GREENPLUM DATABASE®

Open Source AceCon 2021 智能云边开源峰会

AI x Cloud Native x Edge Computing

人工智能×云原生×边缘计算

演讲主题

AI on Greenplum Cloud

Greenplum Cloud助力AI科学计算

杨峻峰

Greenplum内核研发工程师

强大的数据库分析平台

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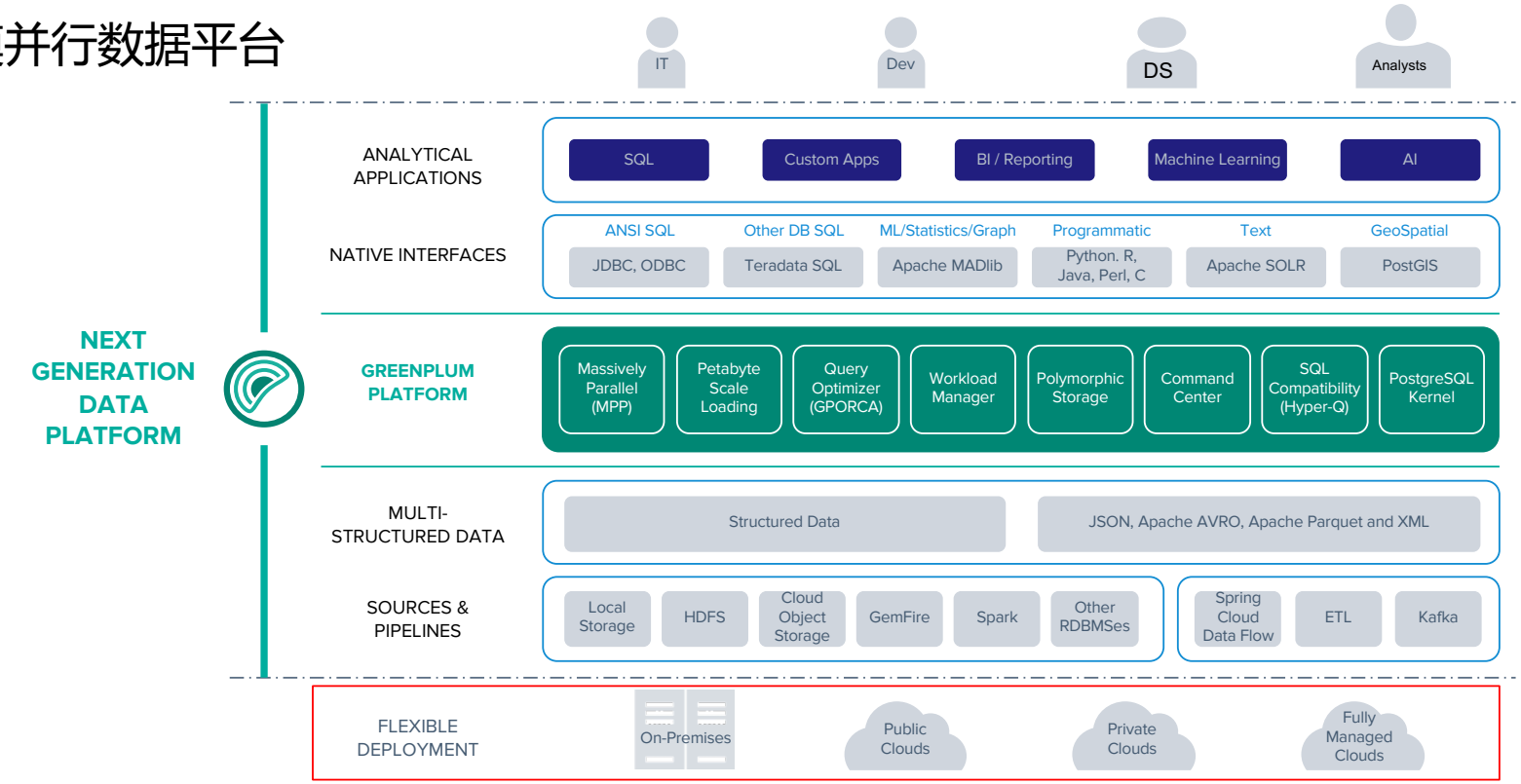
一个用于分析，机器学习的开源大规模并行数据平台

PostgresSQL

+ Massively Parallel Processing

+ Extra features

+ And addons



强大的数据库分析平台

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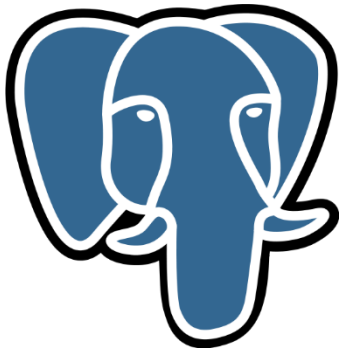
Greenplum Major Versions

- 持续继承，并与 PostgreSQL 保持一致

Greenplum V7

- Postgres v12
- 既时编译使长查询更快
- 多核处理加速
- 块范围索引 (BRIN) 类似于 zonemaps，用于跳过范围外的数据块
- 用于查询调优的多列统计信息
- Upsert 命令使ETL更容易
- 用于细粒度控制的行级安全性
- 存储过程中支持事务
- SCRAM认证更安全



Greenplum 数据联邦（Data Federation）

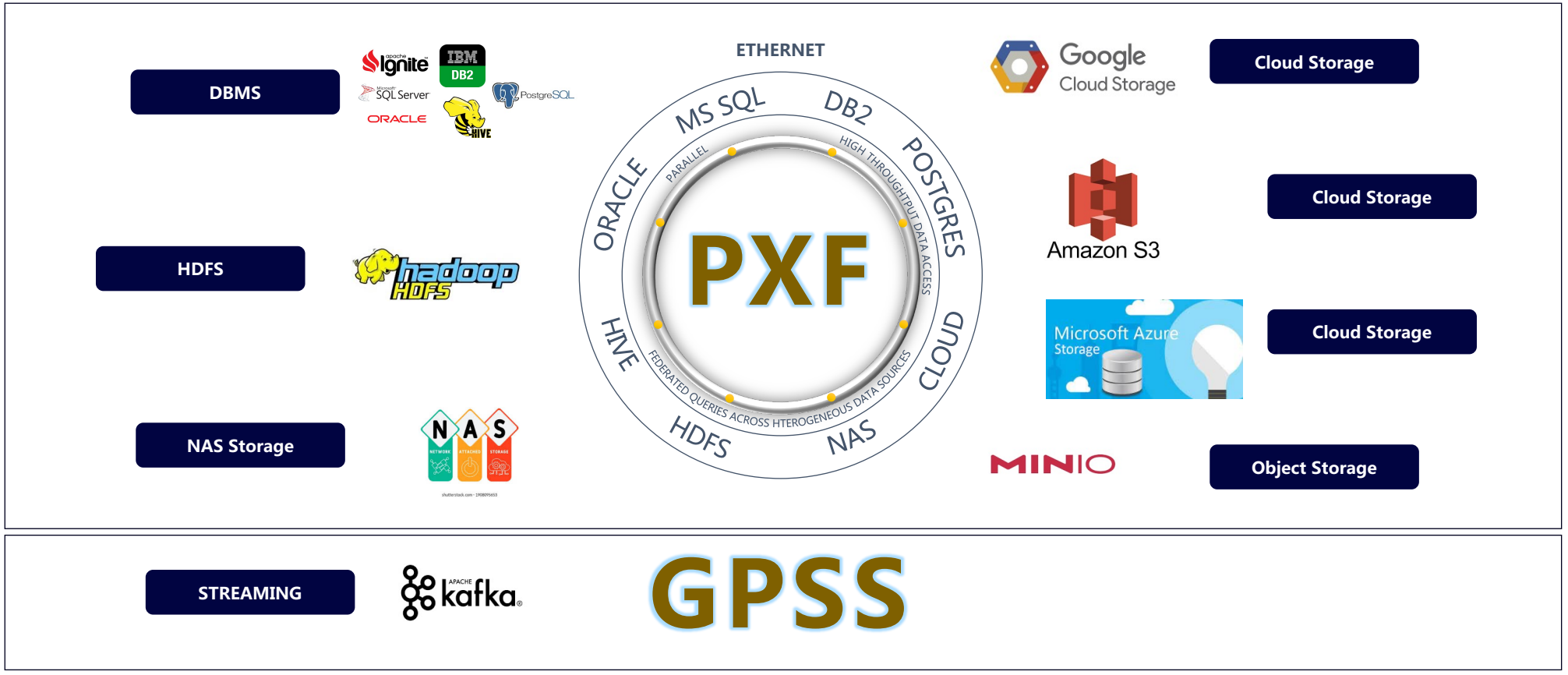
丰富的数据接口

❑ **Platform Extension Framework (PXF)**

- Provides a simple interface through an external table
- Provides the best performance through parallel data loading/extraction

❑ **Greenplum Stream Server (GPSS)**

- Provide Kafka Connector for streaming data data processing
- Avro, CSV, Text, JSON format support



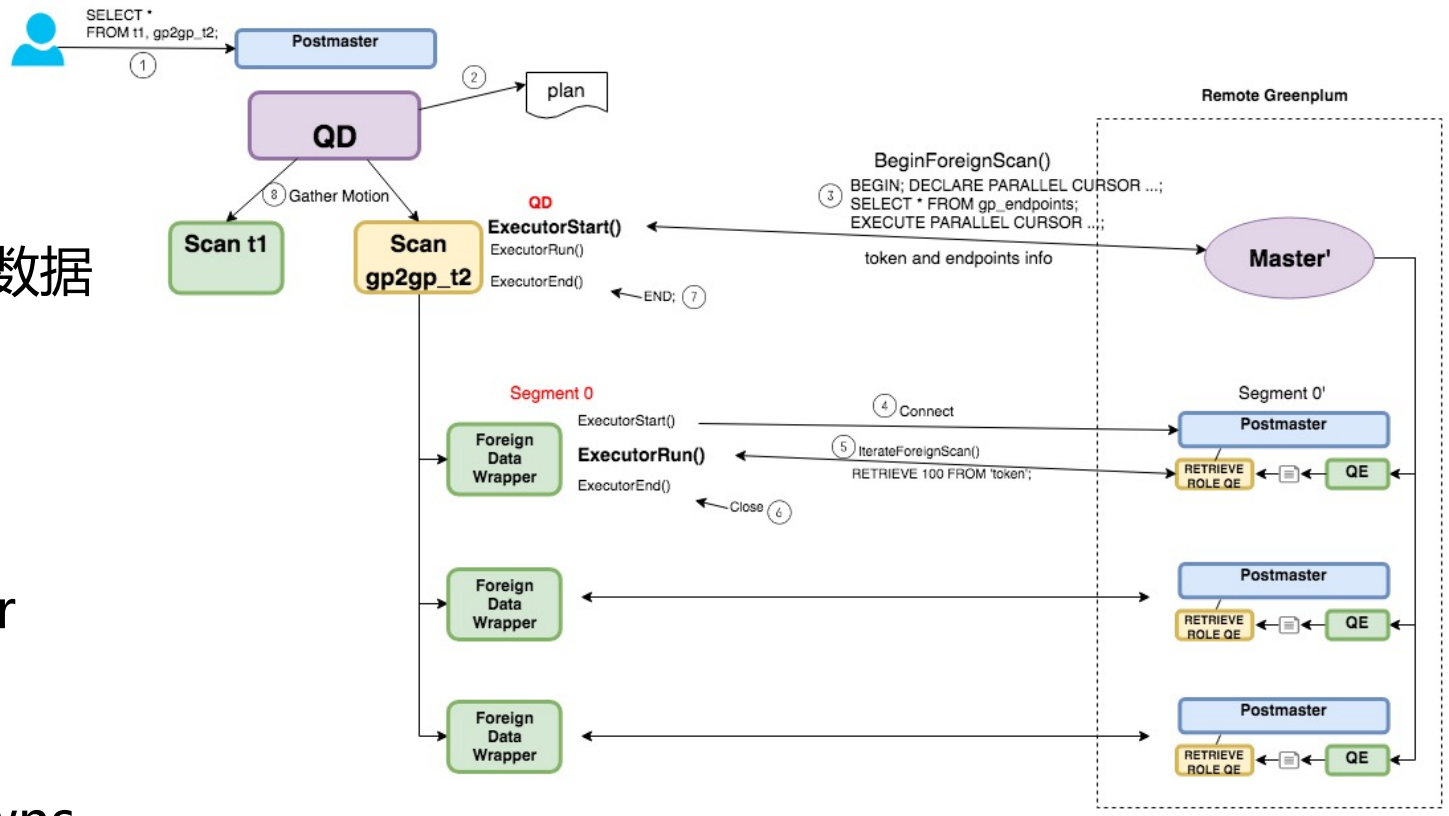
跨集群数据服务

Key Outcomes

- 避免数据复制
- 公司部门和用例之间高度隔离
- 通过创建集群到集群的连接来提高数据承载量和并发的可扩展性

Greenplum Federation

- 可感知的 Optimizer and Executor
- 可感知的 MPP Segments
- 更智能的查询优化 Joins, Pushdowns



2022 Preview

Greenplum 与 AI

机器学习库

- 一个基于SQL的数据库内置的可扩展机的器学习库
- 强大的分析能力
- 将机器学习逻辑与数据库特定的实现细节分开
- 充分利用MPP架构处理海量数据
- Apache ASF上的顶级开源项目

https://github.com/apache/madlib

图分析

Graph Algorithms and Measures

Graph-based Features

	Types	Question	Features
1	**Group**	*"What are the sub-graphs, component, communities?"*	weakly-connected component
2	**Structure**	*"What is the character of the network structure?"*	Density, Diameter, Average path length, Modularity
3	**Path**	*"What is the shortest path (distance) among vertices?"*	Single source shortest path, All pairs shortest path, Breadth-First Search
4	**Centrality**	*"What are the most important vertices within a graph?"*	Degree (in/out, weight), Closeness, PageRank, Hub, Authority, Betweenness, Clustering coefficient

Social Network

* Grandjean, M. (2016)

Epidemiology

* http://www.netminer.com/communi

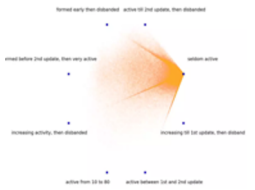
Bank Risk

* https://cambridge-intelligence.com

1st Party Fraud

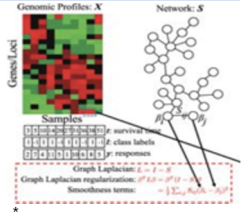
* www.infoglide.com

MMO Role-Playing Game



* www.researchgate.net

Chemistry



* https://www.nature.com/article

Gene

* www.researchgate.net

Manufacturing

* https://blog.trifinance.com

文本检索和NLP

- **Extract** data from binary or human readable formats into data that a machine can understand and operate on.
- **Index** the text data, so we can quickly search for specific text and documents.
- **Search** the text for patterns and keywords.
- **Analyze** what the text actually means.

数据分析扩展语言

- Greenplum原生
  - UDF
  - UDA
  - 支持优化器优化
- 内核逻辑支持其他语言解释器/编译器
  - R/Python/Perl/Java/C/C++/...
  - 支持加载第三方库
- 容器化和客户端组件支持
  - PL/Container
  - GreenplumR

Spark 连接

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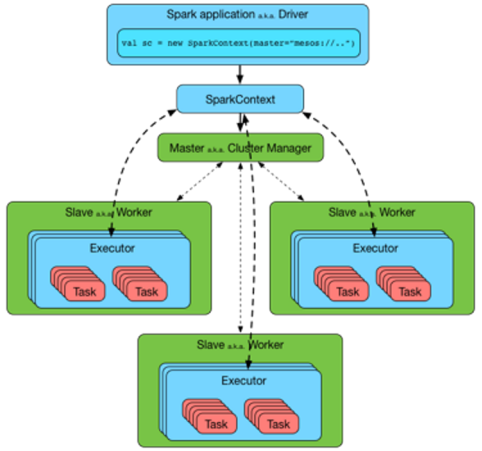
Greenplum Driver for Spark

- Spark 代码中引用 Greenplum 数据源
- Spark 和 Greenplum 都是多节点并行引擎
- 通过网络高速并行传输数据
- 从 Greenplum 读取到内存中进行 Spark 处理
- 从 Spark 写入 Greenplum 以实现数据持久化
- 无需将数据导出和复制到位于 Greenplum 之外的文件

APACHE Spark™

In-memory processing



Spark - Greenplum connector

我们的课程

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https://cloud.tencent.com/edu/paths/series/GreenPlum

Greenplum联合腾讯云大学的机器学习课程

Greenplum AS A Service

Run your analytics anywhere you need it

Infrastructure Agnostic

Bare-Metal

Private Cloud

vmware vSphere

openstack.

Public Cloud

amazon web services

Microsoft Azure

Google Cloud Platform

vmware vSphere

VMware GCP AWS Azure

Google Container Engine

Other Kubernetes (on VMs or not)

Open Source - 100% portable software solution

透明加密 (for cloud)

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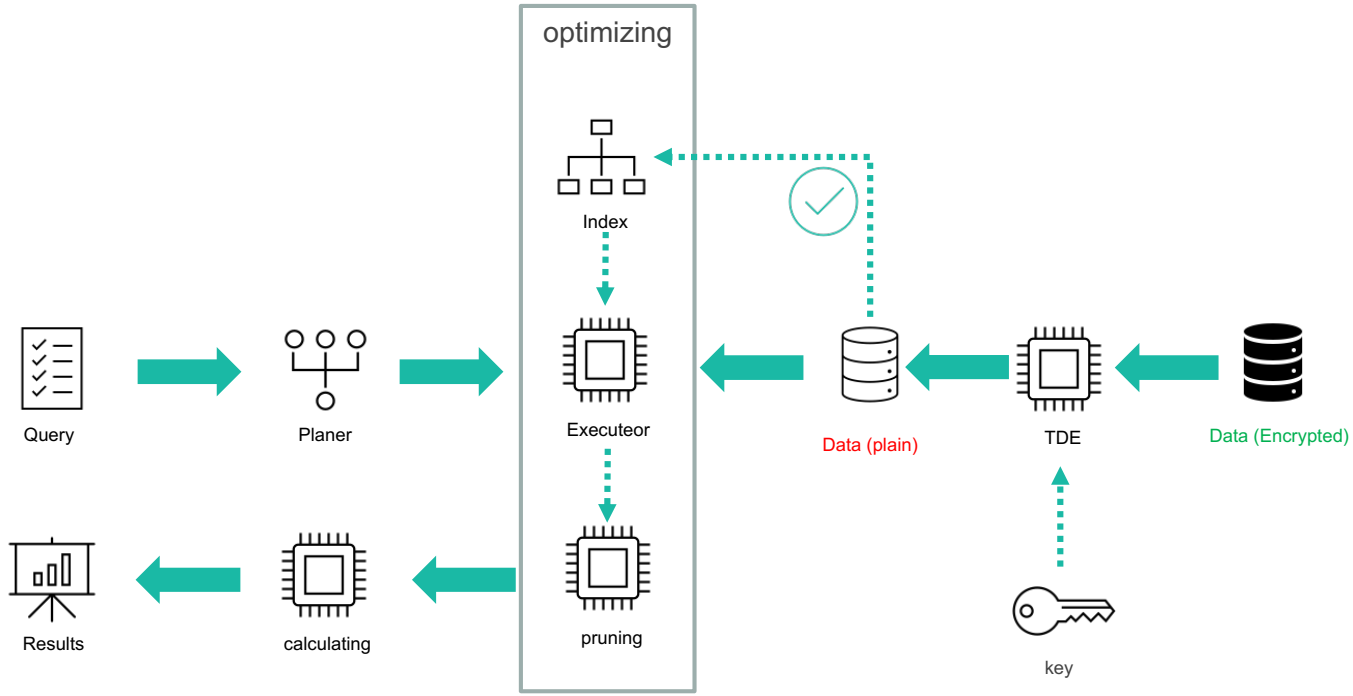
Key Outcomes

- 防止数据中心操作员访问磁盘上的数据
- 防止单个密钥丢失危及所有数据

Greenplum Transparent Data Encryption

- 磁盘上的表文件、系统文件的加密
- 主密钥将存储在外部 KMS 服务器上。
- 主要/对象密钥将存储在 GPDB Master 上
- 多级密钥层次结构
- 支持密钥轮换



GPCC

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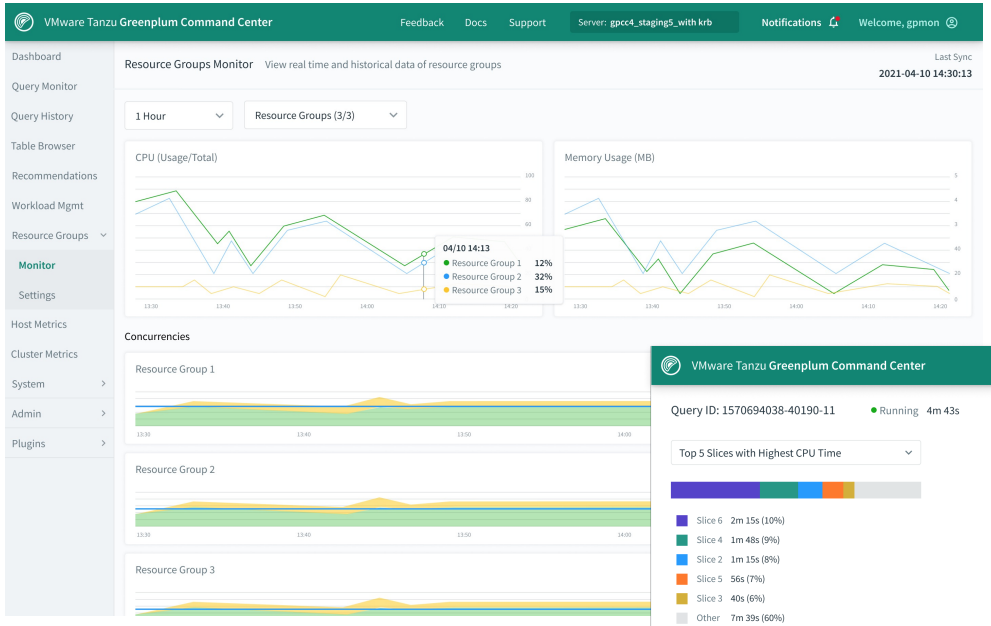
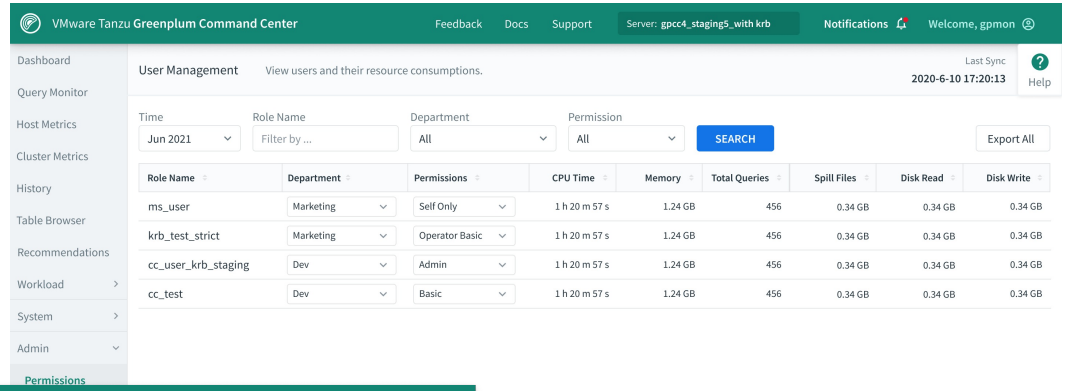
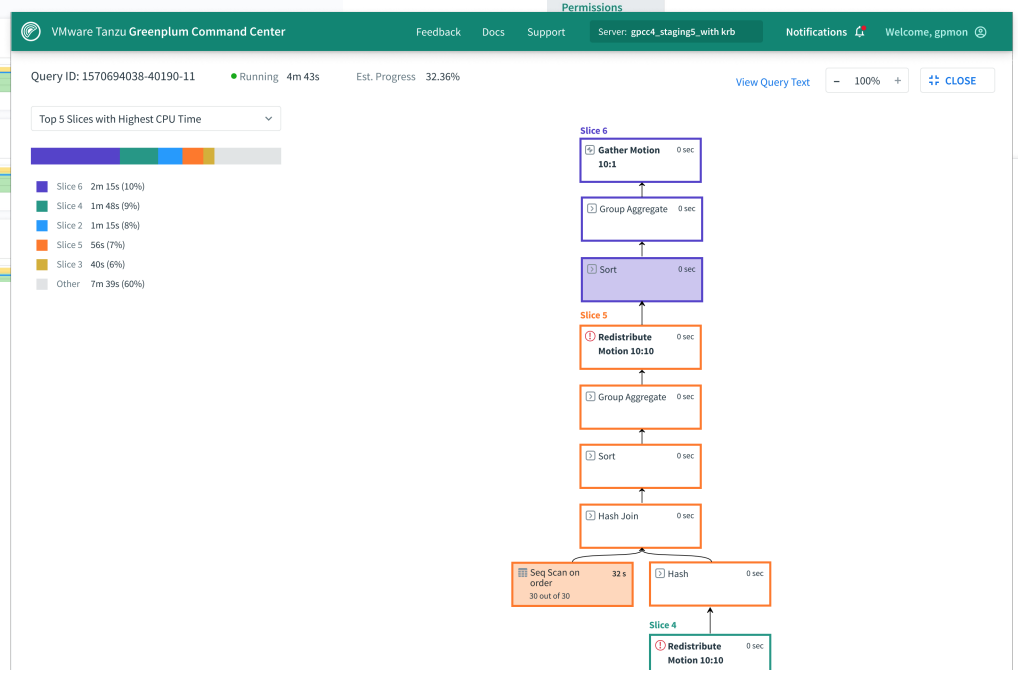
Greenplum command center







Greenplum On vSphere

提高自动化程度并减少运维

- Greenplum vSphere OVA Deployment
- 从 VMware 提供的 OVA 文件自动部署
- 使用OVA提供的功能来完成Day 1 and Day 2的操作部署
- 通过VMWare提供的下载保证安全和快速patch应用
- 减少对虚拟机的登录配置需求

VMWARE GREENPLUM
AS A SERVICE

GREENPLUM DATABASE®

在AWS中的VMware Cloud中部署

由VMware负责管理和运维

服务的修复和升级托管给VMWare Cloud

安全的数据存储和传输

备份托管

在线快照

提供增强的Greenplum Command Center

内置所有扩展组件

存储计算分离

GREENPLUM DATABASE®

微信技术讨论群
微信搜索添加“gp_assistant”
加入技术讨论

微信公众号
搜索添加“Greenplum中文社区”
技术干货、行业热点、活动预告

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Thank You