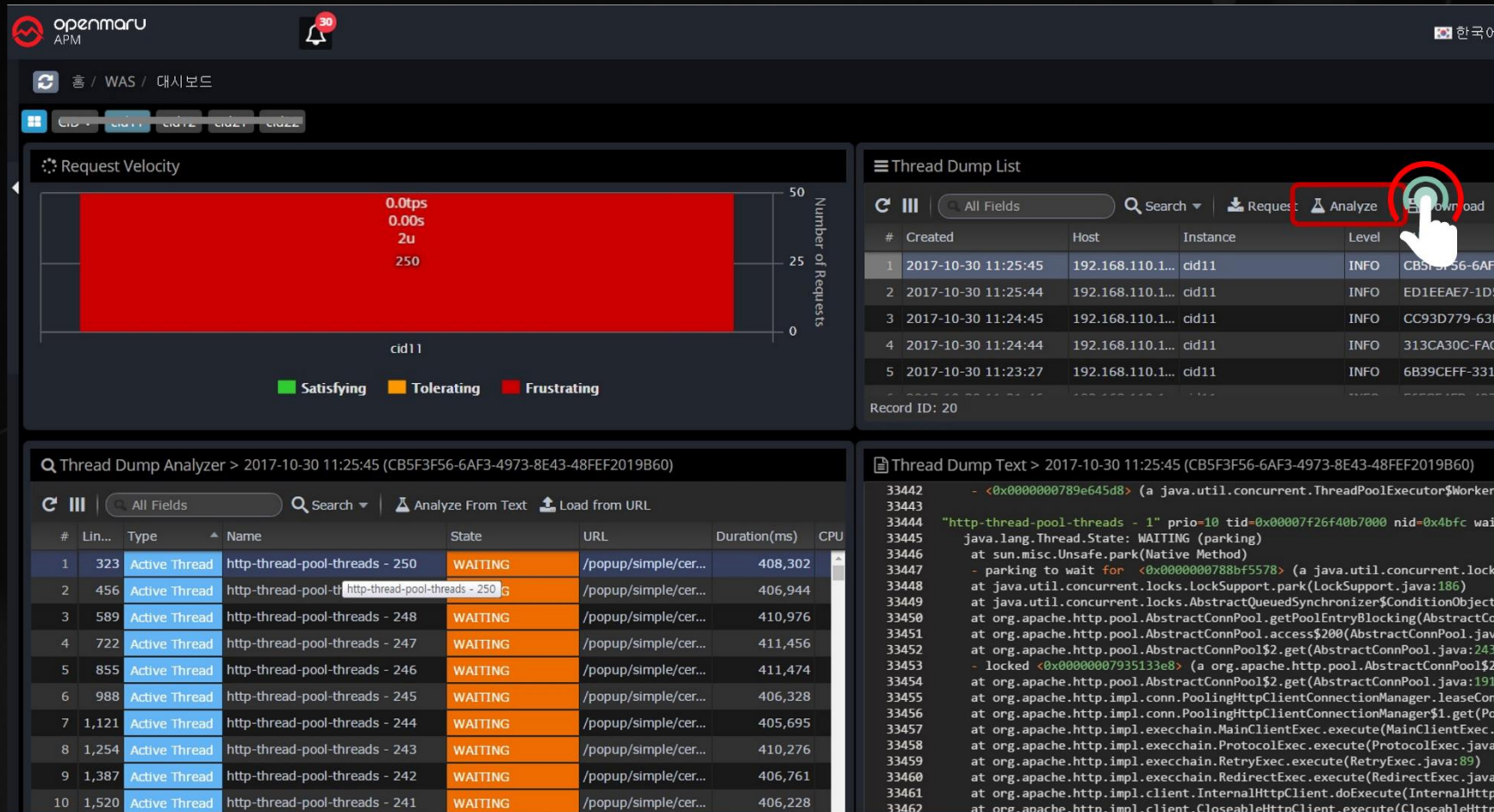
"http-thread-pool-threads - 250" prio=1( tid=0x00007fab9c192800 nid=0xdbc9 waiting on condition [0x00007faa6ce2c000]
  java.lang.Thread.State: WAITING (parking)
    at sun.misc.Unsafe.park(Native Method)
    - parking to wait for <0x000000078b428170> (a java.util.concurrent.locks.AbstractQueuedSynchronizer$ConditionObject)
    at java.util.concurrent.locks.LockSupport.park(LockSupport.java:186)
    at java.util.concurrent.locks.AbstractQueuedSynchronizer$ConditionObject.await(AbstractQueuedSynchronizer.java:2043)
    at java.util.concurrent.LinkedBlockingQueue.take(LinkedBlockingQueue.java:442)
    at java.util.concurrent.ThreadPoolExecutor.getTask(ThreadPoolExecutor.java:1068)
    at java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1130)
    at java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:615)
    at java.lang.Thread.run(Thread.java:744)
    at org.jboss.threads.JBossThread.run(JBossThread.java:122)
  
```

스레드 호출 Stack

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OPENMARU APM에서 스레드 덤프 생성 방법

- 대시보드 → Request Velocity의 빨간색 클릭 → '요청' 버튼 클릭
- WAS → Instance → [호스트명] → [인스턴스 이름] → 스레드 덤프 분석 → '요청' 버튼 클릭
- <자동생성 조건> 이벤트 → 경고정책 → Pending Transaction이 Critical 조건이 되면 자동생성



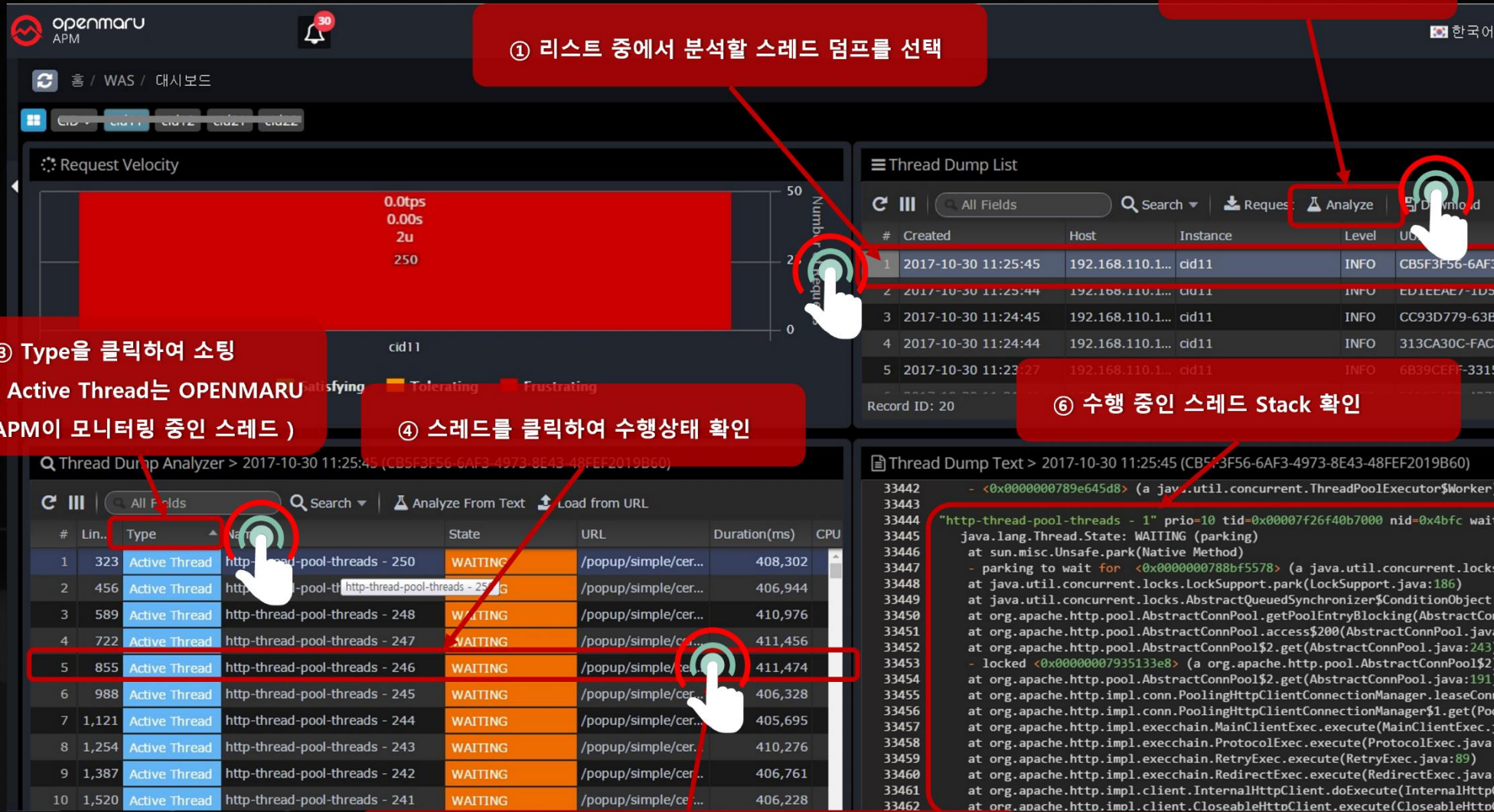
The screenshot displays the Openmaru APM interface. The top left shows the 'Request Velocity' chart for instance 'cid11', with a red bar indicating a 'Frustrating' state. The top right shows the 'Thread Dump List' table with columns for #, Created, Host, Instance, and Level. A red circle highlights the 'Analyze' button in the top right of the Thread Dump List. The bottom left shows the 'Thread Dump Analyzer' table with columns for #, Lin..., Type, Name, State, URL, Duration(ms), and CPU. The bottom right shows the 'Thread Dump Text' view with a stack trace for a 'java.util.concurrent.ThreadPoolExecutor\$Worker' thread.

#	Created	Host	Instance	Level
1	2017-10-30 11:25:45	192.168.110.1...	cid11	INFO
2	2017-10-30 11:25:44	192.168.110.1...	cid11	INFO
3	2017-10-30 11:24:45	192.168.110.1...	cid11	INFO
4	2017-10-30 11:24:44	192.168.110.1...	cid11	INFO
5	2017-10-30 11:23:27	192.168.110.1...	cid11	INFO

#	Lin...	Type	Name	State	URL	Duration(ms)	CPU
1	323	Active Thread	http-thread-pool-threads - 250	WAITING	/popup/simple/cer...	408,302	
2	456	Active Thread	http-thread-pool-threads - 250	WAITING	/popup/simple/cer...	406,944	
3	589	Active Thread	http-thread-pool-threads - 248	WAITING	/popup/simple/cer...	410,976	
4	722	Active Thread	http-thread-pool-threads - 247	WAITING	/popup/simple/cer...	411,456	
5	855	Active Thread	http-thread-pool-threads - 246	WAITING	/popup/simple/cer...	411,474	
6	988	Active Thread	http-thread-pool-threads - 245	WAITING	/popup/simple/cer...	406,328	
7	1,121	Active Thread	http-thread-pool-threads - 244	WAITING	/popup/simple/cer...	405,695	
8	1,254	Active Thread	http-thread-pool-threads - 243	WAITING	/popup/simple/cer...	410,276	
9	1,387	Active Thread	http-thread-pool-threads - 242	WAITING	/popup/simple/cer...	406,761	
10	1,520	Active Thread	http-thread-pool-threads - 241	WAITING	/popup/simple/cer...	406,228	

```
33442 - <0x0000000789e645d8> (a java.util.concurrent.ThreadPoolExecutor$Worker)
33443
33444 "http-thread-pool-threads - 1" prio=10 tid=0x00007f26f40b7000 nid=0x4bfc wait
33445 java.lang.Thread.State: WAITING (parking)
33446   at sun.misc.Unsafe.park(Native Method)
33447   - parking to wait for <0x0000000788bf5578> (a java.util.concurrent.locks
33448   at java.util.concurrent.locks.LockSupport.park(LockSupport.java:186)
33449   at java.util.concurrent.locks.AbstractQueuedSynchronizer$ConditionObject
33450   at org.apache.http.pool.AbstractConnPool$2.get(AbstractConnPool.java:243)
33451   at org.apache.http.pool.AbstractConnPool.access$200(AbstractConnPool.java:191)
33452   at org.apache.http.pool.AbstractConnPool$2.get(AbstractConnPool.java:243)
33453   - locked <0x00000007935133e8> (a org.apache.http.pool.AbstractConnPool$2)
33454   at org.apache.http.pool.AbstractConnPool$2.get(AbstractConnPool.java:191)
33455   at org.apache.http.impl.conn.PoolingHttpClientConnectionManager.leaseConn
33456   at org.apache.http.impl.conn.PoolingHttpClientConnectionManager$1.get(Poo
33457   at org.apache.http.impl.execchain.MainClientExec.execute(MainClientExec.j
33458   at org.apache.http.impl.execchain.ProtocolExec.execute(ProtocolExec.java:
33459   at org.apache.http.impl.execchain.RetryExec.execute(RetryExec.java:89)
33460   at org.apache.http.impl.execchain.RedirectExec.execute(RedirectExec.java:
33461   at org.apache.http.impl.client.InternalHttpClient.doExecute(InternalHttpC
33462   at org.apache.http.impl.client.CloseableHttpClient.execute(CloseableHttpC
```


OPENMARU APM에서 스레드 덤프 간단 분석 방법



① 리스트 중에서 분석할 스레드 덤프를 선택

② '분석' 버튼을 클릭

③ Type을 클릭하여 소팅
(Active Thread는 OPENMARU APM이 모니터링 중인 스레드)

④ 스레드를 클릭하여 수행상태 확인

⑤ 스레드가 수행중인 URL, 수행시간, CPU 사용시간 확인

⑥ 수행 중인 스레드 Stack 확인

#	Created	Host	Instance	Level	URL
1	2017-10-30 11:25:45	192.168.110.1...	cid11	INFO	CBF5F3F56-6AF3...
2	2017-10-30 11:25:44	192.168.110.1...	cid11	INFO	ED1EEAE7-1D5F...
3	2017-10-30 11:24:45	192.168.110.1...	cid11	INFO	CC93D779-63B5...
4	2017-10-30 11:24:44	192.168.110.1...	cid11	INFO	313CA30C-FAC6...
5	2017-10-30 11:23:27	192.168.110.1...	cid11	INFO	6B39CEFF-3315...

#	Lin..	Type	Name	State	URL	Duration(ms)	CPU
1	323	Active Thread	http-thread-pool-threads - 250	WAITING	/popup/simple/cer...	408,302	
2	456	Active Thread	http-thread-pool-threads - 250	WAITING	/popup/simple/cer...	406,944	
3	589	Active Thread	http-thread-pool-threads - 248	WAITING	/popup/simple/cer...	410,976	
4	722	Active Thread	http-thread-pool-threads - 247	WAITING	/popup/simple/cer...	411,456	
5	855	Active Thread	http-thread-pool-threads - 246	WAITING	/popup/simple/cer...	411,474	
6	988	Active Thread	http-thread-pool-threads - 245	WAITING	/popup/simple/cer...	406,328	
7	1,121	Active Thread	http-thread-pool-threads - 244	WAITING	/popup/simple/cer...	405,695	
8	1,254	Active Thread	http-thread-pool-threads - 243	WAITING	/popup/simple/cer...	410,276	
9	1,387	Active Thread	http-thread-pool-threads - 242	WAITING	/popup/simple/cer...	406,761	
10	1,520	Active Thread	http-thread-pool-threads - 241	WAITING	/popup/simple/cer...	406,228	

```
33442 - <0x000000789e645d8> (a java.util.concurrent.ThreadPoolExecutor$Worker)
33443
33444
33445 "http-thread-pool-threads - 1" prio=10 tid=0x00007f26f40b7000 nid=0x4bfc wait
33446 java.lang.Thread.State: WAITING (parking)
33447   at sun.misc.Unsafe.park(Native Method)
33448   - parking to wait for <0x0000000788bf5578> (a java.util.concurrent.locks
33449   at java.util.concurrent.locks.LockSupport.park(LockSupport.java:186)
33450   at java.util.concurrent.locks.AbstractQueuedSynchronizer$ConditionObject
33451   at org.apache.http.pool.AbstractConnPool.getPoolEntryBlocking(AbstractCon
33452   at org.apache.http.pool.AbstractConnPool.access$200(AbstractConnPool.java
33453   at org.apache.http.pool.AbstractConnPool$2.get(AbstractConnPool.java:243)
33454   - locked <0x00000007935133e8> (a org.apache.http.pool.AbstractConnPool$2)
33455   at org.apache.http.pool.AbstractConnPool$2.get(AbstractConnPool.java:191)
33456   at org.apache.http.impl.conn.PoolingHttpClientConnectionManager.leaseConn
33457   at org.apache.http.impl.conn.PoolingHttpClientConnectionManager$1.get(Poo
33458   at org.apache.http.impl.execchain.MainClientExec.execute(MainClientExec.j
33459   at org.apache.http.impl.execchain.ProtocolExec.execute(ProtocolExec.java:
33460   at org.apache.http.impl.execchain.RetryExec.execute(RetryExec.java:89)
33461   at org.apache.http.impl.execchain.RedirectExec.execute(RedirectExec.java:
33462   at org.apache.http.impl.client.InternalHttpClient.doExecute(InternalHttpC
33463   at org.apache.http.impl.client.CloseableHttpClient.execute(CloseableHttpC
```

WAS Troubleshooting Service

스레드 덤프 분석 패턴

스레드 덤프 분석 주요 패턴



DB 쿼리가 느릴 때



HTTP 호출이 느릴 때



Logging 처리가 느릴 때



파일 I/O가 느릴 때



Lock이 걸릴 때

스레드 덤프 분석 주요 패턴



DB 쿼리가 느릴 때

```
650 "default task-246" #656 prio=5 os_prio=0 tid=0x00007fe94012d800 nid=0x2a4d runnable [0x00007fe82a440000]
651 java.lang.Thread.State: RUNNABLE
652 at java.net.SocketInputStream.socketRead0(Native Method)
653 at java.net.SocketInputStream.socketRead(SocketInputStream.java:116)
654 at java.net.SocketInputStream.read(SocketInputStream.java:170)
655 at java.net.SocketInputStream.read(SocketInputStream.java:141)
656 at oracle.net.ns.Packet.receive(Packet.java:311)
657 at oracle.net.ns.DataPacket.receive(DataPacket.java:105)
658 at oracle.net.ns.NetInputStream.getNextPacket(NetInputStream.java:305)
659 at oracle.net.ns.NetInputStream.read(NetInputStream.java:249)
660 at oracle.net.ns.NetInputStream.read(NetInputStream.java:171)
661 at oracle.net.ns.NetInputStream.read(NetInputStream.java:89)
662 at oracle.jdbc.driver.T4CSocketInputStreamWrapper.readNextPacket(T4CSocketInputStreamWrapper.java:123)
663 at oracle.jdbc.driver.T4CSocketInputStreamWrapper.read(T4CSocketInputStreamWrapper.java:79)
```

#	Lin.	Type	Name	State	URL	Durati...	CPU Tl...	Class	At	Addr...
1	650	Active Thre	default task-246	RUNNABLE	/cnet/front/exame...	14,403	352.9	java.net.So...	0x000...	
2	924	Active Thre	default task-238	BLOCKED	/cnet/front/exame...	33,986	693.4	org.apache...	0x000...	
3	1,061	Active Thre	default task-236	BLOCKED	/cnet/front/exame...	33,058	628.9	org.apache...	0x000...	
4	1,181	Active Thre	default task-235	BLOCKED	/cnet/front/exame...	39,877	745.3	org.apache...	0x000...	
5	1,588	Active Thre	default task-215	BLOCKED	/cnet/front/exame...	38,246	745.2	org.apache...	0x000...	
6	1,737	Active Thre	default task-212	BLOCKED	/cnet/front/exame...	32,150	637.7	org.apache...	0x000...	
7	1,983	Active Thre	default task-204	BLOCKED	/cnet/front/exame...	30,869	627.5	org.apache...	0x000...	
8	2,117	Active Thre	default task-202	BLOCKED	/cnet/front/exame...	38,711	757.2	org.apache...	0x000...	
9	2,314	Active Thre	default task-196	BLOCKED	/cnet/front/exame...	30,347	608.5	org.apache...	0x000...	
10	2,498	Active Thre	default task-193	BLOCKED	/cnet/front/exame...	38,861	757.6	org.apache...	0x000...	
11	2,620	Active Thre	default task-191	BLOCKED	/cnet/front/exame...	32,901	655.2	org.apache...	0x000...	
12	2,772	Active Thre	default task-188	RUNNABLE	/cnet/front/exame...	34,560	673.6	java.securi...	0x000...	
13	3,143	Active Thre	default task-176	BLOCKED	/cnet/front/exame...	31,438	613.1	org.apache...	0x000...	
14	3,281	Active Thre	default task-174	BLOCKED	/cnet/front/exame...	25,674	559.1	org.apache...	0x000...	
15	3,419	Active Thre	default task-172	RUNNABLE	/cnet/front/exame...	40,398	766.5	java.net.So...	0x000...	
16	3,633	Active Thre	default task-168	BLOCKED	/cnet/front/exame...	26,471	502.3	org.apache...	0x000...	
17	4,007	Active Thre	default task-151	BLOCKED	/cnet/front/exame...	29,606	589.9	org.apache...	0x000...	
18	4,144	Active Thre	default task-149	BLOCKED	/cnet/front/exame...	26,854	555.2	org.apache...	0x000...	
19	4,278	Active Thre	default task-147	BLOCKED	/cnet/front/exame...	27,212	564.5	org.apache...	0x000...	
20	4,400	Active Thre	default task-146	BLOCKED	/cnet/front/memb...	1,145	11.3	org.apache...	0x000...	
21	4,577	Active Thre	default task-143	BLOCKED	/cnet/front/exame...	37,405	694.4	org.apache...	0x000...	
22	5,179	Active Thre	default task-110	BLOCKED	/cnet/front/exame...	28,692	618.0	org.apache...	0x000...	
23	5,302	Active Thre	default task-109	BLOCKED	/cnet/front/exame...	12,069	282.6	org.apache...	0x000...	
24	5,589	Active Thre	default task-98	BLOCKED	/cnet/front/exame...	31,622	630.8	org.apache...	0x000...	
25	5,738	Active Thre	default task-95	BLOCKED	/cnet/front/exame...	38,526	743.0	org.apache...	0x000...	
26	5,917	Active Thre	default task-90	BLOCKED	/cnet/front/exame...	28,350	612.5	org.apache...	0x000...	
27	6,265	Active Thre	default task-74	BLOCKED	/cnet/front/exame...	37,662	743.6	org.apache...	0x000...	

Oracle DB의 응답을 기다리는 스레드



스레드 덤프 분석 방법 - DB 연결이 오래 걸릴 때



DB getConnection이 느릴 경우

Connection Pool 획득 요청 이후 Pool이 부족하여 대기하고 있는 상태

```
1894 "default task-248" #720 prio=5 os_prio=0 tid=0x00000000c411000 nid=0x79bb waiting on condition [0x00007f...
1895 java.lang.Thread.State: TIMED_WAITING (parking)
1896 at sun.misc.Unsafe.park(Native Method)
1897 - parking to wait for <0x000000006c2832210> (a java.util.concurrent.Semaphore$FairSync)
1898 at java.util.concurrent.locks.LockSupport.parkNanos(LockSupport.java:215)
1899 at java.util.concurrent.locks.AbstractQueuedSynchronizer.doAcquireSharedNanos(AbstractQueuedSynchronizer.java:409)
1900 at java.util.concurrent.locks.AbstractQueuedSynchronizer.tryAcquireSharedNanos(AbstractQueuedSynchronizer.java:489)
1901 at java.util.concurrent.Semaphore.tryAcquire(Semaphore.java:68)
1902 at org.jboss.jca.core.connectionmanager.pool.api.SemaphoreConcurrentLinkedDequeManagedConnectionPool.tryAcquire(SemaphoreConcurrentLinkedDequeManagedConnectionPool.java:632)
1903 at org.jboss.jca.core.connectionmanager.pool.AbstractPool.getSimpleConnection(AbstractPool.java:604)
1904 at org.jboss.jca.core.connectionmanager.pool.AbstractPool.getConnection(AbstractPool.java:604)
1905 at org.jboss.jca.core.connectionmanager.AbstractConnectionManager.getManagedConnection(AbstractConnectionManager.java:604)
1906 at org.jboss.jca.core.connectionmanager.tx.TxConnectionManagerImpl.getManagedConnection(TxConnectionManagerImpl.java:279)
1907 at org.jboss.jca.core.connectionmanager.AbstractConnectionManager.allocateConnection(AbstractConnectionManager.java:72)
1908 at org.jboss.jca.adapters.jdbc.WrapperDataSource.getConnection(WrapperDataSource.java:138)
1909 at org.jboss.as.connector.subsystems.datasources.WildFlyDataSource.getConnection(WildFlyDataSource.java:111)
1910 at org.springframework.jdbc.datasource.DataSourceUtils.doGetConnection(DataSourceUtils.java:111)
1911 at org.springframework.jdbc.datasource.DataSourceUtils.getConnection(DataSourceUtils.java:77)
1912 at org.mybatis.spring.transaction.SpringManagedTransaction.openConnection(SpringManagedTransaction.java:47)
1913 at org.mybatis.spring.transaction.SpringManagedTransaction.getConnection(SpringManagedTransaction.java:72)
1914 at org.apache.ibatis.executor.BaseExecutor.getConnection(BaseExecutor.java:279)
1915 at org.apache.ibatis.executor.SimpleExecutor.prepareStatement(SimpleExecutor.java:72)
1916 at org.apache.ibatis.executor.SimpleExecutor.doUpdate(SimpleExecutor.java:47)
1917 at org.apache.ibatis.executor.BaseExecutor.execute(BaseExecutor.java:103)
1918 at org.apache.ibatis.executor.BaseExecutor.<init>(BaseExecutor.java:75)
```

Q 스레드 덤프 분석기 > 2019-03-11 18:03:20 (26DFF023-4EB4-4654-8C17-06C06CDFAFE3)

#	Line#	Type	Name	State	URL	Durati...	CPU
1	536	Active Thread	taskExecutor-8	TIMED_WAITING		5,747	
2	963	Active Thread	default task-248	TIMED_WAITING	/bms/dct/getNotic...	3,797	
3	1,204	Active Thread	default task-246	TIMED_WAITING	/blg/message/mes...	6,297	
4	1,343	Active Thread	default task-244	TIMED_WAITING	/blg/message/mes...	7,399	
5	1,510	Active Thread	default task-240	RUNNABLE	/blg/message/mes...	11,773	
6	1,680	Active Thread	default task-236	TIMED_WAITING	/blg/message/mes...	2,496	
7	1,894	Active Thread	default task-229	TIMED_WAITING	/bms/dct/editrepo...	4,287	
8	2,049	Active Thread	default task-225	TIMED_WAITING	/blg/message/mes...	3,917	
9	2,671	Active Thread	default task-203	WAITING	/bms/dct/enf/Bms...	52	
10	2,804	Active Thread	default task-199	TIMED_WAITING	/blg/message/mes...	5,460	
11	3,198	Active Thread	default task-180	TIMED_WAITING	/blg/message/mes...	528	
12	3,397	Active Thread	default task-174	TIMED_WAITING	/bms/dct/editrepo...	4,912	

Record ID: 695

```
1892 - None
1893 - None
1894 "default task-229" #720 prio=5 os_prio=0 tid=0x00000000c411000 nid=0x79bb waiting on condition [0x00007f...
1895 java.lang.Thread.State: TIMED_WAITING (parking)
1896 at sun.misc.Unsafe.park(Native Method)
1897 - parking to wait for <0x000000006c2832210> (a java.util.concurrent.Semaphore$FairSync)
1898 at java.util.concurrent.locks.LockSupport.parkNanos(LockSupport.java:215)
1899 at java.util.concurrent.locks.AbstractQueuedSynchronizer.doAcquireSharedNanos(AbstractQueuedSynchronizer.java:409)
1900 at java.util.concurrent.locks.AbstractQueuedSynchronizer.tryAcquireSharedNanos(AbstractQueuedSynchronizer.java:489)
1901 at java.util.concurrent.Semaphore.tryAcquire(Semaphore.java:68)
1902 at org.jboss.jca.core.connectionmanager.pool.api.SemaphoreConcurrentLinkedDequeManagedConnectionPool.tryAcquire(SemaphoreConcurrentLinkedDequeManagedConnectionPool.java:632)
1903 at org.jboss.jca.core.connectionmanager.pool.AbstractPool.getSimpleConnection(AbstractPool.java:604)
1904 at org.jboss.jca.core.connectionmanager.pool.AbstractPool.getConnection(AbstractPool.java:604)
1905 at org.jboss.jca.core.connectionmanager.AbstractConnectionManager.getManagedConnection(AbstractConnectionManager.java:604)
1906 at org.jboss.jca.core.connectionmanager.tx.TxConnectionManagerImpl.getManagedConnection(TxConnectionManagerImpl.java:279)
1907 at org.jboss.jca.core.connectionmanager.AbstractConnectionManager.allocateConnection(AbstractConnectionManager.java:72)
1908 at org.jboss.jca.adapters.jdbc.WrapperDataSource.getConnection(WrapperDataSource.java:138)
1909 at org.jboss.as.connector.subsystems.datasources.WildFlyDataSource.getConnection(WildFlyDataSource.java:111)
1910 at org.springframework.jdbc.datasource.DataSourceUtils.doGetConnection(DataSourceUtils.java:111)
1911 at org.springframework.jdbc.datasource.DataSourceUtils.getConnection(DataSourceUtils.java:77)
1912 at org.mybatis.spring.transaction.SpringManagedTransaction.openConnection(SpringManagedTransaction.java:47)
1913 at org.mybatis.spring.transaction.SpringManagedTransaction.getConnection(SpringManagedTransaction.java:72)
1914 at org.apache.ibatis.executor.BaseExecutor.getConnection(BaseExecutor.java:279)
1915 at org.apache.ibatis.executor.SimpleExecutor.prepareStatement(SimpleExecutor.java:72)
1916 at org.apache.ibatis.executor.SimpleExecutor.doUpdate(SimpleExecutor.java:47)
1917 at org.apache.ibatis.executor.BaseExecutor.execute(BaseExecutor.java:103)
1918 at org.apache.ibatis.executor.BaseExecutor.<init>(BaseExecutor.java:75)
```

스레드 덤프 분석 주요 패턴



HTTP 호출이 느릴 때

```
2589 - None
2590
2591 "ajp-thread-pool-threads - 363" prio=10 tid=0x00007f977c250800 nid=0x3bbb runnable [0]
2592 java.lang.Thread.State: RUNNABLE
2593 at java.net.SocketInputStream.socketRead0(Native Method)
2594 at java.net.SocketInputStream.read(SocketInputStream.java:153)
2595 at java.net.SocketInputStream.read(SocketInputStream.java:122)
2596 at java.io.BufferedInputStream.fill(BufferedInputStream.java:235)
2597 at java.io.BufferedInputStream.read1(BufferedInputStream.java:275)
2598 at java.io.BufferedInputStream.read(BufferedInputStream.java:334)
2599 - locked <0x000000079998c960> (a java.io.BufferedInputStream)
2600 at sun.net.www.MeteredStream.read(MeteredStream.java:134)
2601 - locked <0x000000079998c8d0> (a sun.net.www.http.KeepAliveStream)
2602 at java.io.FilterInputStream.read(FilterInputStream.java:133)
2603 at sun.net.www.protocol.http.HttpURLConnection$HttpInputStream.read(HttpURLConnection.java:334)
2604 at sun.net.www.protocol.http.HttpURLConnection$HttpInputStream.read(HttpURLConnection.java:334)
2605 at com.nhncorp.keris.ebook.common.controller.FileDownloadURLView.renderMergedOutputModel(FileDownloadURLView.java:250)
2606 at org.springframework.web.servlet.view.AbstractView.render(AbstractView.java:250)
2607 at org.springframework.web.servlet.DispatcherServlet.render(DispatcherServlet.java:119)
```

Java의 HttpURLConnection가 호출한 URL의 Socket 응답을 기다리는 중

스레드 덤프 시점에 559초 가량 실행중

#	Line#	Type	Name	State	URL	Durati...	CPU T
1	1,862	Active Thread	ajp-thread-poo...	RUNNABLE	/securityFileDownl...	264,67...	
2	2,591	Active Thread	ajp-thread-poo...	RUNNABLE	/securityFileDownl...	559,79...	
3	17	Lock		locked			
4	32	Lock		locked			
5	50	Lock		Locked ownable ...		264,67...	
6	283	Lock		locked			
7	291	Lock		Locked ownable ...		559,79...	
8	300	Lock		locked			
9	308	Lock		Locked ownable ...			
10	1,870	Lock		locked			
11	1,872	Lock		locked			

```
2589 - None
2590
2591 "ajp-thread-pool-threads - 363" prio=10 tid=0x00007f977c250800 nid=0x3bbb runnable [0]
2592 java.lang.Thread.State: RUNNABLE
2593 at java.net.SocketInputStream.socketRead0(Native Method)
2594 at java.net.SocketInputStream.read(SocketInputStream.java:153)
2595 at java.net.SocketInputStream.read(SocketInputStream.java:122)
2596 at java.io.BufferedInputStream.fill(BufferedInputStream.java:235)
2597 at java.io.BufferedInputStream.read1(BufferedInputStream.java:275)
2598 at java.io.BufferedInputStream.read(BufferedInputStream.java:334)
2599 - locked <0x000000079998c960> (a java.io.BufferedInputStream)
2600 at sun.net.www.MeteredStream.read(MeteredStream.java:134)
2601 - locked <0x000000079998c8d0> (a sun.net.www.http.KeepAliveStream)
2602 at java.io.FilterInputStream.read(FilterInputStream.java:133)
2603 at sun.net.www.protocol.http.HttpURLConnection$HttpInputStream.read(HttpURLConnection.java:334)
2604 at sun.net.www.protocol.http.HttpURLConnection$HttpInputStream.read(HttpURLConnection.java:334)
2605 at com.nhncorp.keris.ebook.common.controller.FileDownloadURLView.renderMergedOutputModel(FileDownloadURLView.java:250)
2606 at org.springframework.web.servlet.view.AbstractView.render(AbstractView.java:250)
2607 at org.springframework.web.servlet.DispatcherServlet.render(DispatcherServlet.java:119)
2608 at org.springframework.web.servlet.DispatcherServlet.doDispatch(DispatcherServlet.java:404)
2609 at org.springframework.web.servlet.DispatcherServlet.doService(DispatcherServlet.java:437)
2610 at org.springframework.web.servlet.FrameworkServlet.processRequest(FrameworkServlet.java:948)
2611 at org.springframework.web.servlet.FrameworkServlet.doGet(FrameworkServlet.java:913)
2612 at javax.servlet.http.HttpServlet.service(HttpServlet.java:587)
```

Java의 HttpURLConnection은 Timeout / Pooling을 지원하지 않아 HttpClient로 변경해야 함

스레드 덤프 분석 주요 패턴



HTTP 호출이 느릴 때

```

42873
42874 "http-10.129.2.144:8080-257" daemon prio=10 tid=0x00007f38a01f8800 nid=0x11dae runnable [0x00007f37d2a2f000]
42875 java.lang.Thread.State: RUNNABLE
42876   at java.net.SocketInputStream.socketRead0(Native Method)
42877   at java.net.SocketInputStream.read(SocketInputStream.java:153)
42878   at java.net.SocketInputStream.read(SocketInputStream.java:122)
42879   at sun.security.ssl.InputRecord.readFully(InputRecord.java:442)
42880   at sun.security.ssl.InputRecord.read(InputRecord.java:480)
42881   at sun.security.ssl.SSLSocketImpl.readRecord(SSLSocketImpl.java:944)
42882   - locked <0x00000007ada7a698> (a java.lang.Object)
42883   at sun.security.ssl.SSLSocketImpl.readDataRecord(SSLSocketImpl.java:901)
42884   at sun.security.ssl.AppInputStream.read(AppInputStream.java:102)
42885   - locked <0x00000007ada8be90> (a sun.security.ssl.AppInputStream)
42886   at org.apache.http.impl.io.SessionInputBufferImpl.streamRead(SessionInputBufferImpl.java:136)
42887   at org.apache.http.impl.io.SessionInputBufferImpl.fillBuffer(SessionInputBufferImpl.java:152)
42888   at org.apache.http.impl.io.SessionInputBufferImpl.readLine(SessionInputBufferImpl.java:270)
  
```

Http Client가 호출한 URL의 Socket 응답을 기다리는 중

스레드 덤프 시점에 650초 가량 실행중

#	Line#	Type	Name	State	Package	Class	Method	Native	Address
1	42,874	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	socketRead0	0x00000007ada7a698	0x00000007ada7a698
2	54,758	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
3	43,443	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
4	38,354	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
5	37,328	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
6	36,358	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
7	41,684	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
8	60,198	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
9	60,058	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
10	50,316	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
11	48,366	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
12	44,596	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
13	47,306	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
14	42,524	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
15	43,723	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
16	49,616	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
17	49,126	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
18	52,966	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
19	57,317	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
20	56,882	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
21	44,716	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
22	42,394	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698
23	53,972	Active Thread	http-10.129.2.144:8080-257	RUNNABLE	java.net	SocketInputStream	read	0x00000007ada7a698	0x00000007ada7a698

653,655
652,996

대부분의 스레드는 /common/office365/getMailInfo.ajax 호출이 응답이 없는 상황

스레드 덤프 분석 주요 패턴



Logging 처리가 느릴 때

```
2773 java.lang.Thread.State: RUNNABLE
2774 at java.security.AccessController.doPrivileged(Native Method)
2775 at org.jboss.logmanager.ClassLoaderLogContextSelector.getLogContext(ClassLoaderLogContextSelector.java:137)
2776 at org.jboss.logmanager.ThreadLocalLogContextSelector.getLogContext(ThreadLocalLogContextSelector.java:55)
2777 at org.jboss.as.logging.logmanager.WildFlyLogContextSelectorImpl.getLogContext(WildFlyLogContextSelectorImpl.java:59)
2778 at org.jboss.logmanager.LogContext.getLogContext(LogContext.java:295)
2779 at org.jboss.as.logging.stdio.LogContextStdioContextSelector.getLogContext(LogContextStdioContextSelector.java:49)
2780 at org.jboss.stdio.StdioContext$1.getDelegate(StdioContext.java:148)
2781 at org.jboss.stdio.StdioContext$DelegatingPrintStream.write(StdioContext.java:264)
2782 at sun.nio.cs.StreamEncoder.writeBytes(StreamEncoder.java:221)
2783 at sun.nio.cs.StreamEncoder.implFlushBuffer(StreamEncoder.java:291)
2784 at sun.nio.cs.StreamEncoder.implFlush(StreamEncoder.java:295)
2785 at sun.nio.cs.StreamEncoder.flush(StreamEncoder.java:141)
2786 - locked <0x00000006cf0ca860> (a java.io.OutputStreamWriter)
2787 at java.io.OutputStreamWriter.flush(OutputStreamWriter.java:229)
2788 at org.apache.log4j.helpers.QuietWriter.flush(QuietWriter.java:66)
2789 at org.apache.log4j.WriterAppender.subAppend(WriterAppender.java:377)
2790 at org.apache.log4j.WriterAppender.append(WriterAppender.java:176)
2791 at org.apache.log4j.AppenderSkeleton.doAppend(AppenderSkeleton.java:286)
2792 - locked <0x00000006cf0ca580> (a org.apache.log4j.ConsoleAppender)
2793 at org.apache.log4j.helpers.AppenderAttachableImpl.appendLoopOnAppenders(AppenderAttachableImpl.java:67)
2794 at org.apache.log4j.Category.callAppenders(Category.java:218)
```

Log4j에서 Log를 Write할 때 느림

#	Lin.	Type	Name	State	URL	Durati...	CPU Ti...	Class	At	Addr...
1	650	Active Thre	default task-246	RUNNABLE	/cnet/front/exame...	14,403	352.9	java.net.So...	0x000...	
2	924	Active Thre	default task-238	BLOCKED	/cnet/front/exame...	33,986	693.4	org.apache...	0x000...	
3	1,061	Active Thre	default task-236	BLOCKED	/cnet/front/exame...	33,058	628.9	org.apache...	0x000...	
4	1,181	Active Thre	default task-235	BLOCKED	/cnet/front/exame...	39,877	745.3	org.apache...	0x000...	
5	1,588	Active Thre	default task-215	BLOCKED	/cnet/front/exame...	38,246	745.2	org.apache...	0x000...	
6	1,737	Active Thre	default task-212	BLOCKED	/cnet/front/exame...	32,150	637.7	org.apache...	0x000...	
7	1,983	Active Thre	default task-204	BLOCKED	/cnet/front/exame...	30,869	627.5	org.apache...	0x000...	
8	2,117	Active Thre	default task-202	BLOCKED	/cnet/front/exame...	38,711	757.2	org.apache...	0x000...	
9	2,314	Active Thre	default task-196	BLOCKED	/cnet/front/exame...	30,347	608.5	org.apache...	0x000...	
10	2,498	Active Thre	default task-193	BLOCKED	/cnet/front/exame...	38,861	757.6	org.apache...	0x000...	
11	2,620	Active Thre	default task-191	BLOCKED	/cnet/front/exame...	32,901	655.2	org.apache...	0x000...	
12	2,772	Active Thre	default task-188	RUNNABLE	/cnet/front/exame...	34,560	673.6	java.securi...	0x000...	
13	3,143	Active Thre	default task-176	BLOCKED	/cnet/front/exame...	31,438	613.1	org.apache...	0x000...	
14	3,281	Active Thre	default task-174	BLOCKED	/cnet/front/exame...	25,674	559.1	org.apache...	0x000...	
15	3,419	Active Thre	default task-172	RUNNABLE	/cnet/front/exame...	40,398	766.5	java.net.So...	0x000...	
16	3,633	Active Thre	default task-168	BLOCKED	/cnet/front/exame...	26,471	502.3	org.apache...	0x000...	
17	4,007	Active Thre	default task-151	BLOCKED	/cnet/front/exame...	29,606	589.9	org.apache...	0x000...	
18	4,144	Active Thre	default task-149	BLOCKED	/cnet/front/exame...	26,854	555.2	org.apache...	0x000...	
19	4,278	Active Thre	default task-147	BLOCKED	/cnet/front/exame...	27,212	564.3	org.apache...	0x000...	
20	4,400	Active Thre	default task-146	BLOCKED	/cnet/front/memb...	1,145	11.5	org.apache...	0x000...	
21	4,577	Active Thre	default task-143	BLOCKED	/cnet/front/exame...	37,405	694.4	org.apache...	0x000...	
22	5,179	Active Thre	default task-110	BLOCKED	/cnet/front/exame...	28,692	618.0	org.apache...	0x000...	
23	5,302	Active Thre	default task-109	BLOCKED	/cnet/front/exame...	12,069	282.6	org.apache...	0x000...	
24	5,589	Active Thre	default task-98	BLOCKED	/cnet/front/exame...	31,622	630.8	org.apache...	0x000...	

```
2773 java.lang.Thread.State: RUNNABLE
2774 at java.security.AccessController.doPrivileged(Native Method)
2775 at org.jboss.logmanager.ClassLoaderLogContextSelector.getLogContext(ClassLoaderLogContextSelector.java:137)
2776 at org.jboss.logmanager.ThreadLocalLogContextSelector.getLogContext(ThreadLocalLogContextSelector.java:55)
2777 at org.jboss.as.logging.logmanager.WildFlyLogContextSelectorImpl.getLogContext(WildFlyLogContextSelectorImpl.java:59)
2778 at org.jboss.logmanager.LogContext.getLogContext(LogContext.java:295)
2779 at org.jboss.as.logging.stdio.LogContextStdioContextSelector.getLogContext(LogContextStdioContextSelector.java:49)
2780 at org.jboss.stdio.StdioContext$1.getDelegate(StdioContext.java:148)
2781 at org.jboss.stdio.StdioContext$DelegatingPrintStream.write(StdioContext.java:264)
2782 at sun.nio.cs.StreamEncoder.writeBytes(StreamEncoder.java:221)
2783 at sun.nio.cs.StreamEncoder.implFlushBuffer(StreamEncoder.java:291)
2784 at sun.nio.cs.StreamEncoder.implFlush(StreamEncoder.java:295)
2785 at sun.nio.cs.StreamEncoder.flush(StreamEncoder.java:141)
2786 - locked <0x00000006cf0ca860> (a java.io.OutputStreamWriter)
2787 at java.io.OutputStreamWriter.flush(OutputStreamWriter.java:229)
2788 at org.apache.log4j.helpers.QuietWriter.flush(QuietWriter.java:66)
2789 at org.apache.log4j.WriterAppender.subAppend(WriterAppender.java:377)
2790 at org.apache.log4j.WriterAppender.append(WriterAppender.java:176)
2791 at org.apache.log4j.AppenderSkeleton.doAppend(AppenderSkeleton.java:286)
2792 - locked <0x00000006cf0ca580> (a org.apache.log4j.ConsoleAppender)
2793 at org.apache.log4j.helpers.AppenderAttachableImpl.appendLoopOnAppenders(AppenderAttachableImpl.java:67)
2794 at org.apache.log4j.Category.callAppenders(Category.java:218)
2795 at org.apache.log4j.Category.log(Category.java:1168)
2796 at org.apache.log4j.Category.log(Category.java:1177)
2797 at org.apache.commons.logging.impl.Log4JLogger.debug(Log4JLogger.java:177)
2798 at org.springframework.jdbc.datasource.DataSourceTransactionManager.doBegin(DataSourceTransactionManager.java:221)
2799 at org.springframework.transaction.support.AbstractPlatformTransactionManager.getTransaction(AbstractPlatformTransactionManager.java:172)
2800 at org.springframework.transaction.interceptor.TransactionAspectSupport.createTransactionIfNecessary(TransactionAspectSupport.java:41)
2801 at org.springframework.transaction.interceptor.TransactionInterceptor.invoke(TransactionInterceptor.java:25)
2802 at org.springframework.transaction.interceptor.TransactionInterceptor.invoke(TransactionInterceptor.java:94)
2803 at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:172)
2804 at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:172)
2805 at org.springframework.aop.interceptor.ExposeInvocationInterceptor.invoke(ExposeInvocationInterceptor.java:91)
2806 at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:172)
2807 at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:172)
2808 at org.springframework.aop.framework.CglibAopProxy$CglibMethodInterceptor.intercept(CglibAopProxy.java:633)
2809 at egovframework.cnet.commonbiz.service.CommonBizService$EnhancerBySpringGLIB$$68f101d.joblink(generated)
2810 at egovframework.cnet.front.examen.controller.AropolisController.addSelfTotalJobLink(AropolisController.java:140)
2811 at egovframework.cnet.front.examen.controller.AropolisController.addSelfTotalReportPopup(AropolisController.java:1173)
2812 at sun.reflect.GeneratedMethodAccessor524.invoke(Unknown Source)
2813 at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
2814 at java.lang.reflect.Method.invoke(Method.java:498)
2815 at org.springframework.web.servlet.mvc.annotation.AnnotationMethodHandlerAdapter.invokeHandlerMethod(AnnotationMethodHandlerAdapter.java:176)
2816 at org.springframework.web.servlet.mvc.annotation.AnnotationMethodHandlerAdapter.invokeHandlerMethod(AnnotationMethodHandlerAdapter.java:176)
2817
```

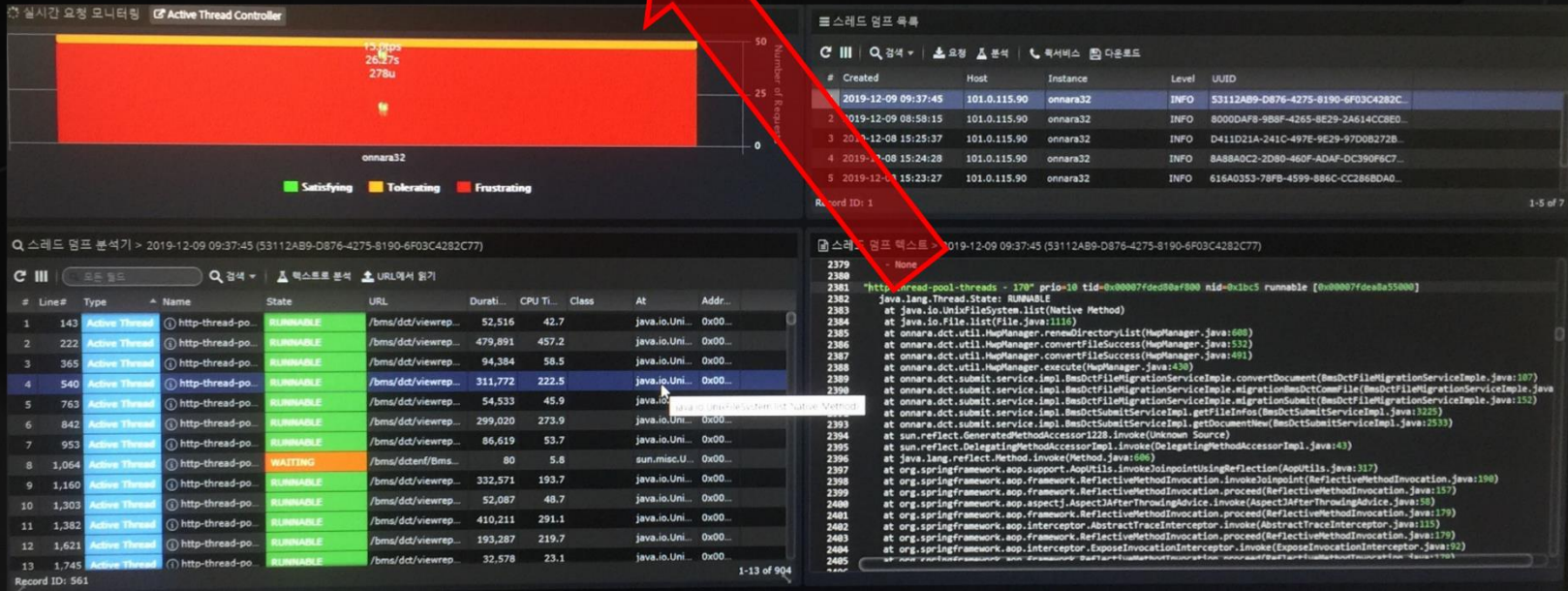

스레드 덤프 분석 주요 패턴



파일 I/O가 느릴 때

파일 List를 가져오는 함수에서 응답이 없음

```
2379 - None
2380
2381 "http-thread-pool-threads - 170" prio=10 tid=0x00007f0ed00ef800 nid=0x1bc5 runnable [0x00007f0ed0e8a55000]
2382   java.lang.Thread.State: RUNNABLE
2383   at java.io.UnixFileSystem.list(Native Method)
2384   at java.io.File.list(File.java:1116)
2385   at .....util.HwpManager.renewDirectoryList(HwpManager.java:608)
2386   at .....util.HwpManager.convertFileSuccess(HwpManager.java:532)
```



스레드 덤프 분석기 > 2019-12-09 09:37:45 (53112AB9-D876-4275-8190-6F03C4282C77)

#	Line#	Type	Name	State	URL	Durati...	CPU Ti...	Class	At	Addr...
1	143	Active Thread	http-thread-po...	RUNNABLE	/bms/dct/viewrep...	52,516	42.7	java.io.Uni...	0x00...	
2	222	Active Thread	http-thread-po...	RUNNABLE	/bms/dct/viewrep...	479,891	457.2	java.io.Uni...	0x00...	
3	365	Active Thread	http-thread-po...	RUNNABLE	/bms/dct/viewrep...	94,384	58.5	java.io.Uni...	0x00...	
4	540	Active Thread	http-thread-po...	RUNNABLE	/bms/dct/viewrep...	311,772	222.5	java.io.Uni...	0x00...	
5	763	Active Thread	http-thread-po...	RUNNABLE	/bms/dct/viewrep...	54,533	45.9	java.io.Uni...	0x00...	
6	842	Active Thread	http-thread-po...	RUNNABLE	/bms/dct/viewrep...	299,020	273.9	java.io.Uni...	0x00...	
7	953	Active Thread	http-thread-po...	RUNNABLE	/bms/dct/viewrep...	86,619	53.7	java.io.Uni...	0x00...	
8	1,064	Active Thread	http-thread-po...	WAITING	/bms/dcten/Bms...	80	5.8	sun.misc.U...	0x00...	
9	1,160	Active Thread	http-thread-po...	RUNNABLE	/bms/dct/viewrep...	332,571	193.7	java.io.Uni...	0x00...	
10	1,303	Active Thread	http-thread-po...	RUNNABLE	/bms/dct/viewrep...	52,087	48.7	java.io.Uni...	0x00...	
11	1,382	Active Thread	http-thread-po...	RUNNABLE	/bms/dct/viewrep...	410,211	291.1	java.io.Uni...	0x00...	
12	1,621	Active Thread	http-thread-po...	RUNNABLE	/bms/dct/viewrep...	193,287	219.7	java.io.Uni...	0x00...	
13	1,745	Active Thread	http-thread-po...	RUNNABLE	/bms/dct/viewrep...	32,578	23.1	java.io.Uni...	0x00...	

Record ID: 961

스레드 덤프 텍스트 > 2019-12-09 09:37:45 (53112AB9-D876-4275-8190-6F03C4282C77)

```
2379 - None
2380
2381 "http-thread-pool-threads - 170" prio=10 tid=0x00007f0ed00ef800 nid=0x1bc5 runnable [0x00007f0ed0e8a55000]
2382   java.lang.Thread.State: RUNNABLE
2383   at java.io.UnixFileSystem.list(Native Method)
2384   at java.io.File.list(File.java:1116)
2385   at .....util.HwpManager.renewDirectoryList(HwpManager.java:608)
2386   at .....util.HwpManager.convertFileSuccess(HwpManager.java:532)
2387   at .....util.HwpManager.convertFileSuccess(HwpManager.java:491)
2388   at .....util.HwpManager.execute(HwpManager.java:430)
2389   at .....dct.submit.service.impl.BmsDctSubmitServiceImpl.migrationBmsDctCommFile(BmsDctFileMigrationServiceImpl.java:187)
2390   at .....dct.submit.service.impl.BmsDctSubmitServiceImpl.migrationBmsDctCommFile(BmsDctFileMigrationServiceImpl.java:152)
2391   at .....dct.submit.service.impl.BmsDctSubmitServiceImpl.migrationBmsDctCommFile(BmsDctFileMigrationServiceImpl.java:152)
2392   at .....dct.submit.service.impl.BmsDctSubmitServiceImpl.getFileInfos(BmsDctSubmitServiceImpl.java:1225)
2393   at .....dct.submit.service.impl.BmsDctSubmitServiceImpl.getDocumentThe(BmsDctSubmitServiceImpl.java:2333)
2394   at sun.reflect.GeneratedMethodAccessor1228.invoke(Unknown Source)
2395   at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
2396   at java.lang.reflect.Method.invoke(Method.java:606)
2397   at org.springframework.aop.support.AopUtils.invokeJoinpointUsingReflection(AopUtils.java:317)
2398   at org.springframework.aop.framework.ReflectiveMethodInvocation.invokeJoinpoint(ReflectiveMethodInvocation.java:190)
2399   at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:157)
2400   at org.springframework.aop.aspectj.AspectJAfterThrowingAdvice.invoke(AspectJAfterThrowingAdvice.java:53)
2401   at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:179)
2402   at org.springframework.aop.interceptor.AbstractTraceInterceptor.invoke(AbstractTraceInterceptor.java:115)
2403   at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:179)
2404   at org.springframework.aop.interceptor.ExposeInvocationInterceptor.invoke(ExposeInvocationInterceptor.java:92)
2405   at org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:179)
```

스레드 덤프 분석 주요 패턴



Lock이 걸릴 때

```
5506 at org.apache.ibatis.executor.caching.executor.update(CachingExecutor.java:76)
5507 at org.apache.ibatis.session.defaults.DefaultSqlSession.update(DefaultSqlSession.java:198)
5508 at org.apache.ibatis.session.defaults.DefaultSqlSession.insert(DefaultSqlSession.java:185)
5509 at sun.reflect.GeneratedMethodAccessor174.invoke(Unknown Source)
5510 at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
5511 at java.lang.reflect.Method.invoke(Method.java:498)
5512 at org.mybatis.spring.SqlSessionTemplate$SqlSessionInterceptor.invoke(SqlSessionTemplate.java:433)
5513 at com.sun.proxy.$Proxy61.insert(Unknown Source)
5514 at org.mybatis.spring.SqlSessionTemplate.insert(SqlSessionTemplate.java:278)
5515 at com.daekyo.ligp.web.dao.mappers.DefaultMapper.insert(DefaultMapper.java:46)
5516 at com.daekyo.ligp.web.service.nontran.impl.DBLogginServiceImpl.insertRequestLog(DBLogginServiceImpl.java:45)
5517 | locked <0x0000000705f28b88> (a com.daekyo.ligp.web.service.nontran.impl.DBLogginServiceImpl)
5518 at com.daekyo.ligp.web.interceptor.DefaultInterceptor.insertDbLog(DefaultInterceptor.java:124)
5519 at com.daekyo.ligp.web.interceptor.DefaultInterceptor.preHandle(DefaultInterceptor.java:46)
5520 at org.springframework.web.servlet.HandlerExecutionChain.applyPreHandle(HandlerExecutionChain.java:133)
```

모두 Lock 0x0000..705f28b88 을 기다리고 있음

Q 스레드 덤프 분석기

모든 필드 검색 텍스트로 분석 URL에서 읽기

#	Line#	Type	Name	State	URL	Duration	CPU Time(ms Class)	At	Address
1	1,186	Active Thread	default task-250	BLOCKED	/home/home.do	3,075	0.0	com.daekyo.l	0x00000
2	1,257	Active Thread	default task-249	BLOCKED	/home/home.do	5,375		com.daekyo.l	0x00000
3	1,328	Active Thread	default task-248	BLOCKED	/home/home.do	6,198		com.daekyo.l	0x00000
4	1,399	Active Thread	default task-247	BLOCKED	/home/home.do	6,370		com.daekyo.l	0x00000
5	1,470	Active Thread	default task-246	BLOCKED	/home/home.do	4,965		com.daekyo.l	0x00000
6	1,612	Active Thread	default task-244	BLOCKED	/home/home.do	4,403		com.daekyo.l	0x00000
7	1,683	Active Thread	default task-243	BLOCKED	/home/home.do	3,666		com.daekyo.l	0x00000
8	1,754	Active Thread	default task-242	BLOCKED	/home/home.do	3,442	0.0	com.daekyo.l	0x00000
9	1,967	Active Thread	default task-239	BLOCKED	/home/home.do	4,292	0.0	com.daekyo.l	0x00000
10	2,038	Active Thread	default task-238	BLOCKED	/home/home.do	6,063	0.0	com.daekyo.l	0x00000
11	2,180	Active Thread	default task-236	BLOCKED	/home/home.do	5,534		com.daekyo.l	0x00000
12	2,322	Active Thread	default task-234	BLOCKED	/home/home.do	3,888		com.daekyo.l	0x00000
13	2,497	Active Thread	default task-232	BLOCKED	/home/home.do	2,162	1.7	com.daekyo.l	0x00000

Record ID: 614 1-13 of 1,038

waiting to lock 0x1234

locked 0x1234

DBLogginServiceImpl 코드에서 Synchronized 구분 사용

```
5498 at org.apache.ibatis.type.BaseTypeHandler.setParameters(BaseTypeHandler.java:74)
5499 at org.apache.ibatis.type.BaseTypeHandler.setParameter(BaseTypeHandler.java:87)
5500 at org.apache.ibatis.executor.statement.PreparedStatementHandler.insert(PreparedStatementHandler.java:93)
5501 at org.apache.ibatis.executor.statement.PreparedBatchedInsertHandler.insert(PreparedBatchedInsertHandler.java:14)
5502 at org.apache.ibatis.executor.SimpleExecutor.prepareStatement(SimpleExecutor.java:88)
5503 at org.apache.ibatis.executor.SimpleExecutor.doUpdate(SimpleExecutor.java:49)
5504 at org.apache.ibatis.executor.BaseExecutor.update(BaseExecutor.java:117)
5505 at org.apache.ibatis.executor.CachingExecutor.update(CachingExecutor.java:76)
5506 at org.apache.ibatis.session.defaults.DefaultSqlSession.update(DefaultSqlSession.java:198)
5507 at org.apache.ibatis.session.defaults.DefaultSqlSession.insert(DefaultSqlSession.java:185)
5508 at sun.reflect.GeneratedMethodAccessor174.invoke(Unknown Source)
5509 at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
5510 at java.lang.reflect.Method.invoke(Method.java:498)
5511 at org.mybatis.spring.SqlSessionTemplate$SqlSessionInterceptor.invoke(SqlSessionTemplate.java:433)
5512 at com.sun.proxy.$Proxy61.insert(Unknown Source)
5513 at org.mybatis.spring.SqlSessionTemplate.insert(SqlSessionTemplate.java:278)
5514 at com.daekyo.ligp.web.dao.mappers.DefaultMapper.insert(DefaultMapper.java:46)
5515 at com.daekyo.ligp.web.service.nontran.impl.DBLogginServiceImpl.insertRequestLog(DBLogginServiceImpl.java:45)
5516 at com.daekyo.ligp.web.interceptor.DefaultInterceptor.insertDbLog(DefaultInterceptor.java:124)
5517 | locked <0x0000000705f28b88> (a com.daekyo.ligp.web.service.nontran.impl.DBLogginServiceImpl)
5518 at org.springframework.web.servlet.HandlerExecutionChain.applyPreHandle(HandlerExecutionChain.java:133)
5519 at org.springframework.web.servlet.DispatcherServlet.doDispatch(DispatcherServlet.java:962)
5520 at org.springframework.web.servlet.DispatcherServlet.doService(DispatcherServlet.java:901)
5521 at org.springframework.web.servlet.FrameworkServlet.processRequest(FrameworkServlet.java:970)
5522 at org.springframework.web.servlet.FrameworkServlet.doPost(FrameworkServlet.java:938)
5523 at javax.servlet.http.HttpServlet.service(HttpServlet.java:658)
5524 at javax.servlet.http.HttpServlet.service(HttpServlet.java:760)
```

Thread Dump의 Blocked의 의미


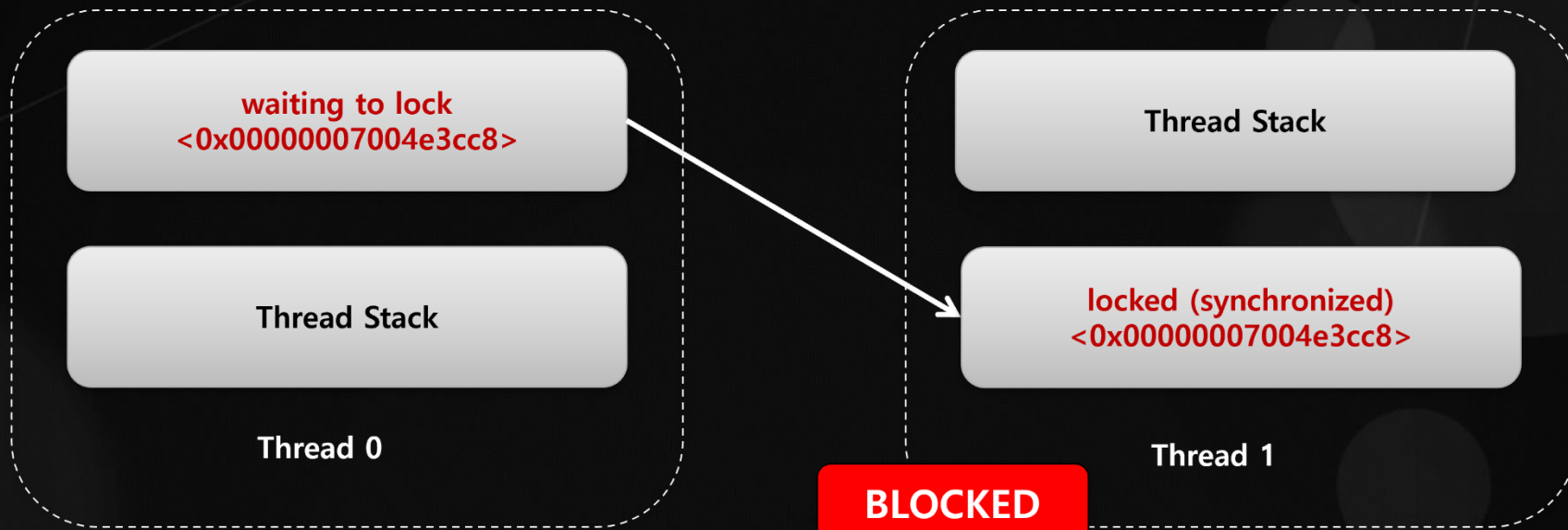
- 여러 스레드에서 같은 변수나 메소드를 변경할 경우
- synchronized로 다른 스레드의 처리가 끝날 때 까지 제어가 넘어가지 않도록 보호

```

// 특정한 객체에 lock을 걸고자 할 때
synchronized(객체의 참조변수){
    // ...
}

// 메서드에 lock을 걸고자할 때
public synchronized void methodName(){
    // ...
}

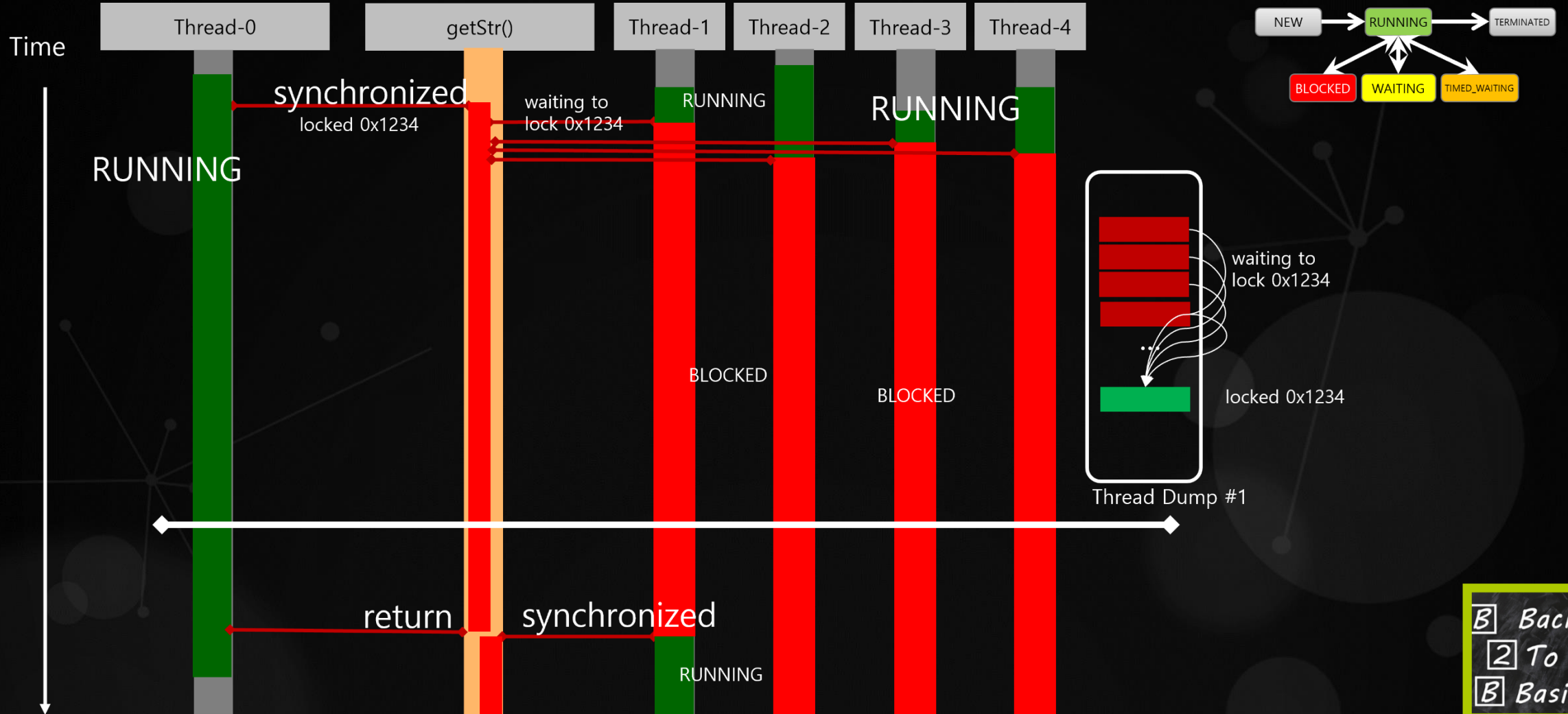
```

Back
To
Basics

개념과 배경지식

Thread BLOCKED 상태가 길어지면 발생하는 상황



B Back
2 To
B Basics

개념과 배경지식

스레드 덤프 분석 주요 패턴의 주요 해결방법





openmaru