

똑딱똑딱 배우는 Tableau 서버 관리 및 성능 향상 가이드

Tableau 서버 관리의 숨은 영웅들을
위한 생존 팁

정봉기 컨설턴트, 태블로



Forward Looking Statements

This presentation contains forward-looking statements about, among other things, trend analyses and future events, future financial performance, anticipated growth, industry prospects, environmental, social and governance goals, and the anticipated benefits of acquired companies. The achievement or success of the matters covered by such forward-looking statements involves risks, uncertainties and assumptions. If any such risks or uncertainties materialize or if any of the assumptions prove incorrect, Salesforce's results could differ materially from the results expressed or implied by these forward-looking statements. The risks and uncertainties referred to above include those factors discussed in Salesforce's reports filed from time to time with the Securities and Exchange Commission, including, but not limited to: impact of, and actions we may take in response to, the COVID-19 pandemic, related public health measures and resulting economic downturn and market volatility; our ability to maintain security levels and service performance meeting the expectations of our customers, and the resources and costs required to avoid unanticipated downtime and prevent, detect and remediate performance degradation and security breaches; the expenses associated with our data centers and third-party infrastructure providers; our ability to secure additional data center capacity; our reliance on third-party hardware, software and platform providers; the effect of evolving domestic and foreign government regulations, including those related to the provision of services on the Internet, those related to accessing the Internet, and those addressing data privacy, cross-border data transfers and import and export controls; current and potential litigation involving us or our industry, including litigation involving acquired entities such as Tableau Software, Inc. and Slack Technologies, Inc., and the resolution or settlement thereof; regulatory developments and regulatory investigations involving us or affecting our industry; our ability to successfully introduce new services and product features, including any efforts to expand our services; the success of our strategy of acquiring or making investments in complementary businesses, joint ventures, services, technologies and intellectual property rights; our ability to complete, on a timely basis or at all, announced transactions; our ability to realize the benefits from acquisitions, strategic partnerships, joint ventures and investments, including our July 2021 acquisition of Slack Technologies, Inc., and successfully integrate acquired businesses and technologies; our ability to compete in the markets in which we participate; the success of our business strategy and our plan to build our business, including our strategy to be a leading provider of enterprise cloud computing applications and platforms; our ability to execute our business plans; our ability to continue to grow unearned revenue and remaining performance obligation; the pace of change and innovation in enterprise cloud computing services; the seasonal nature of our sales cycles; our ability to limit customer attrition and costs related to those efforts; the success of our international expansion strategy; the demands on our personnel and infrastructure resulting from significant growth in our customer base and operations, including as a result of acquisitions; our ability to preserve our workplace culture, including as a result of our decisions regarding our current and future office environments or work-from-home policies; our dependency on the development and maintenance of the infrastructure of the Internet; our real estate and office facilities strategy and related costs and uncertainties; fluctuations in, and our ability to predict, our operating results and cash flows; the variability in our results arising from the accounting for term license revenue products; the performance and fair value of our investments in complementary businesses through our strategic investment portfolio; the impact of future gains or losses from our strategic investment portfolio, including gains or losses from overall market conditions that may affect the publicly traded companies within our strategic investment portfolio; our ability to protect our intellectual property rights; our ability to develop our brands; the impact of foreign currency exchange rate and interest rate fluctuations on our results; the valuation of our deferred tax assets and the release of related valuation allowances; the potential availability of additional tax assets in the future; the impact of new accounting pronouncements and tax laws; uncertainties affecting our ability to estimate our tax rate; uncertainties regarding our tax obligations in connection with potential jurisdictional transfers of intellectual property, including the tax rate, the timing of the transfer and the value of such transferred intellectual property; uncertainties regarding the effect of general economic and market conditions; the impact of geopolitical events; uncertainties regarding the impact of expensing stock options and other equity awards; the sufficiency of our capital resources; the ability to execute our Share Repurchase Program; our ability to comply with our debt covenants and lease obligations; the impact of climate change, natural disasters and actual or threatened public health emergencies; and our ability to achieve our aspirations, goals and projections related to our environmental, social and governance initiatives.



Thank you



Agenda

Tableau Server...

Topology

TSM



Tableau Server Topology



세탁+건조 일체형 vs. 세탁, 건조 분리형

세탁+건조 일체형 모델

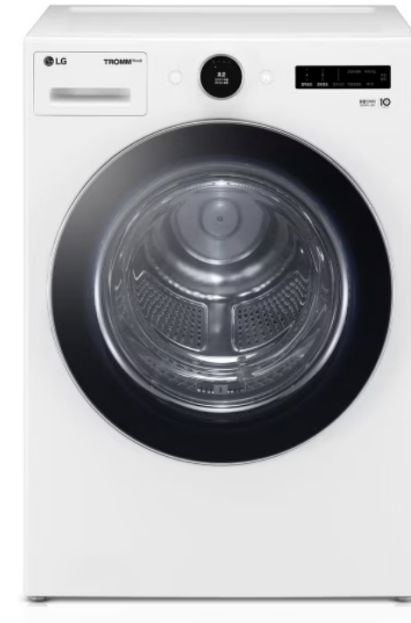


세탁기



+

건조기



성능개선을 위해 고려해야 할 주요 항목

For Tableau Configuration

자원을 많이 요구하는 프로세스간의 경합 제거

- VizQLServer
- Backgrounder
- Data Engine (Hyper)
- Repository

목적에 맞는 태블로서버 역할 부여

- Initial Node for Repository
- Application (VizQL) Nodes
- Data (Backgrounder) Nodes

태블로서버 권장 요구사항

- Follow [Minimum Production Hardware Recommendations](#)
- No cure for being under provisioned



Processes - The Resource Hungry Hippos

Tableau Server Processes that use the most system resources

VizQL Server

Uses almost 60-70% of the CPU and memory on the computer.

Loads and renders views, computes and executes queries.

We typically allocate 4 cores per VizQL process.

Backgrounder

Mainly CPU intensive.

Runs many tasks including extract refreshes, subscriptions and AD Sync.

Single-threaded, one job at a time.



Processes – The Resource Hungry Hippos

Tableau Server Processes that use the most system resources

Data Engine (Hyper)

Memory-intensive process.

Creates data extracts and processes queries.

Designed to leverage all available CPU and memory on the machine to provide the fastest response times.

PostgreSQL Repository

The default PostgreSQL deployment consumes almost 50% of system memory resources.

Tableau Server's internal database for metadata.





Tips to Enhance Efficiency

Process Topology Changes

https://help.tableau.com/current/guides/enterprise-deployment/en-us/edg_intro.htm



Multi-Purpose Topology - 5 Nodes (16 Cores Each)

Process	node1	node2	node3	node4	node5
Activation Service	✓				
Backgrounder	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
Cache Server	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
Client File Service	✓	✓	✓	✓	✓
Coordination Service	✓	✓	✓	✓	✓
Data Engine (Hyper)	✓	✓	✓	✓	✓
Data Server	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
File Store	✓	✓	✓	✓	✓
Gateway	✓	✓	✓	✓	✓
Index and Search Server	✓	✓	✓	✓	✓
License Manager	✓				
PostgreSQL Repository	✓			✓	
TSM Controller	✓				
VizPortal	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
VizQL Server	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓

Reference Topology - 5 Nodes (All 16-Cores)

Process	Primary	Backgrounder 1	Backgrounder 2	VizQL 1	VizQL 2
Activation Service	✓				
Backgrounder		✓✓✓✓	✓✓✓✓		
Cache Server	✓✓			✓✓	✓✓
Client File Service	✓			✓	✓
Coordination Service	✓			✓	✓
Data Engine (Hyper)	✓	✓	✓	✓	✓
Data Server				✓✓	✓✓
File Store	✓	✓	✓		
Gateway	✓			✓	✓
Index and Search Server	✓			✓	✓
License Manager	✓				
PostgreSQL Repository	✓			✓	
TSM Controller	✓				
VizPortal				✓✓	✓✓
VizQL Server				✓✓✓✓	✓✓✓✓

Tableau Server Initial Node

Primary Node with PostgreSQL Repository

Process	Primary
Activation Service	✓
Cache Server	✓ ✓
Client File Service	✓
Coordination Service	✓
Data Engine (Hyper)	✓
File Store	✓
Gateway	✓
Index and Search Server	✓
License Manager	✓
PostgreSQL Repository	✓
TSM Controller	✓

- 자원 경합이 높은 Repository, VizQL, Background를 다른 노드에 배치
- 사용자, 대시보드 수 증가 시 Repository에 메타데이터 데이터 증가, 사용량 증가시 http_requests 테이블의 크기가 급격하게 증가함
- Core 라이선스의 경우, 초기노드에서 File Store와 Data Engine을 제거하면. Unlicensed Node로 전환 가능



Tableau Server Data Nodes

The Backgrounder Nodes

Process	Backgrounder 1	Backgrounder 2
Backgrounder	✓✓✓✓✓✓✓✓	✓✓✓✓✓✓✓✓
Data Engine (Hyper)	✓	✓
File Store	✓	✓

- File Store, Data Engine (Hyper), Backgrounder의 주요작업은 추출파일을 만들고 새로운데이터로 교체하는 일을 수행
- CPU 자원을 필요로 하는 Backgrounder와 Memory 자원을 필요로 하는 Data Engine이 서로 자원을 효율적으로 사용
- Data Engine이 필요한 데이터를 File Store에서 바로 사용할 수 있음



Tableau Server Application Nodes

The VizQL Nodes

Process	VizQL 1	VizQL 2
Cache Server	✓ ✓	✓ ✓
Client File Service	✓	✓
Coordination Service	✓	✓
Data Engine (Hyper)	✓	✓
Data Server	✓ ✓	✓ ✓
Gateway	✓	✓
Index and Search Server	✓	✓
PostgreSQL Repository	✓	
VizPortal	✓ ✓	✓ ✓
VizQL Server	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓

- File Store가 없는 Data Engine은 많은 자원을 필요로 하지 않음
- VizQL과 File Store가 없는 Data Engine의 프로세스 배치는 자원 경합이 낮음



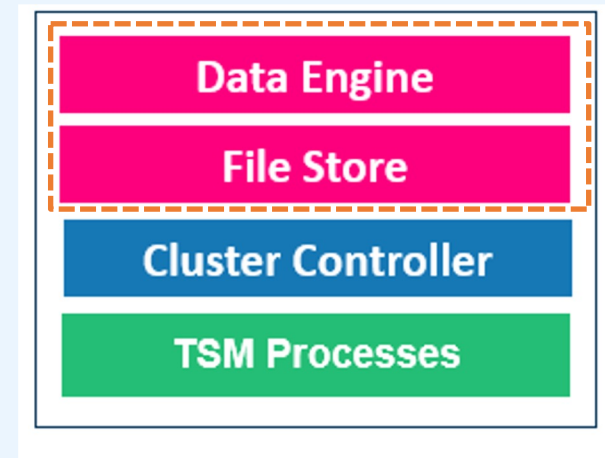
Adding HoSS Nodes

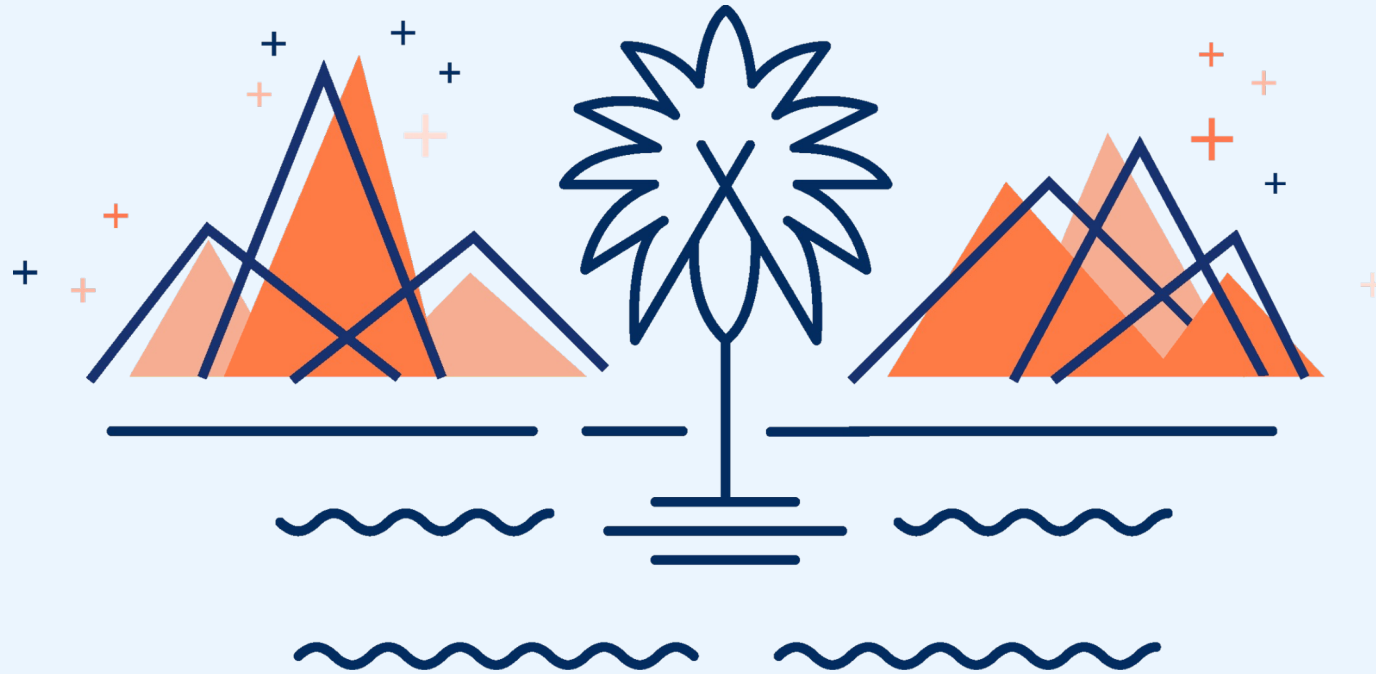
Hyper (and File Store) on a Standalone Server

Optimizing for Query Heavy Environments

- 전용 Hyper노드 : Data Engine + File Store
- 대용량 추출파일에 대한 쿼리 성능이 높음

HoSS (Hyper on a Standalone Server)





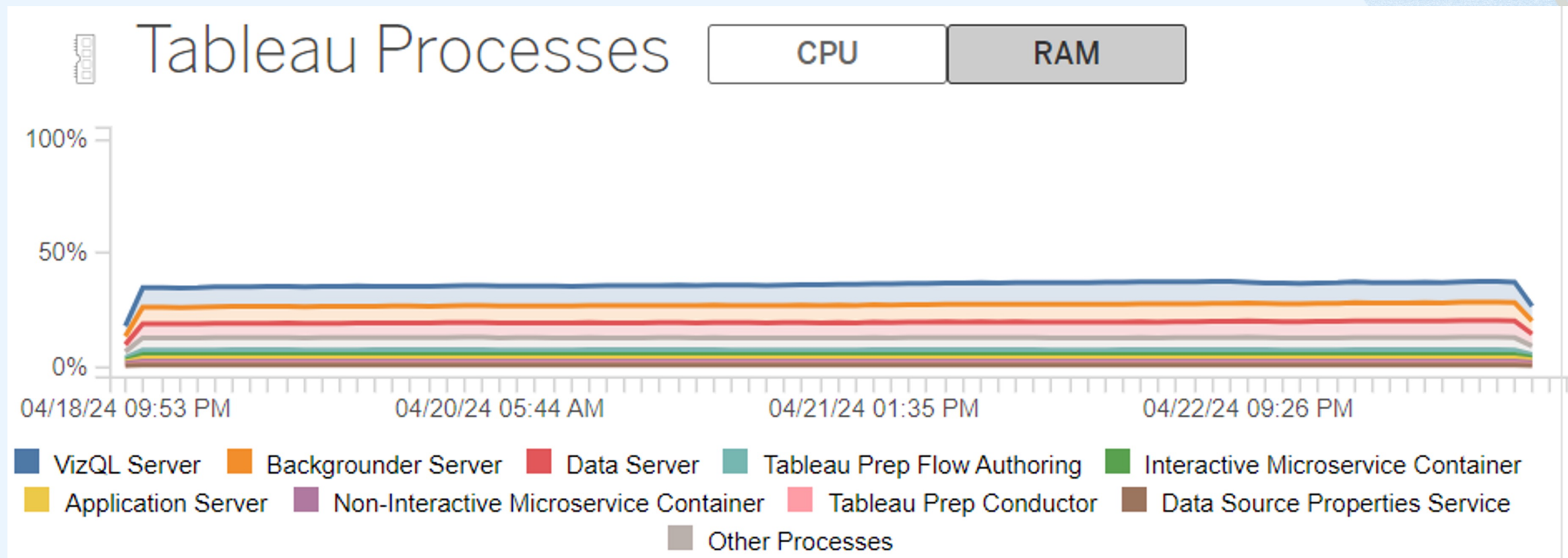
How do I know when to make changes?

RMT, Tableau Server Admin Views and Logshark



How to Identify Resource Exhaustion

Resource Monitoring Tool (RMT)



More information on RMT: [Tableau Online Help](#)



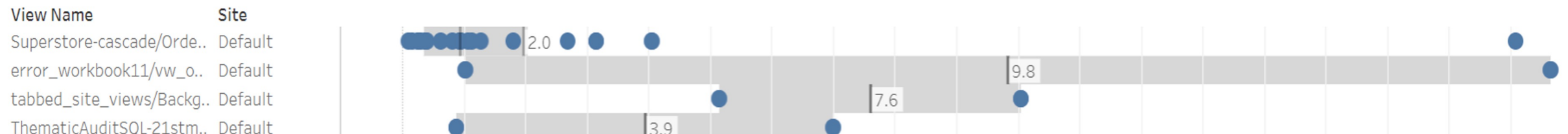
How to Identify Resource Exhaustion

Tableau Server Pre-built Admin Views

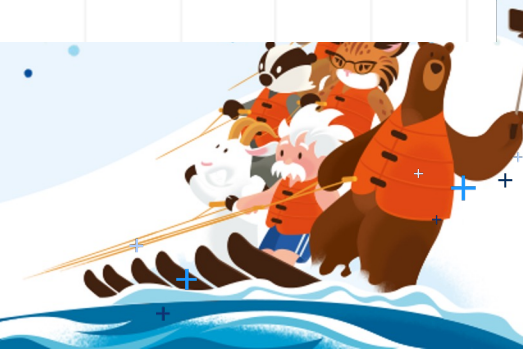
What Are the Average Load times for Views?



What Are the Exact Load times for Views?



More information on Pre-built Admin Views: [Tableau Online Help](#)



How to Identify Resource Exhaustion

[Logshark](#) Resource Manager View

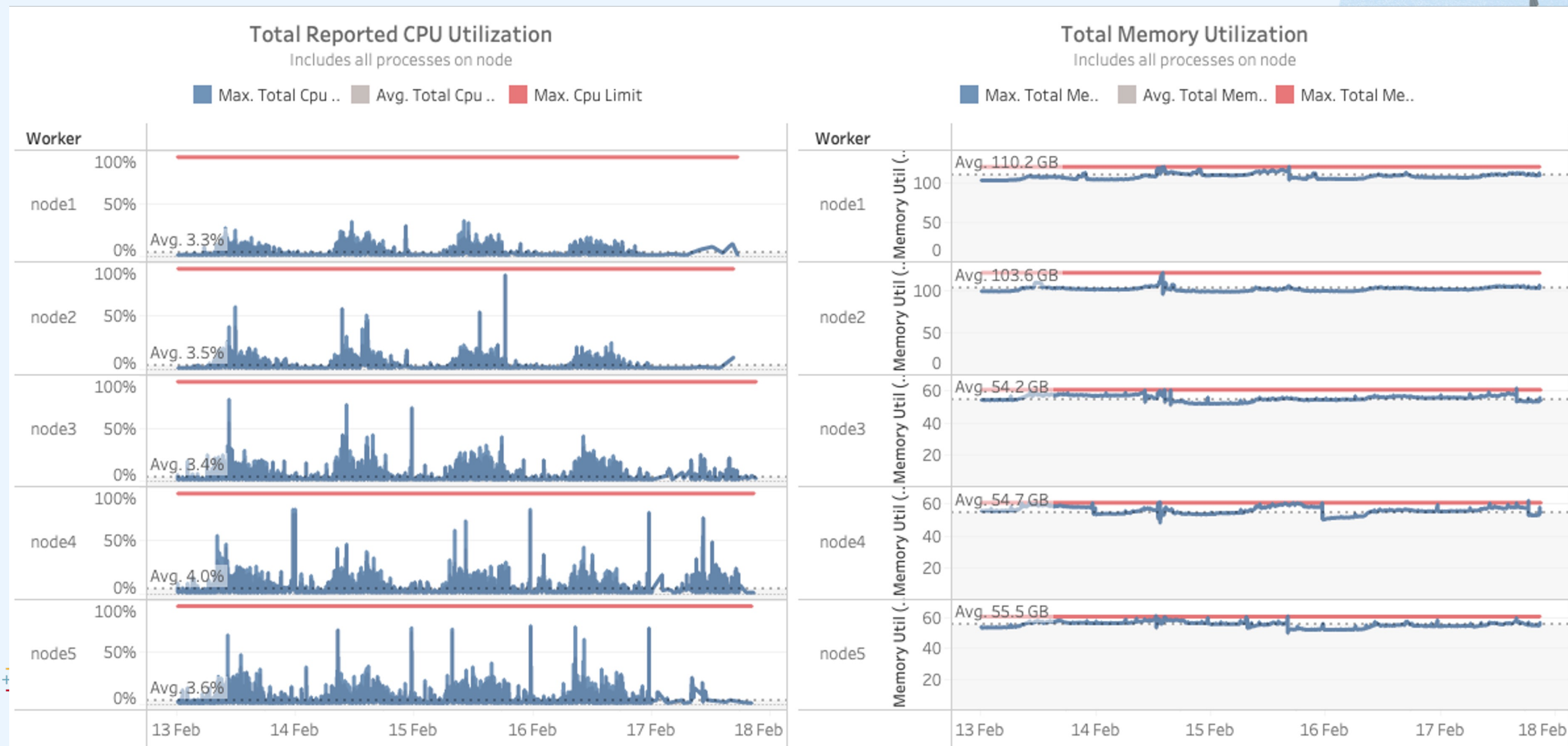
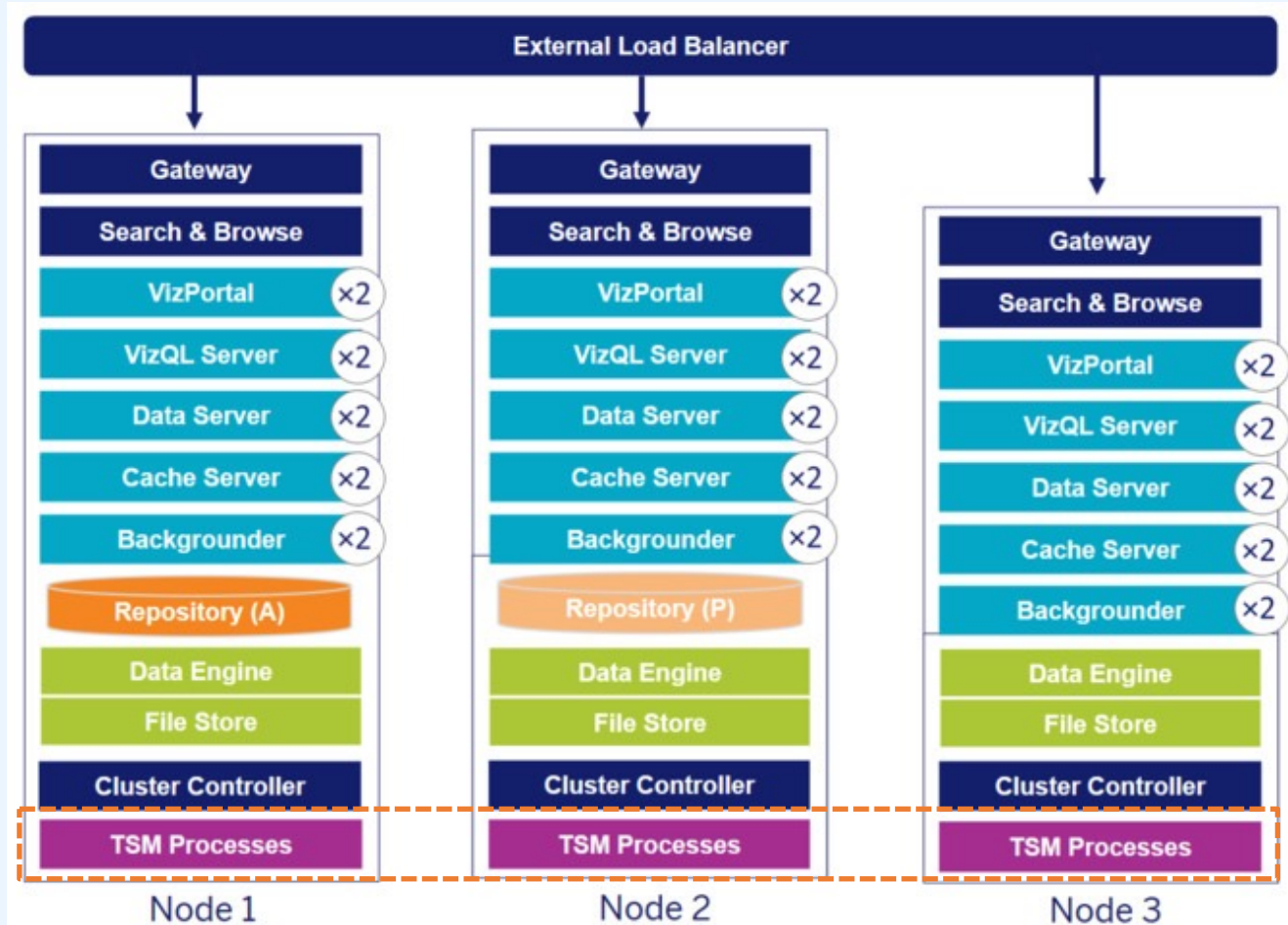


Tableau Server TSM (Tableau Services Manager)



TSM Architecture and Process Overview



Initialize TSM

Initialize
Tableau Server



TSM Main Features

Start/Stop/Restart

Licenses

Status

Configuration

Maintenance
(Backup, Restore)

Topology

Security

...



TSM New(er) features

In case you didn't know...

설치 및 업그레이드

- tsm maintenance preflight-check <permissions and ports> : 설치전 파일권한 및 포트 체크
- tsm licenses atr-configuration : Server ATR 설정(LBLM) 확인

보안 강화

- tsm maintenance jmx disable
- Self-signed -> Custom cert (U refresh on expiry)

백업기능 강화

- Native schedules for backups (not cron jobs) tsm schedules
- tsm maintenance validate-backup-basefilepath



3 Toolsets to Manage TSM

Not to confuse with Tabadmin (deprecated), Tabcmd or Rest API!

TSM Web UI

More details than TS UI
(controller, license svr)

Port 8850

Remote possible

Limited functionality

TSM CLI

More powerful than UI

Can be used in scripting
Conjunction with Devops
tooling

TSM API

Alpha Release



TSM + 고객사 모니터링 도구



이상감지



TSM - License 체크

Process Status

The real-time status of processes running in Tableau Server.

Process	Primary 10.32.139.21	Worker 10.32.139.22
Gateway	✓	✓
Application Server	✓	✓
API Server	✓	✓
VizQL Server	✓ ✓	⚠
Cache Server	✓ ✓	✓ ✓
Search & Browse	✓	✓
Backgrounder	✓	✓
Data Server	✓ ✓	✓ ✓
Data Engine	✓	✓
File Store		
Repository		

[tableau@tableau-server-0 /]\$ tsm licenses list
No licenses are currently activated.

Refresh Status

✓ Active 🔄 Busy ✓ Passive ⚠ Unlicensed ✗ Down ☐ Status unavailable



TSM - License 체크

TSM CLI 활용

\$ tsm licenses list

화면의 결과를 모니터링 툴을 사용하여 라이선스 체크

```
[bjeong@1c5cf696ed79408 ~]$ tsm licenses list
Number of product keys: 1
The following license keys will expire soon. Access renewal resources including information on how to renew your software or change your billing preferences here https://www.tableau.com/support/renew
TSVK-THIS-DATA-GOES-HARD
KEY                TYPE          CREATOR          EXPLORER          VIEWER          DATA MANAGEMENT          GUEST ACCESS LIC EXP          MAIN
T EXP      UPDATABLE  LBLM            ADVANCED MANAGEMENT
24         false      false          true              1000            750                    500            true              false              9/16/24          9/1/
```



TSM - License 체크

Not GA But Try it

TSM API 활용
(Alpha version)

https://tsm ip:8850
/api/0.5/licensing/productKeys

REST-API를 통해 라이선스키 정보를 JSON형태로 체크

HTTP TSM / Licensing / List product keys

GET

https://{{server}}:{{port}}/api/{{version}}/licensing/productKeys

Params Authorization Headers (9) Body Scripts Tests Settings

Query Params

Key	Value
Key	Value



Body Cookies (1) Headers (10) Test Results

Pretty

Raw

Preview

Visualize

JSON



```
1 {
2   "productKeys": {
3     "items": [
4       {
5         "itmanagementBundleEnabled": true,
6         "dataManagementBundleEnabled": true,
7         "backgroundNodeRoleEnabled": true,
8         "filestoreNodeRoleEnabled": true,
9         "identityBasedActivationEnabled": false,
10        "interactorUserCount": 750,
11        "basicUserCount": 500,
12        "authorUserCount": 1000,
13        "guestAllowed": false,
14        "flowsEnabled": true,
15        "isUpdatable": false,
16        "isActive": true,
17        "serial": " ",
18        "expiration": "2024-09-16T12:00:00.000Z",
19        "startDate": "2024-02-11T12:00:00.000Z",
```

TSM - Process 상태 체크

Process	DS6357	
Gateway	✓	
Application Server	✓	
API Server	✓	
VizQL Server	✓	✓
Cache Server	✓	✓
Search & Browse	✓	
Backgrounder	✓	
Data Server	✗	✓
Data Engine	✓	
File Store	✓	
Repository	✓	
Refresh Status		
✓ Active ↻ Busy ✓ Passive ⚠ Unlicensed ✗ Down □ Status unavailable		



TSM - Process 상태 체크

TSM CLI 활용

\$ tsm status -v

Tableau Server에서 동작중인 프로세스들의 상태를 모두 확인 가능

```
[tbadmin@1c5cf696ed79408 ~]$ tsm status -v
node1: localhost
Status: RUNNING
'Tableau Server Gateway 0' is running.
'Tableau Server Application Server 0' is running.
'Tableau Server Interactive Microservice Container 0' is running.
'MessageBus Microservice 0' is running.
'Relationship Query Microservice 0' is running.
'Credentials Service 0' is running.
'Recommendations Microservice 0' is running.
'Tableau Server VizQL Server 0' is running.
'Tableau Server VizQL Server 1' is running.
'Tableau Server Cache Server 0' is running.
'Tableau Server Cache Server 1' is running.
'Tableau Server Coordination Service 0' is running.
'Tableau Server Cluster Controller 0' is running.
'Tableau Server Backgrounder 0' is running.
'Tableau Server Backgrounder 1' is running.
'Tableau Server Non-Interactive Microservice Container 0' is running.
```

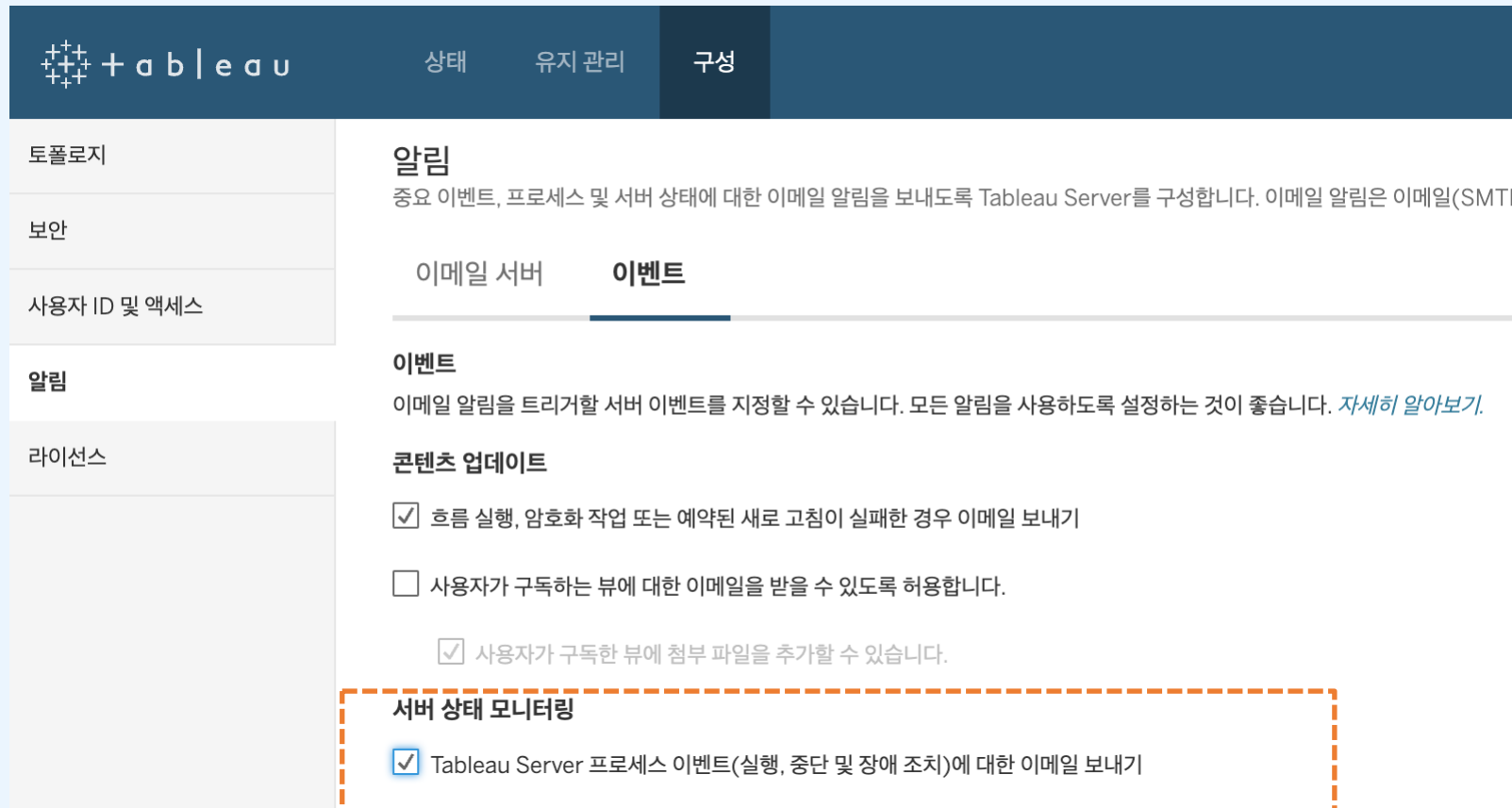


TSM - Process 상태 체크

TSM Web UI

TSM Web → 구성 → 알림 → 이벤트

특정 프로세스의 상태만 체크 가능
Ex) data engine, file store, gateway, repository server processes



Tableau

상태 유지 관리 구성

토폴로지

보안

사용자 ID 및 액세스

알림

라이선스

알림

중요 이벤트, 프로세스 및 서버 상태에 대한 이메일 알림을 보내도록 Tableau Server를 구성합니다. 이메일 알림은 이메일(SMTP)

이메일 서버 이벤트

이벤트

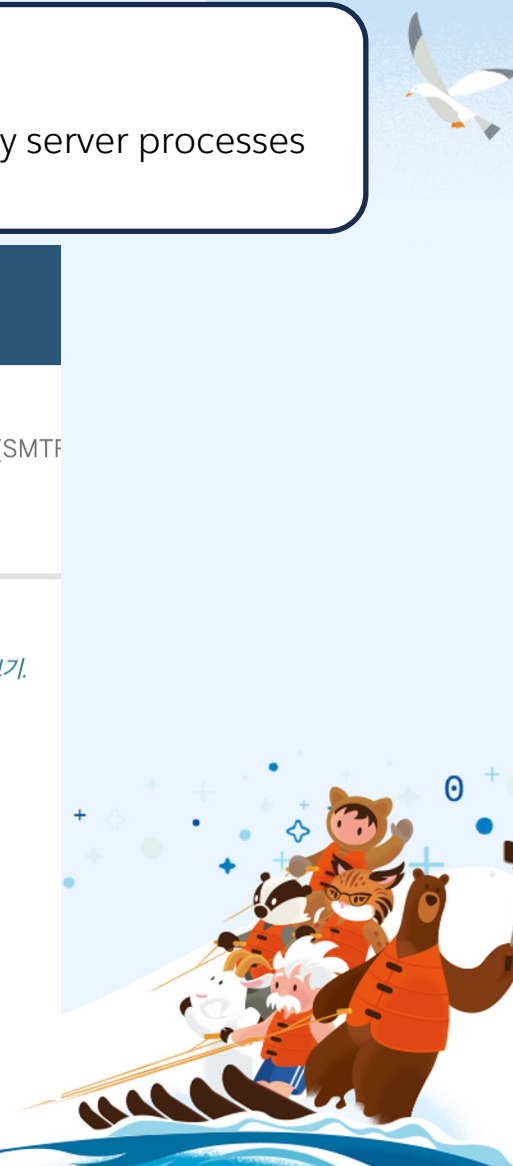
이메일 알림을 트리거할 서버 이벤트를 지정할 수 있습니다. 모든 알림을 사용하도록 설정하는 것이 좋습니다. [자세히 알아보기](#).

콘텐츠 업데이트

- ☒ 흐름 실행, 암호화 작업 또는 예약된 새로 고침이 실패한 경우 이메일 보내기
- ☐ 사용자가 구독하는 뷰에 대한 이메일을 받을 수 있도록 허용합니다.
- ☒ 사용자가 구독한 뷰에 첨부 파일을 추가할 수 있습니다.

서버 상태 모니터링

- ☒ Tableau Server 프로세스 이벤트(실행, 중단 및 장애 조치)에 대한 이메일 보내기



TSM - Process 상태 체크

TSM Web
Service

http(s)://Tableau Server
[/admin/systeminfo.xml](http://admin/systeminfo.xml)

Web Service 결과를 XML로 반환, 모니터링 툴과 연계

← → ↻ ⚠ Not Secure | 10.108.16.218/admin/systeminfo.xml

★ Bookmarks 📁 Translate 🌐 Aloha! 🔑 Tableau OKTA Com 🔗 MyTableau 🎨 Tableau Help(Engl... 🎨 Tableau Help(한글) 📁 Tableau 📁 Work-Etc 🌐 Grammarly 🎨 TS2022

This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<systeminfo xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <machines>
    <machine name="3963ad840af84fc.tsi.lan" external="false">
      <repository worker="3963ad840af84fc.tsi.lan:8060" status="Active" preferred="false"/>
      <applicationserver worker="3963ad840af84fc.tsi.lan:8951" status="Active"/>
      <vizqlserver worker="3963ad840af84fc.tsi.lan:8062" status="Active"/>
      <vizqlserver worker="3963ad840af84fc.tsi.lan:8947" status="Active"/>
      <dataserver worker="3963ad840af84fc.tsi.lan:8030" status="Active"/>
      <dataserver worker="3963ad840af84fc.tsi.lan:8244" status="Active"/>
      <backgrounder worker="3963ad840af84fc.tsi.lan:8340" status="Active"/>
      <backgrounder worker="3963ad840af84fc.tsi.lan:8942" status="Active"/>
      <flowprocessor worker="3963ad840af84fc.tsi.lan:8290" status="Active"/>
      <gateway worker="3963ad840af84fc.tsi.lan:80" status="Active"/>
      <hyper worker="3963ad840af84fc.tsi.lan:8231" status="Active"/>
      <searchandbrowse worker="3963ad840af84fc.tsi.lan:8754" status="Active"/>
      <cacheserver worker="3963ad840af84fc.tsi.lan:8699" status="Active"/>
      <cacheserver worker="3963ad840af84fc.tsi.lan:8021" status="Active"/>
      <filestore worker="3963ad840af84fc.tsi.lan:8176" status="Active" pendingTransfers="0" failedTransfers="0" syncTimestamp="2022-02-24T04:00:37.603Z"/>
      <clustercontroller worker="3963ad840af84fc.tsi.lan:8431" status="Active"/>
      <coordination worker="3963ad840af84fc.tsi.lan:8981" status="Active"/>
      <metrics worker="3963ad840af84fc.tsi.lan:8038" status="Active"/>
    </machine>
  </machines>
  <service status="Active"/>
</systeminfo>
```



from Salesforce



TSM - Process 상태 체크

Not GA But Try it

TSM API 활용
(Alpha version)

https://tsm ip:8850
/api/0.5/status

REST-API를 통해 라이선스키 정보를 JSON형태로 체크

HTTP TSM / Status / Get server status

GET

https://{server}:{port}/api/{version}/status

Params Authorization Headers (8) Body Scripts Tests Settings

Query Params

Key	Value
Key	Value



Body Cookies (1) Headers (10) Test Results Status: 200 OK

Pretty Raw Preview Visualize JSON

```
80      "processStatus": "Active",
81      "currentDeploymentState": "Enabled",
82      "microservices": {},
83      "instanceId": "0",
84      "binaryVersion": "20242.24.0719.1101"
85    },
86    {
87      "timestampUtc": 1724050378469,
88      "processStatus": "Active",
89      "currentDeploymentState": "Enabled",
90      "microservices": {},
91      "instanceId": "1",
92      "binaryVersion": "20242.24.0719.1101"
93    }
94  ],
95  "serviceName": "dataserver"
96  }
```

TSM - Backup 스케줄링

Tableau Server 백업 명령어를 Cron Job을 사용해 스케줄링
OR

Tableau Schedule 명령어를 사용해 스케줄링

예) 요청사항 매일 새벽 1시에 ts_backup 백업파일이름으로 백업 수행
tsm maintenance backup -f **ts_backup** --ignore-prompt --multithreaded
-sn **tableau_backup** -sr **daily** -st **01:00**

예) 스케줄링 리스트 확인
tsm schedules list

```
[bjeong@1c5cf696ed79408 ~]$ tsm schedules list
Schedule ID: 2
  Name: tableau_backup
  Type: GenerateBackupJob
  State: Active
  Next run at: 8/20/24, 1:00 AM
  Recurrence type: DAILY, 01:00
```



TSM - 로그 관리 스케줄링

Tableau Server 로그관리 명령어를 Cron Job을 사용해 스케줄링

- 로그레벨 수준, 프로세스의 개수, 사용량에 따라 로그는 기하급수적으로 증가
- Single Node의 경우 단순 로그 삭제로 해결 가능, Multi Node로 구성된 경우 Node간 동기화 정보 Crack발생 가능성 높음

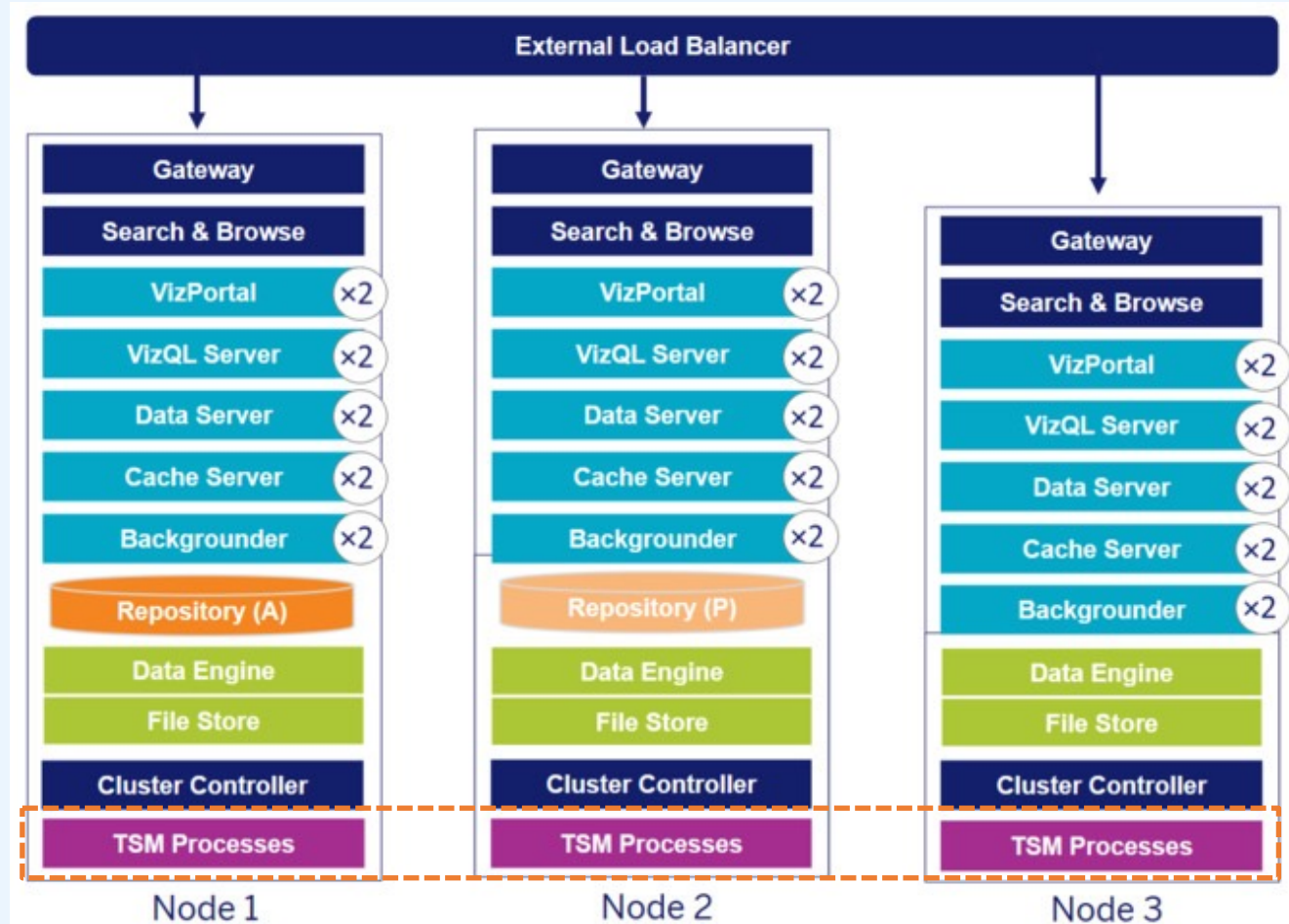
예) 최근 14일간의 로그를 제외한 로그 삭제
`tsm maintenance cleanup -l --log-files-retention 14`

```
[bjeong@1c5cf696ed79408 ~]$ tsm maintenance cleanup -l --log-files-retention 14
Starting the cleanup job.
The last successful run of CleanupJob took 0 minute(s).

Job id is '5', timeout is 60 minutes.
100% - Deleting old log files.
Cleanup completed.
```



TSM – TSM서비스 정지 및 시작



TSM 서비스 시작/정지 방법

Path :
[Tableau Server Binary
위치]/packages/script[Tableau Server 버전]

Start File : start-administrative-services
Stop File : stop-administrative-services

Tableau Server가 Running상태에서
TSM 서비스를 정지하면 Tableau
Server로 정지됨

ETC – EOS (End of Support) 체크 및 업그레이드

Tableau Server의 유지 관리 및 지원 종료 날짜

RELEASE	최초(.0) 릴리스 날짜	유지 관리 및 기술 지원 종료	제한적 지원 종료
2024.2	2024/07/01	2026/07/01	2027/07/01
2023.3	2023/10/24	2025/10/24	2026/10/24
2023.1	2023/03/14	2025/03/14	2026/03/14
2022.3	2022/10/18	2024/10/18	2025/10/18
2022.1	2022/03/30	2024/03/30	2025/03/30
2021.4	2021/12/09	2023/12/09	2024/12/08

<https://www.tableau.com/ko-kr/support/services>



Summary

Tableau 서버의 생존팁은 **유비무환**(미리 대비하고 있으면 걱정할 일이 없다) 입니다.

정기적인 백업/로그 관리

TSM + 모니터링/개발도구

개발/테스트 환경 점검 후 운영환경 반영

**기본이
가장 중요합니다.**



Thank you

