

# 애플리케이션 성능과 장애 대응 데모

- 목적

- 어플리케이션을 실시간 모니터링 데모를 통하여 장애 발생 시 원인을 정확히 파악하기 위함입니다.

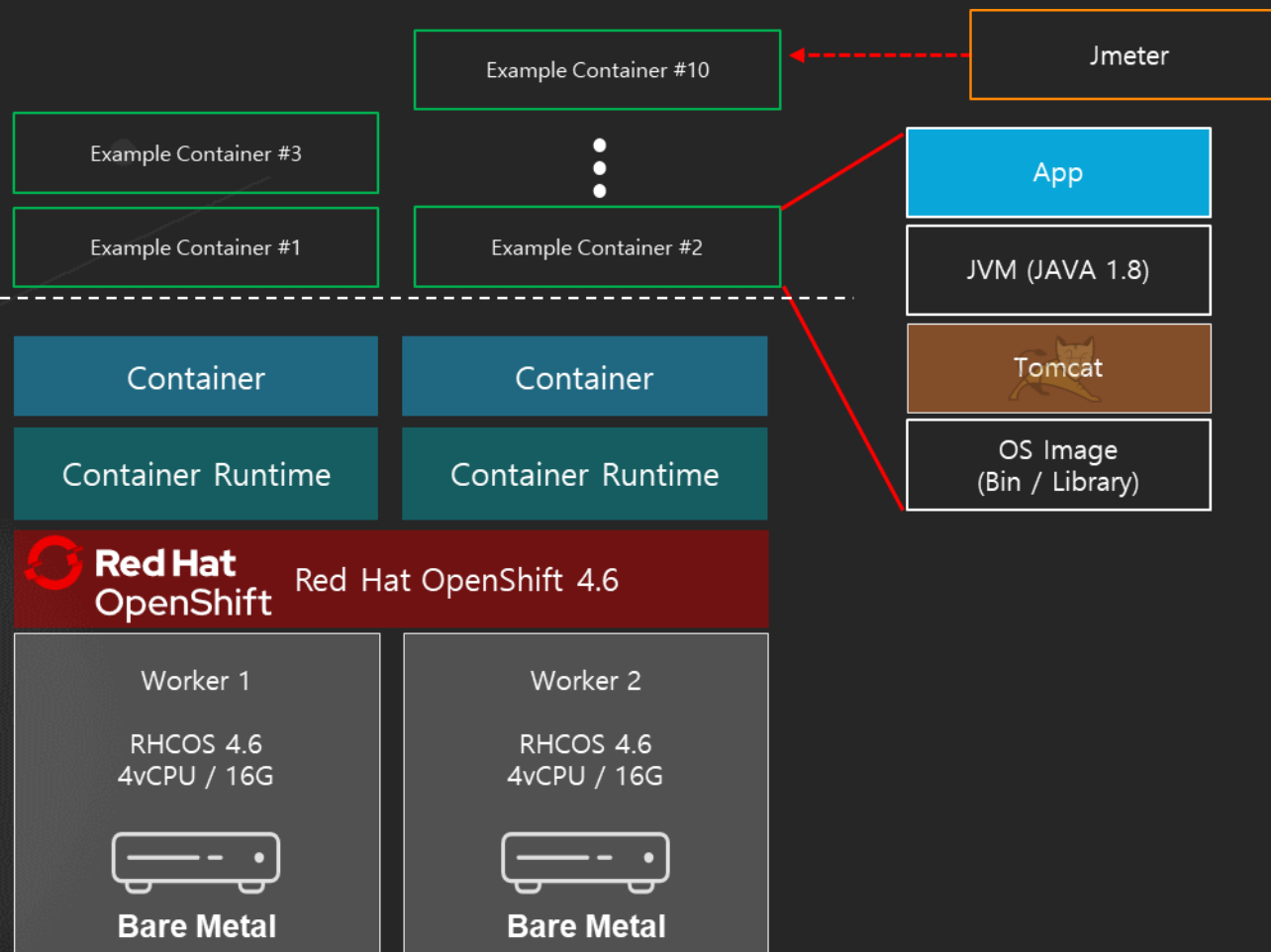
- 내용

- 장애가 시 OPENMARU APM에서 장애 발생 원인을 정확히 확인 할 수 있습니다.
- CPU에 부하를 주는 샘플 어플리케이션을 배포한 후 JMeter 로 부하를 줘서 APM에서 헬스체크, 이벤트 목록에서 장애 내역을 확인 할 수 있습니다.



어플리케이션 장애 타입이 따로 있는건가요?  
그런걸 APM 통해서 알면 어떤 대응을 할 수 있나요?

# Container 환경 테스트 구성도




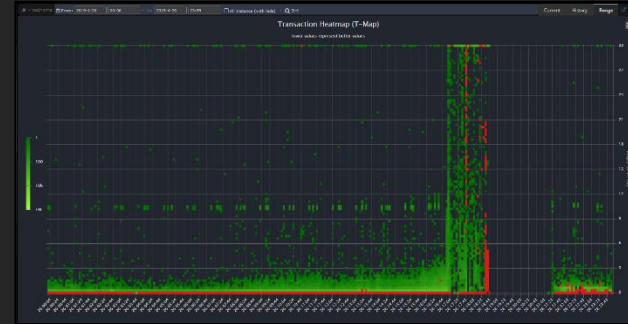
PaaS 운영

# 애플리케이션 장애의 대표적인 패턴

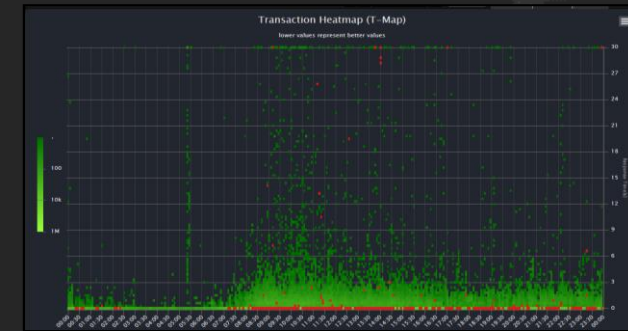
# 애플리케이션 장애의 대표적인 패턴



Full GC



Server Hang



Runtime Exception



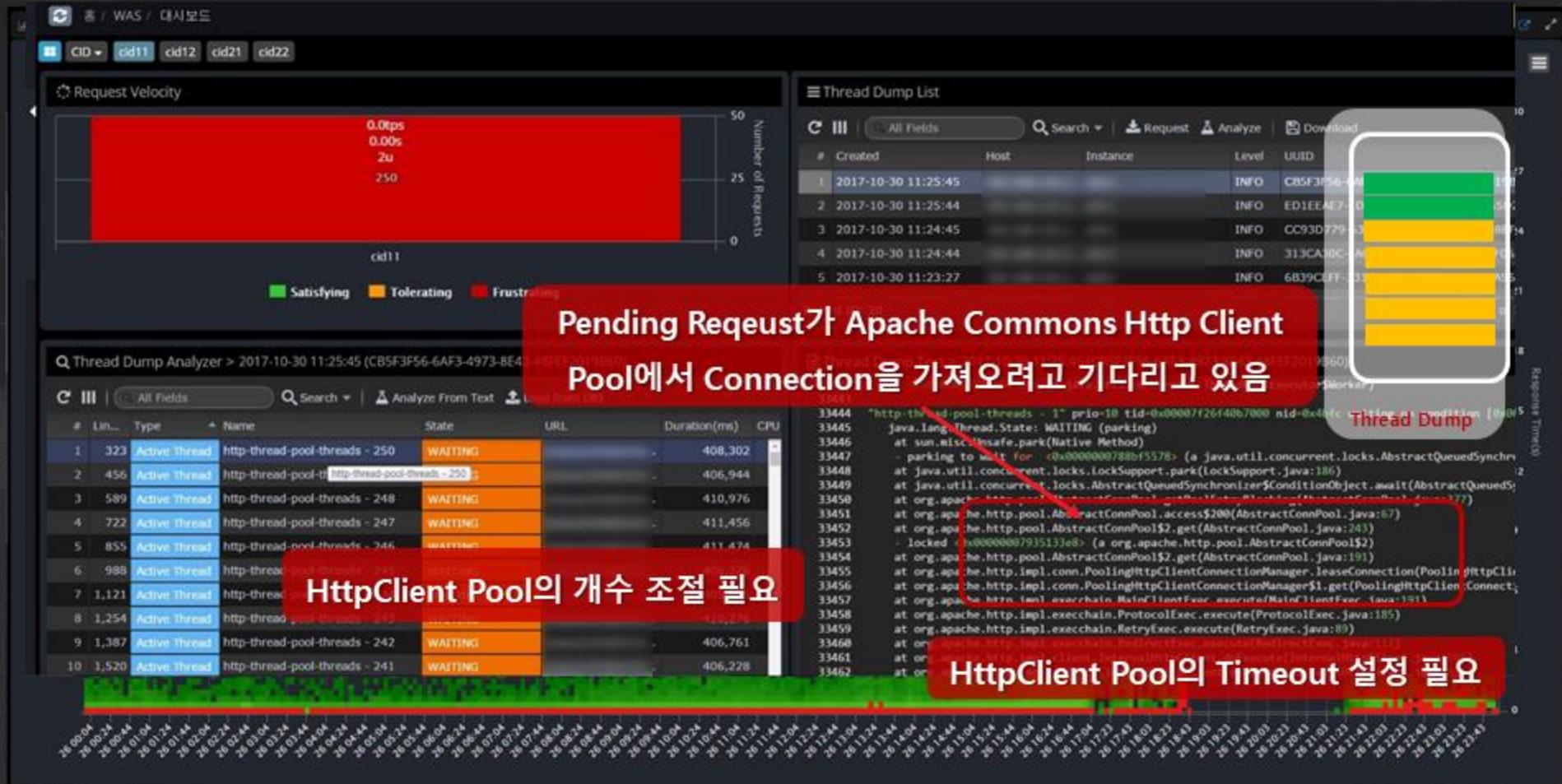
Agent Type	Server IP	Client IP	Instance ID	URL	Status	Duration(ms)	SQL Time(ms)	Fetch Gab	Fetch Count	External Time	CPU Time(ms)	Start Time
WAS				/member/auth	500	178,684	93	178,543	92,982	0	3,203.13	2017-12-11 18:30:47.754
WAS				/member/auth	200	146,325	9,265	0	2	0	31.25	2017-12-11 18:31:19.925
WAS				/member/auth	200	143,590	0	0	2	0	31.25	2017-12-11 18:31:22.660
WAS				/log/tracking	200	134,481	0	0	0	0	15.63	2017-12-11 18:31:31.785
WAS				/log/tracking	200	129,779	0	0	0	0	46.88	2017-12-11 18:31:36.503
WAS				/member/auth	200	127,184	4,093	0	1	0	46.88	2017-12-11 18:31:39.066
WAS				/member/auth	200	127,184	4,093	0	1	0	31.25	2017-12-11 18:31:41.691
WAS				/member/firstAct	200	119,107	0	0	1	0	78.13	2017-12-11 18:31:47.128

**사용자 인증시 데이터베이스 Fetch를 92,982건 호출함**

Transaction Detail | Trace | StackTrace

Name	Value	Name	Value
Request URL	POST /member/auth <a href="#">View URL</a>	Params	
Request Host	o.kr <a href="#">View Page</a>	Status Code	500
Client IP	User Location	User Agent	Variables/2.0.7 (iPhone; iOS 10.3.2; Scale/3.00)
Start Time	2017-12-11 09:30:47.754	End Time	2017-12-11 09:33:46.438
Duration (ms)	178,684	CPU Time (ms)	3,203.13
JDBC Time (ms)	93	Latency (ms)	0
Thread Name	http-bio-80-exec-67	Thread ID	1819
IP		Instance ID	
Agent Type	WAS	Transaction ID	16044e99575e-199e9ec195f9aee7866
Error Message			

# Server Hang



# Runtime Exception

Agent Type	Server IP	Client IP	Instance ID	URL	Status	Duration(ms)	SQL Time(ms)	Fetch Gap	Fetch Count	External Time	CPU Time(ms)	Start Time
WAS					500	23,749	0	0	0	0	13.64	2018-01-24 10:21:22.731
WAS					500	1,754	405	5	57	0	194.00	2018-01-24 11:18:58.449
WAS				rpt.do	500	1,327	258	2	44	0	57.52	2018-01-24 10:54:35.703
WAS				rpt.do	500	1,257	55	7	45	0	105.93	2018-01-24 09:21:12.665
WAS				rpt.do	500	1,108	305	4	47	0	55.80	2018-01-24 10:37:26.892
WAS				rpt.do	500	1,063	259	4	44	0	64.33	2018-01-24 08:50:43.556
WAS					500	1,058	1,037	0	40	0	35.89	2018-01-24 08:33:50.325
WAS				rpt.do	500	964	191	4	41	0	49.24	2018-01-24 10:32:51.798
WAS				rpt.do	500	952	339	1	38	0	86.03	2018-01-24 07:45:50.215
WAS				rpt.do	500	943	155	2	47	0	49.16	2018-01-24 10:37:06.733

XXXToDoCntPortlet.jsp의 102번째 라인에서 오류 발생

**Transaction Detail** | Trace | StackTrace

Client IP: [redacted] User Location: [redacted]

Start Time: 2018-01-24 08:33:50.325 | End Time: 2018-01-24 08:33:51.383

Duration (ms): 1,058 | CPU Time (ms): 35.89

JDBC Time (ms): 1,037 | Latency (ms): 0

Thread Name: http-thread-pool-threads - 104 | Thread ID: 399

IP: [redacted] | Instance ID: instance22

Agent Type: WAS | Transaction ID: 161255b1e23-18490e92c7c7a9d1a1

Error Message

```
JBK004838: An exception occurred processing JSP page /WEB-INF/jsp/com/E...llet.jsp at line 102
99:     < %
100:         int pageCount = 0;
101:         for ( int i = 0; i < itemVO.length; i++ ) {
102:             if("S".equals(itemVO[i].getItem2()) && "S".equals(itemSysVO[1].getItem2()) && "000".equals(itemVO[i].getConfigItemid())) {
103:                 pageCount++; height +=20;X;
104:             < /%
105:             < span>< a href="#" onclick="parent.load_inb('MSRP_ONLINE', 'OCT_OCH_MDL'); return(false);">일문단기회 : < /a>

Stacktrace:
at org.apache.jsp.MEB_002DINF_jsp.com.BmsToDoCntPortlet_jsp._jspService(BmsToDoCntPortlet_jsp.java:288)
at org.apache.jasper.runtime.HttpJspBase.service(HttpJspBase.java:69)
```



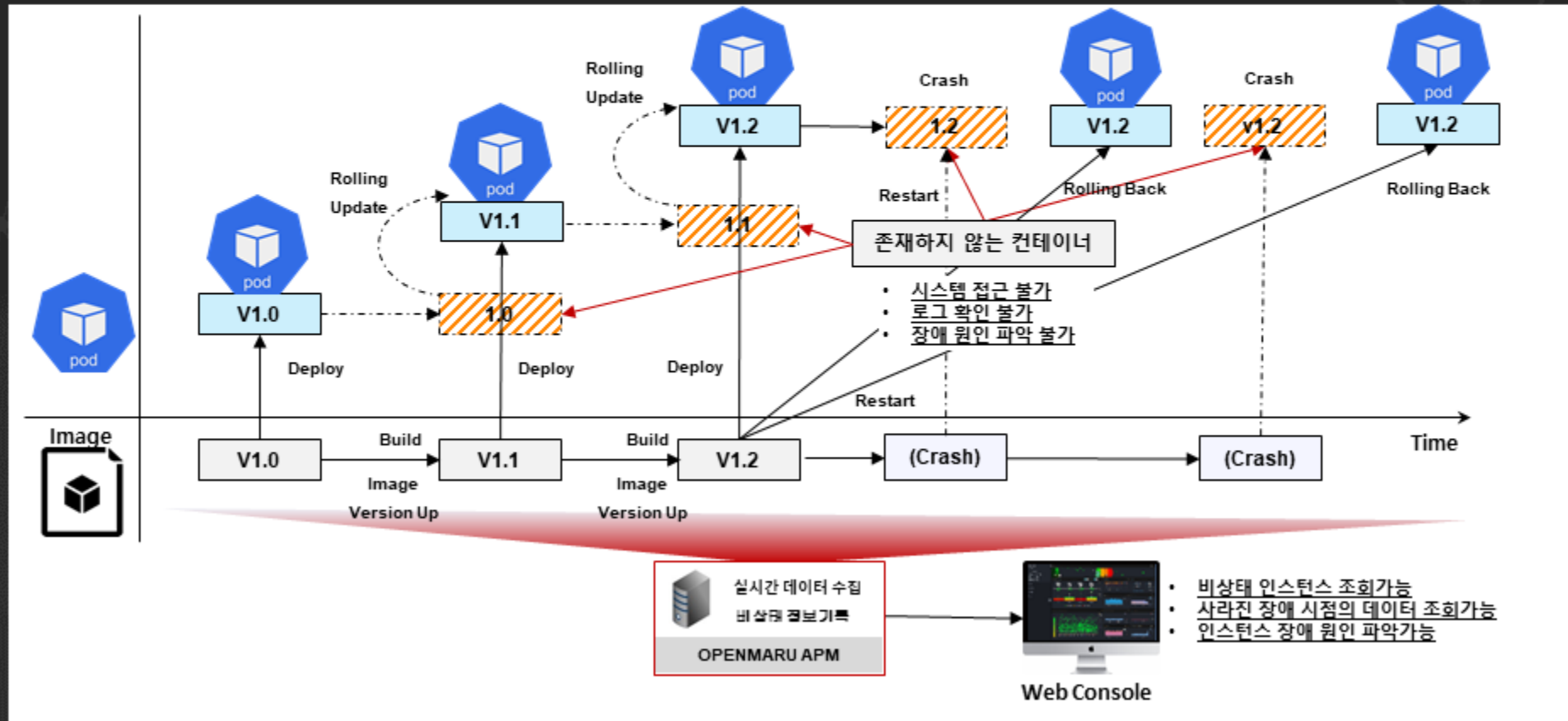
PaaS 운영



기존환경 대비 Container 환경 모니터링의 특성

# 기존환경 대비 Container 환경 모니터링의 특성

- VM 환경에서는 동일한 인스턴스에 새 버전 애플리케이션을 배포
- Container 환경에서는 새로운 인스턴스에 새 버전 애플리케이션을 배포
  - Openshift (Kubernetes) 배포 프로세스



# 비상태 인스턴스 모니터링 정보 조회 절차(1/3)



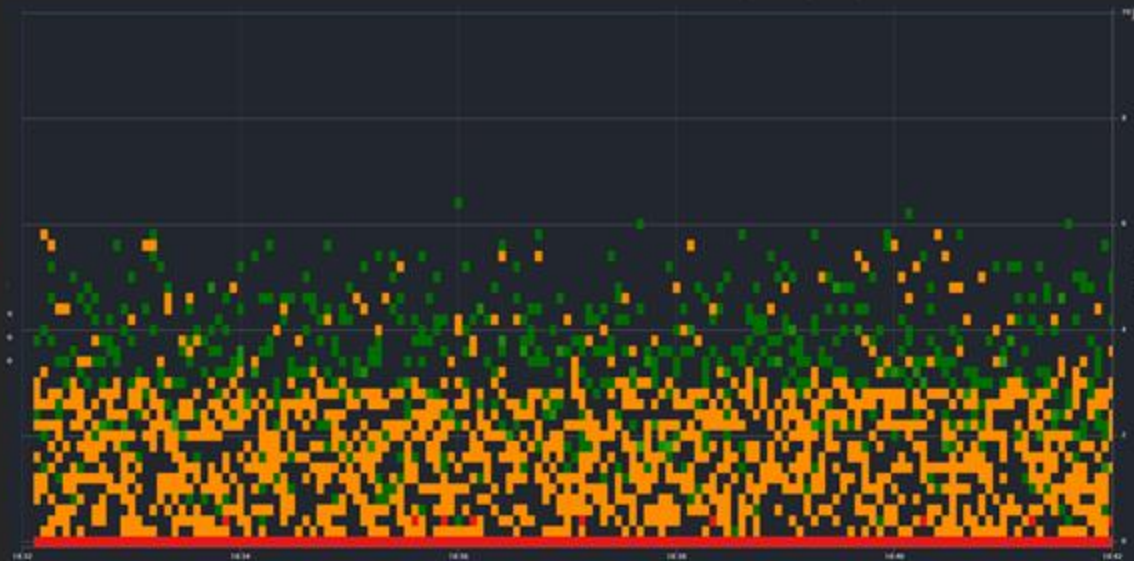
#	Enable	Ena...	Host Name	IP Address	Instance ID	Type	Status	First Date
1	<input type="checkbox"/>	Hide	custom-app-19-g5v9t	10.131.0.112	Container-19-g...	WAS	STOPPED	2021-01-31 16
2	<input type="checkbox"/>	Hide	custom-app-20-bggjn	10.131.0.116	Container-20-b...	WAS	STOPPED	2021-01-31 16
3	<input type="checkbox"/>	Hide	custom-app-21-pdvl7	10.131.0.119	Container-21-p...	WAS	STOPPED	2021-01-31 16
4	<input type="checkbox"/>	Hide	custom-app-22-cmg2f	10.131.0.124	Container-22-c...	WAS	STOPPED	2021-01-31 17
5	<input type="checkbox"/>	Hide	custom-app-23-nf6js	10.131.0.127	Container-23-n...	WAS	STOPPED	2021-01-31 17
6	<input type="checkbox"/>	Hide	custom-app-24-c9smx	10.131.0.131	Container-24-c...	WAS	STOPPED	2021-01-31 17
7	<input type="checkbox"/>	Hide	custom-app-25-w56pk	10.131.0.134	Container-25-...	WAS	STOPPED	2021-01-31 17
8	<input type="checkbox"/>	Hide	custom-app-26-bwpkn	10.131.0.137	Container-26-b...	WAS	STOPPED	2021-01-31 17
9	<input type="checkbox"/>	Hide	custom-app-27-fh2gh	10.131.0.139	Container-27-f...	WAS	STOPPED	2021-01-31 18
10	<input checked="" type="checkbox"/>	Show	custom-app-28-tszdk	10.131.0.142	Container-28-t...	WAS	STOPPED	2021-01-31 18
11	<input checked="" type="checkbox"/>	Show	custom-app-29-6mw29	10.131.0.145	Container-29-...	WAS	RUNNING	2021-01-31 18

## 비상태 인스턴스 모니터링 정보 조회 절차(2/3)

비상태 인스턴스 모니터링정보 활성화 전



비상태 인스턴스 모니터링정보 활성화 후



# 비상태 인스턴스 모니터링 정보 조회 절차(3/3)



Transactions > 2021-01-31 18:44:24 ~ 2021-01-31 18:45:51 > 1602ms ~ 4959ms

Agent	Server IP	Client IP	Instance ID	URL	Status	Warn	Duration(ms)	SQL Time(ms)	Fetch Gab	Fetch Count	Est. Time	CPU(ms)	Start Time
WAS	10.129.0.60	192.168.23.100	jws53_svc1-25-7cdgf	/spring/test/http/rest/template2	200	0	4,945	0	0	0	4,934	14.60	2021-01-31 18:44:29.312
WAS	10.129.0.60	192.168.23.100	jws53_svc1-25-7cdgf	/spring/test/http/rest/template	200	0	4,772	0	0	0	1,985	46.15	2021-01-31 18:45:07.885
WAS	10.129.0.60	192.168.23.100	jws53_svc1-25-7cdgf	/spring/test/http/rest/template	200	0	4,630	0	0	0	1,783	41.11	2021-01-31 18:44:38.809
WAS	10.129.0.60	192.168.23.100	jws53_svc1-25-7cdgf	/spring/test/http/rest/template2	200	0	4,565	0	0	0	4,560	7.99	2021-01-31 18:44:29.888
WAS	10.129.0.60	192.168.23.100	jws53_svc1-25-7cdgf	/spring/test/http	200	0	4,532	0	0	0	4,548	23.04	2021-01-31 18:44:51.097
WAS	10.129.0.60	192.168.23.100	jws53_svc1-25-7cdgf	/spring/test/http/rest/template	200	0	4,542	0	0	0	1,908	34.33	2021-01-31 18:45:39.943
WAS	10.129.0.60	192.168.23.100	jws53_svc1-25-7cdgf	/spring/test/http/rest/template2	200	0	4,340	0	0	0	4,333	7.38	2021-01-31 18:45:29.080
WAS	10.129.0.60	192.168.23.100	jws53_svc1-25-7cdgf	/spring/test/http	200	0	4,338	0	0	0	4,336	20.49	2021-01-31 18:44:47.992
WAS	10.129.0.60	192.168.23.100	jws53_svc1-25-7cdgf	/spring/test/http	200	0	4,219	0	0	0	4,277	20.25	2021-01-31 18:44:22.715
WAS	10.129.0.60	192.168.23.100	jws53_svc1-25-7cdgf	/spring/test/http/rest/template2	200	0	4,150	0	0	0	4,142	7.56	2021-01-31 18:44:40.785
WAS	10.129.0.60	192.168.23.100	jws53_svc1-25-7cdgf	/spring/test/http	200	0	4,071	0	0	0	4,068	22.39	2021-01-31 18:45:25.969
WAS	10.129.0.60	192.168.23.100	jws53_svc1-25-7cdgf	/spring/test/http	200	0	4,034	0	0	0	4,032	20.24	2021-01-31 18:44:29.681
WAS	10.129.0.60	192.168.23.100	jws53_svc1-25-7cdgf	/spring/test/http/rest/template	200	4	4,034	0	0	0	1,814	36.69	2021-01-31 18:45:24.964

Transaction Detail | Trace | StackTrace | Headers | Cookies

Name	Value	Name	Value
Request URL	GET /spring/test/http/rest/template2	Params	
Request Host	khan-jws53-svc1-test1-app-ocp-test-0k-openmaru.com	Status Code	200
Client IP	192.168.23.100	User Agent	Apache-HttpClient/4.5.3 (Java/1.8.0_192)
Start Time	2021-01-31 18:44:29.312	End Time	2021-01-31 18:44:34.257
Duration (ms)	4,945	CPU Time (ms)	14.60
JDBC Time (ms)	0	Latency (ms)	0
Thread Name	http-nio-8080-exec-4	Thread ID	41
IP	10.129.0.60	Instance ID	jws53_svc1-25-7cdgf
Agent Type	WAS	Transaction ID	Relationship > 17757042x11-284e87bc4ea317b358

Method Traces

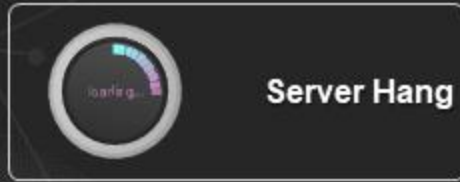
Legend: 0 <= time < 1,000ms | 1,000ms <= time < 3,000ms | 3,000ms <= time

PaaS 운영

애플리케이션 장애의 대표적인 패턴 확인



# 애플리케이션 장애의 대표적인 패턴





openmaru

제품 / 서비스에 관한 문의

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