GE VERNOVA

SMALLWORLD GEO NETWORK MANAGEMENT

Roadmap, Research & Development

Colin Lupton

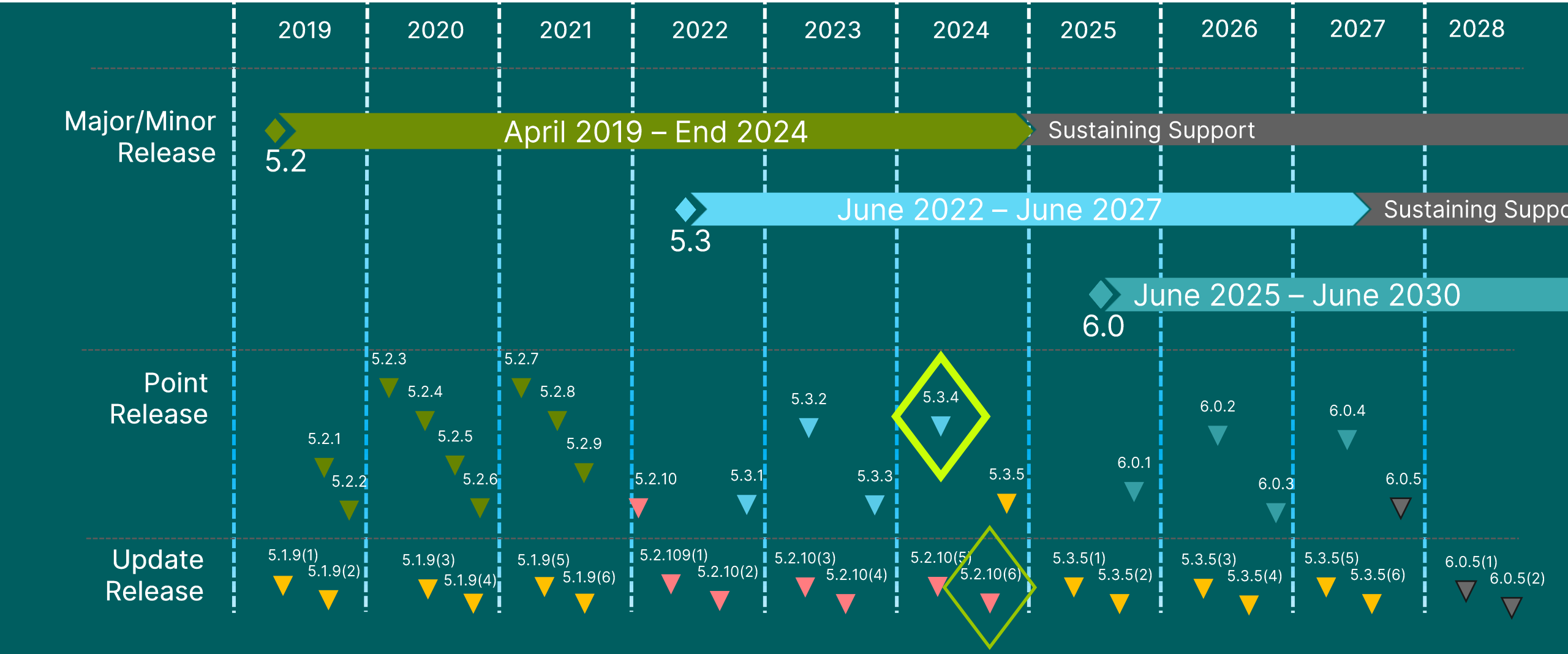
September 2024

© 2024 GE Vernova and/or its affiliates. All rights reserved.

ORCHESTRATE 2024
GridOS® Customer Conference

Smallworld Geo Network Management | Release & Support Schedule

GE VERNOVA



© 2024 GE Vernova and/or its affiliates. All rights reserved.

Smallworld Core 5.3.0 to 5.3.4 recap

GE VERNOVA

5.3.0
June 2022

Smallworld VMDS
- SWMFS Encryption
- SWMFS High Availability (HA) for Azure and AWS

Smallworld Core
- Bing Maps Adapter
- Raster SOMS Scalability

5.3.1
December 2022

Smallworld Core
- Construction Pack & Plotting Apps formatting enhancements
- Layout Designer – hyperlinks in PDFs
- Import / export user settings

Design Manager
- Design costing enhancements

5.3.2
June 2023

Smallworld VMDS
- SWMFS Security on Linux certificate improvements
- Extended Client Authorisation files
- SWMFS logging in JSON format

Design Manager
- Reorganisation of DM modules – supporting custom user applications

5.3.3
December 2023

Smallworld VMDS
- Mutual Transport Layer Security (mTLS) *evaluation*

Smallworld Core
- Desktop authentication via SAML

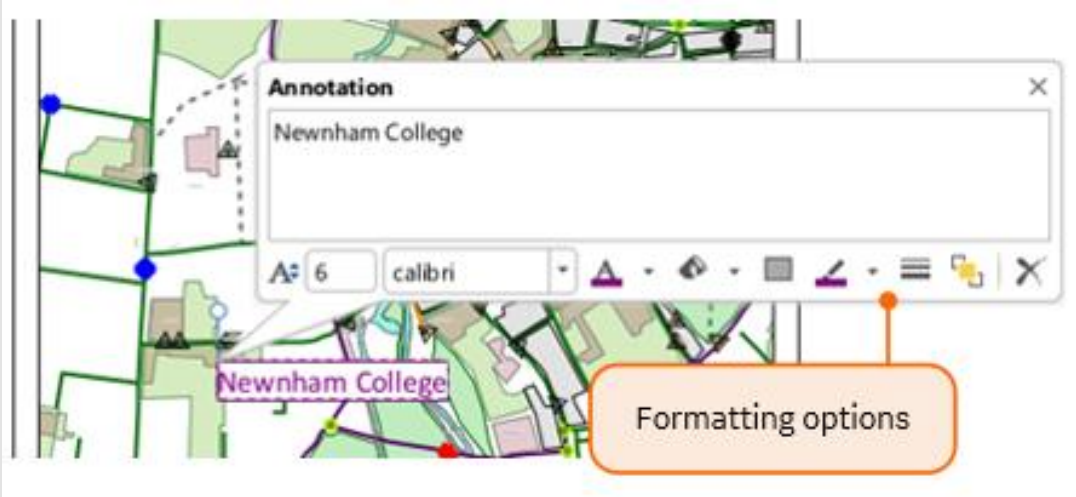
Smallworld Core 5.3.0 to 5.3.4 recap
Plotting and Layout Designer

GE VERNOVA

New features for managing user-added elements on plot pages:

- Extended text formatting in callouts
- Rotate elements by preset angles (45º, 90º, etc.)
- Copy & Paste elements between pages
- Add images by pasting from the Windows clipboard

- ✓ Clear construction instructions using formatted annotations
- ✓ Efficiently add images from Windows applications (productivity gain)



Smallworld Core 5.3.0 to 5.3.4 recap
Layout Designer

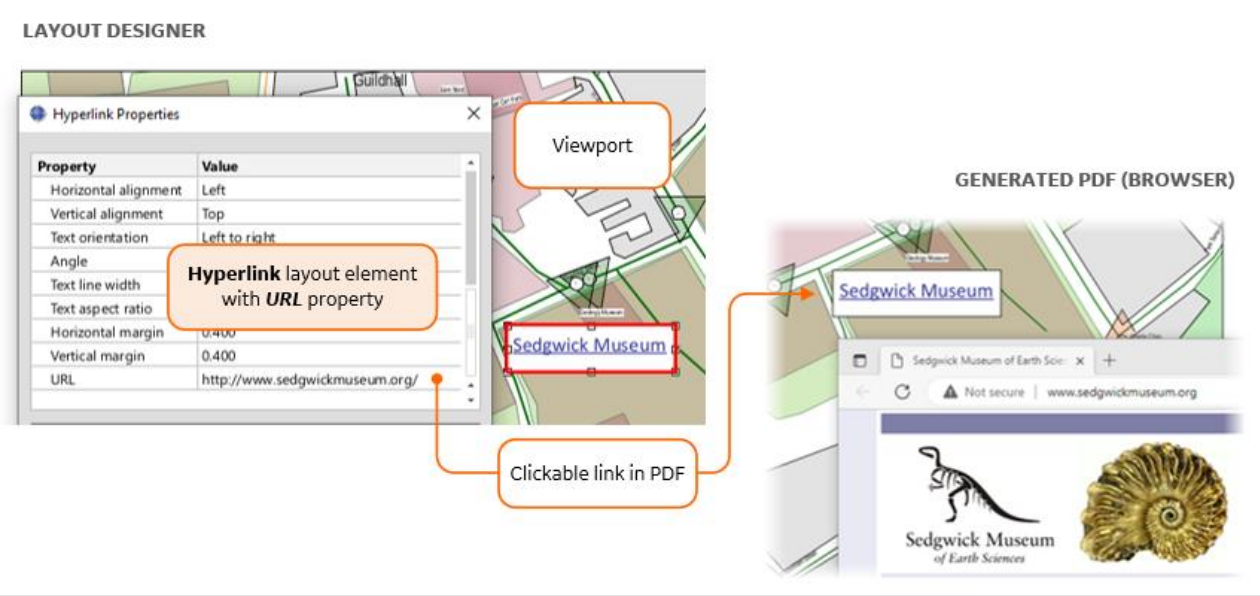
GE VERNOVA

Hyperlink layout element

New element to add hyperlinks to a layout template

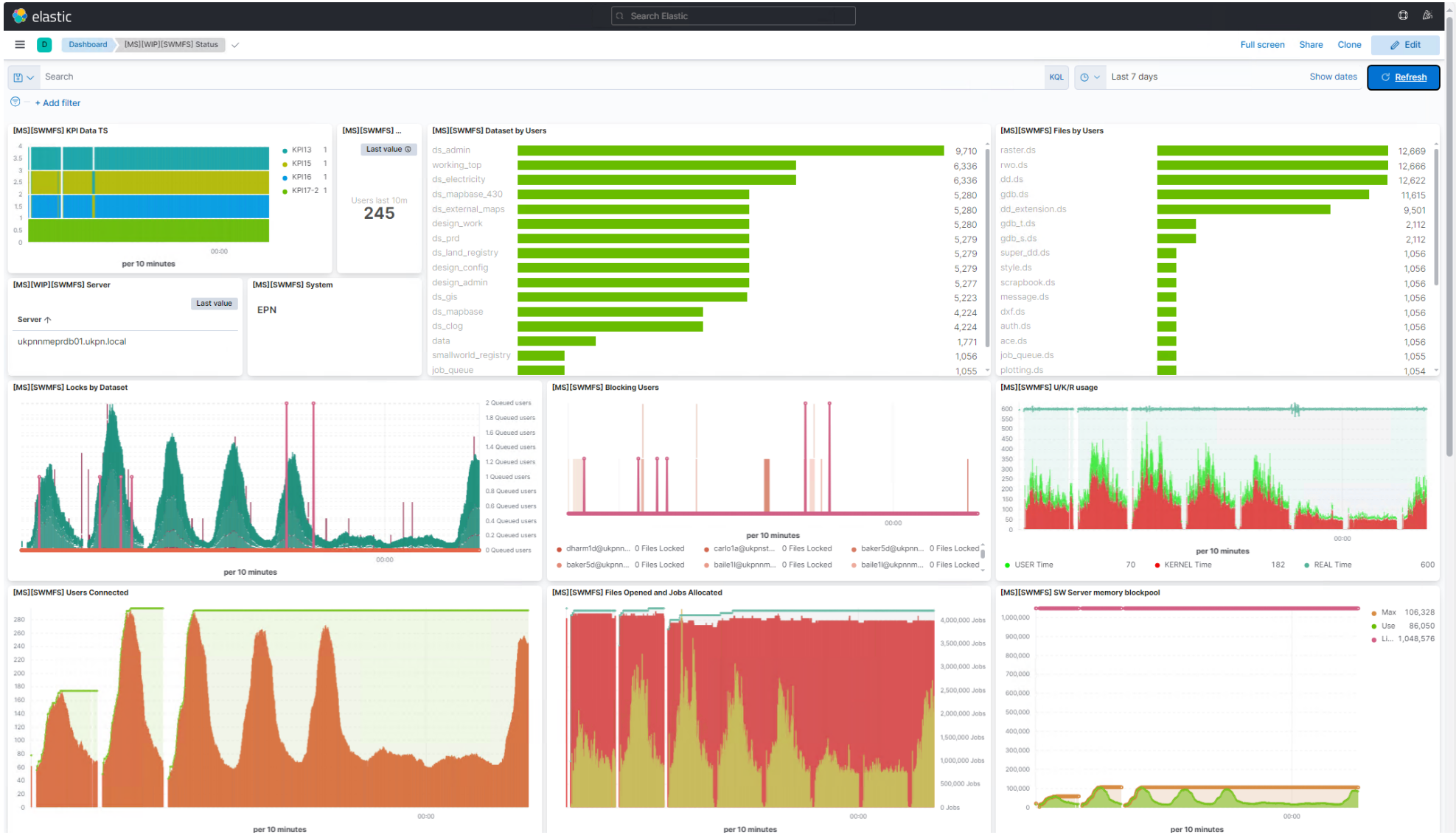
When a user opens a PDF generated from this layout, they can select the hyperlink to go to the URL specified in the layout element.

- ✓ Enables PDF users to refer to standard documents such as company work instructions



Smallworld Core 5.3.0 to 5.3.4 recap
SWMFS logging in JSON format

GE VERNOVA



Smallworld GNM | Technologie Themen 2024

GE VERNOVA

Sicherheit, Wartung & Cloud

- Verbesserte SWMFS-Sicherheit (mTLS)
- SAML-Authentifizierung Erweiterungen für die Abfrage von Benutzern
- Helm basierte Verteilung

Database Evolution

VMDS *Cloud* PostgreSQL Option

- Evaluierungs-/Demo-Version
  Ziel Q4 2024
- Produktionsfreigabe
  Ziel Q2 2025

Mainstream-Technologie

Smallworld DNA *Forschung*

- Server-Geschäftslogik in anderen gängigen Sprachen zusätzlich zu MAGIK

Mapbox Vector Tiles (MVT) Kachelung und GeoPackage

- Offline Verfügbarkeit für Außendienst Anwendungen

© 2024 GE Vernova and/or its affiliates. All rights reserved.

VMDS und VMDS cloud

GE VERNOVA

VMDS – Version Managed Datastore

Wesentlicher Beitrag zum Erfolg von Smallworld als skalierbarste Plattform zur geografischen/räumlichen Dokumentation und Planung komplexer Netze

- Seit mehr als 30 Jahren stabile Grundlage für Smallworld Produkte, kontinuierlich verbessert in Leistung, Sicherheit und Verteilung
- Einzigartige Versionsverwaltung ermöglicht es 1000+ gleichzeitigen Benutzern, räumliche Aktualisierungen durchzuführen und Konflikte zu lösen

VMDS cloud (vmSQL)

Fortsetzung der bisherigen Qualitäten und Fähigkeiten unter Nutzung einer relationalen Datenbank nach Industriestandard. GE erstes Zielsystem ist PostgreSQL.

- Wechsel von proprietär zu Industriestandard
- IT-Bereitstellung und -Verwaltung, einschließlich Hochverfügbarkeit (HA) und Desaster Recovery (DR)
- Beschleunigter Übergang in die Cloud
- Verwaltete Datenbanken von mehreren Anbietern als Service verfügbar
- Innovation durch offenen Datenzugang
- VMDS-Cloud ist eine Schlüsselkomponente für GridOS Data Fabric von GE

© 2024 GE Vernova and/or its affiliates. All rights reserved.

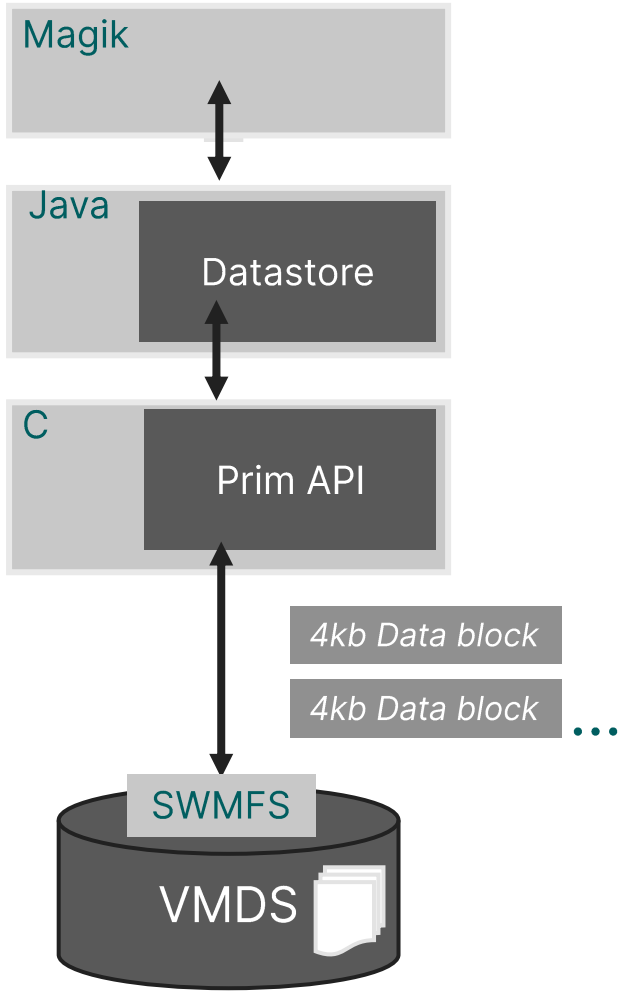
VMDS to VMDS Cloud

GE VERNOVA

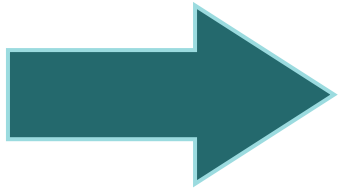
Application

Database access

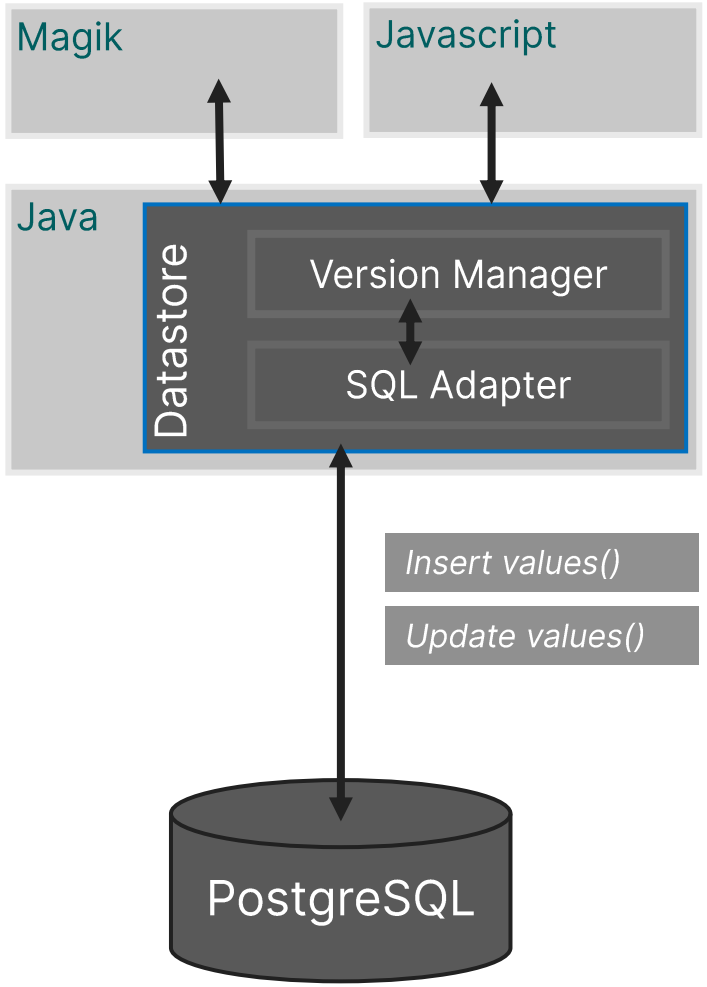
Persistence



- Lift & Shift VMDS relational model into PostgreSQL with version indexing
- Replace block persistence with record persistence



- Transparent data access from Magik and Typescript/Javascript
- Replace SWMFS user connection and rights management



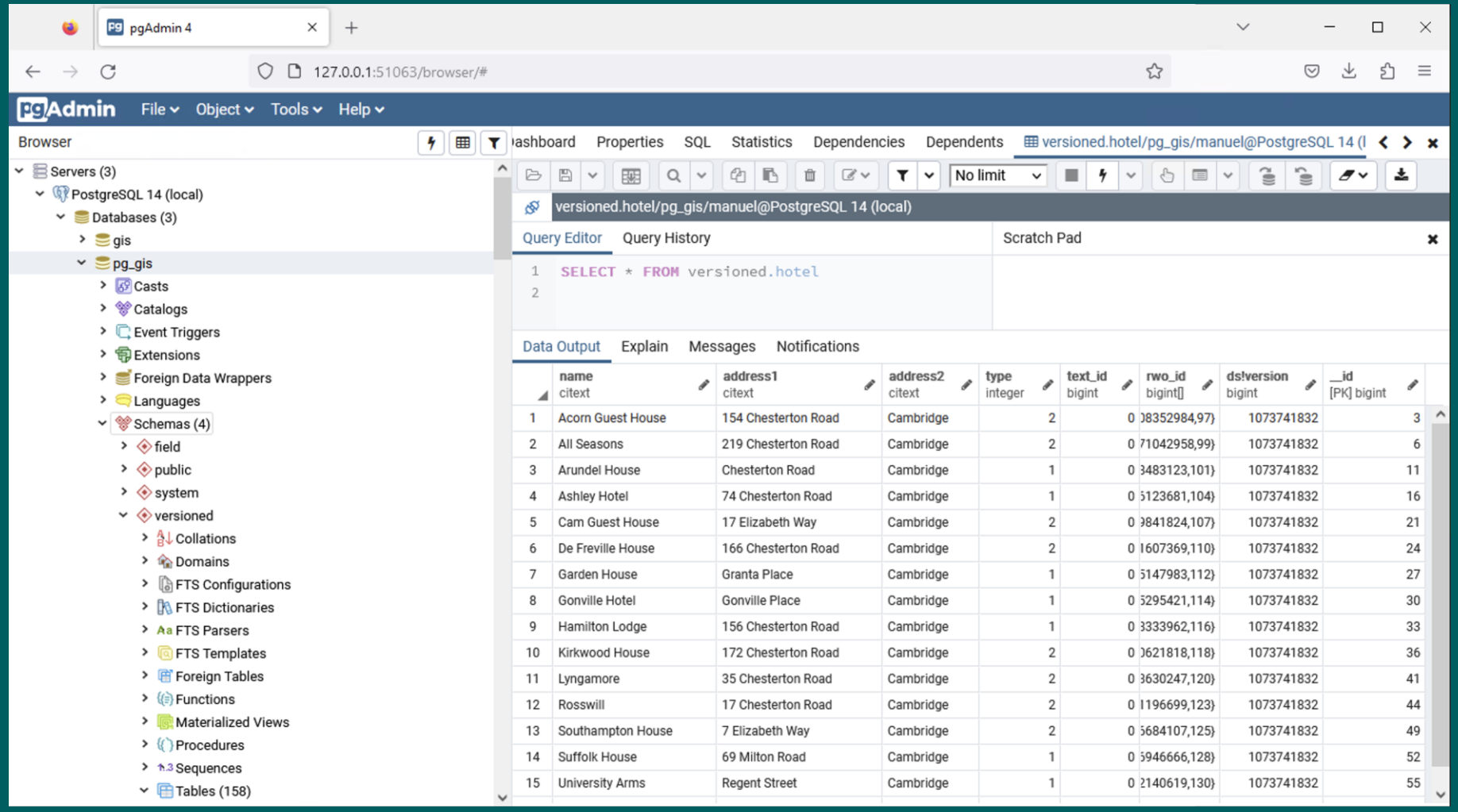
© 2024 GE Vernova and/or its affiliates. All rights reserved.

VMDS cloud | CamDB dataset

GE VERNOVA

PostgreSQL Schema

- Migriertes SW (CamDB) Schema
- *Direkt von GIS übernommen*
- *Nutzung aller SW Datentypen*
- *Versionsverwaltung*



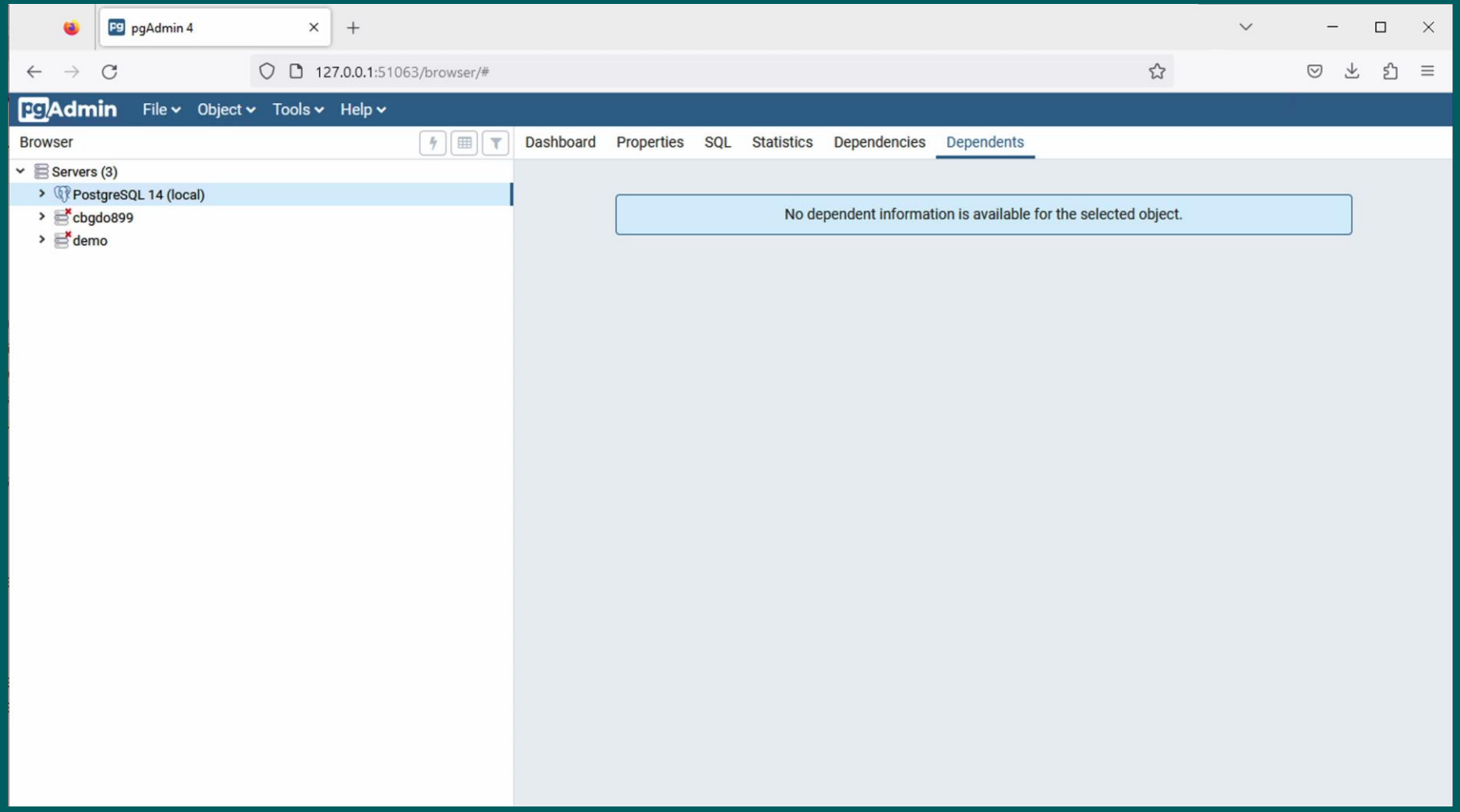
© 2024 GE Vernova and/or its affiliates. All rights reserved.

VMDS cloud | CamDB dataset

GE VERNOVA

PostgreSQL Schema

- Migriertes SW (CamDB) Schema
- *Direkt von GIS übernommen*
- *Nutzung aller SW Datentypen*
- *Versionsverwaltung*



© 2024 GE Vernova and/or its affiliates. All rights reserved.

VMDS cloud | vmsql dataset

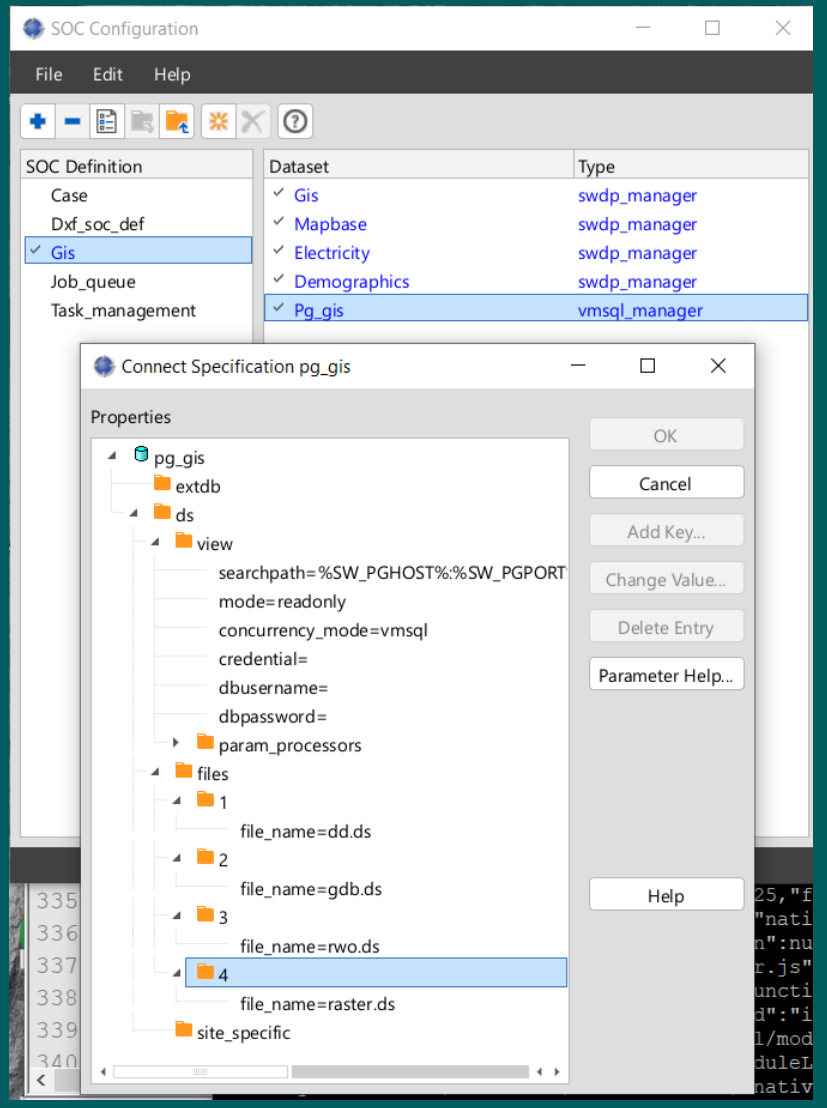
GE VERNOVA

Datensatz Spezifikation

Neue *vmsql_manager* Klasse zur Behandlung von PostgreSQL basierten Datensätzen

Zusätzlich zum bisherigen *swdp_manager für VMDS basierte Datensätze*

Concurrency mode namens :vmsql - spezifisch für PostgreSQL



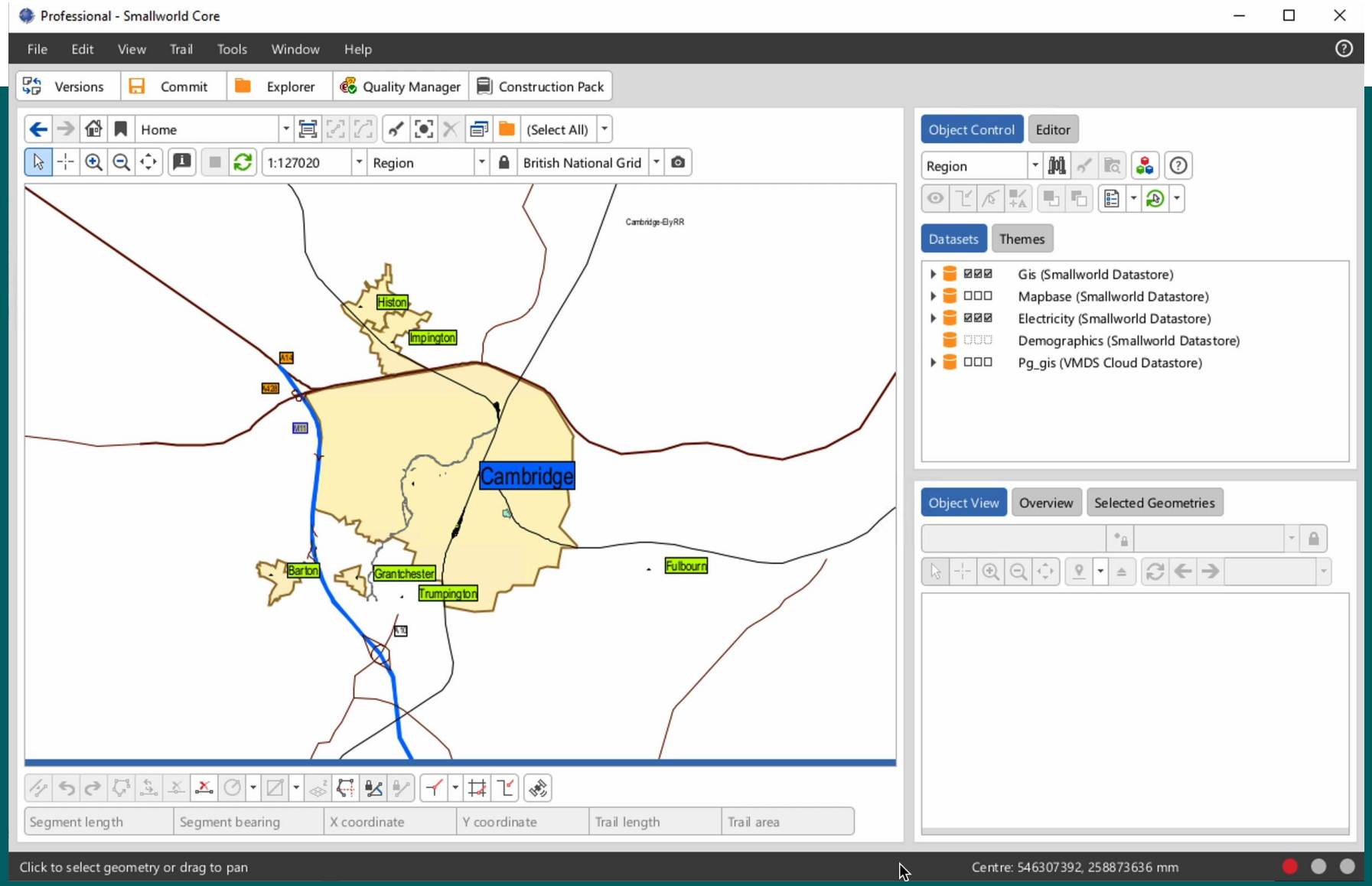
VMDS cloud | CamDB dataset

Datenzugriff

1:1 Funktionalität

Geometriefunktionen

Versionsverwaltung



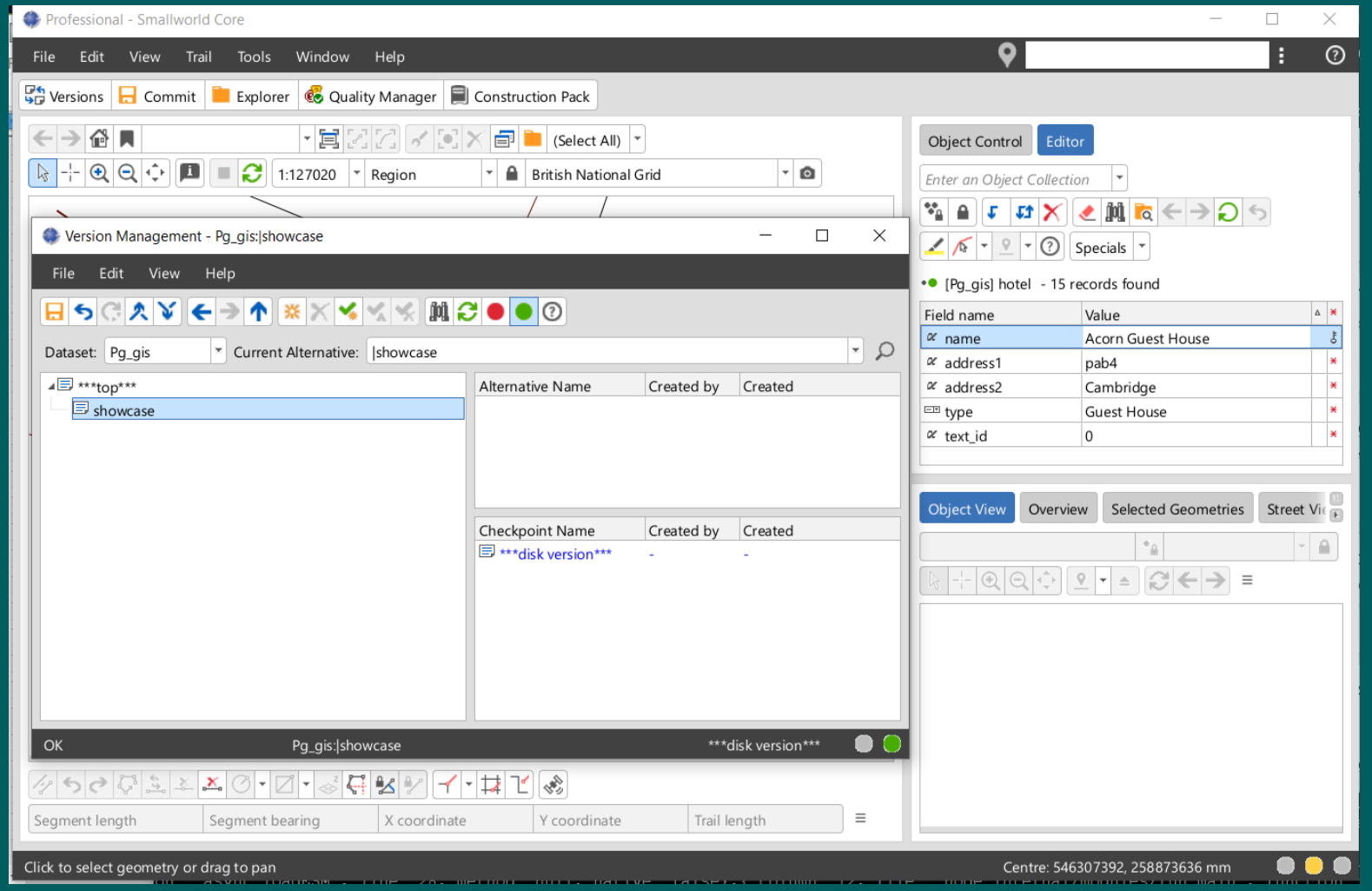
© 2024 GE Vernova and/or its affiliates. All rights reserved.

VMDS cloud | CamDB dataset

Versionsverwaltung

Smallworld-Versionsstruktur mit PostgreSQL verfügbar (Alternativen, Checkpoints)

Schlüsselkomponente für gute Skalierbarkeit aktueller VMDS Installationen, mit Unterstützung von > 1000 gleichzeitigen Benutzern



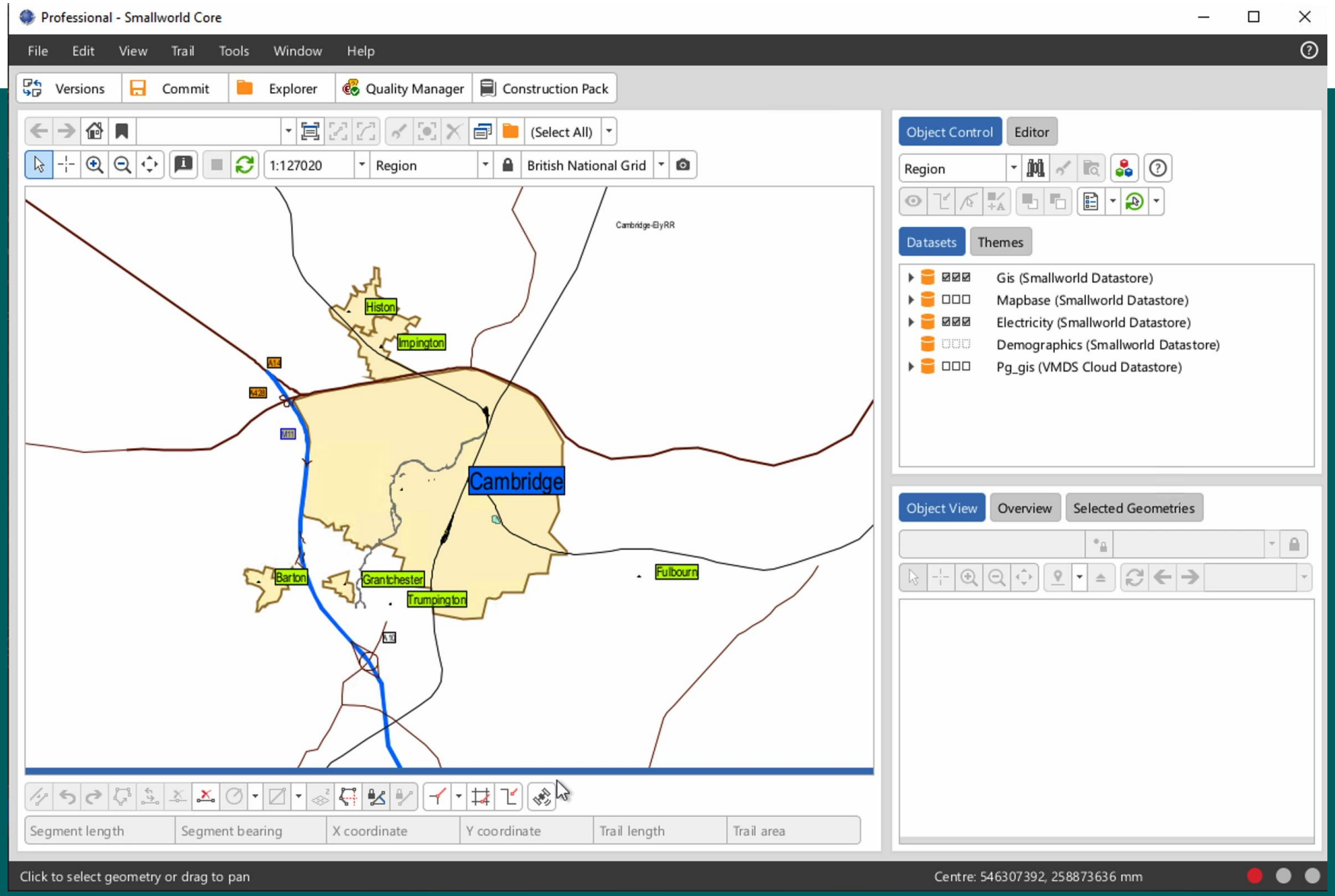
© 2024 GE Vernova and/or its affiliates. All rights reserved.

VMDS cloud | CamDB dataset

Versionsverwaltung

Smallworld-Versionsstruktur mit PostgreSQL verfügbar (Alternativen, Checkpoints)

Schlüsselkomponente für gute Skalierbarkeit aktueller VMDS Installationen, mit Unterstützung von > 1000 gleichzeitigen Benutzern



© 2024 GE Vernova and/or its affiliates. All rights reserved.

VMDS Cloud angestrebtes Ergebnis

- Transparent, keine Auswirkung auf Magik Anwendungen
- Verfügbarkeit als on-premise oder cloud (hosted, managed servides)
- Standard Administration, Skalierbarkeit, Replikation, Hochverfügbarkeit und Redundanz
- Bewahrung der gewohnten Skalierbarkeit von Smallworld

- **Sicherer** Datenzugriff auf Smallworld Daten (Datenpipeline)
- Direkter Zugriff von **Javascript** Anwendungen
- **Restful API** nutzt Smallworld Versionen
- Bereitstellung als Teil **von GridOS Data Fabric** oder eigenständig
- **Option** für Smallworld 5.3 LTS (*VMDS and VMDS Cloud koexistieren*)

GE VERNOVA

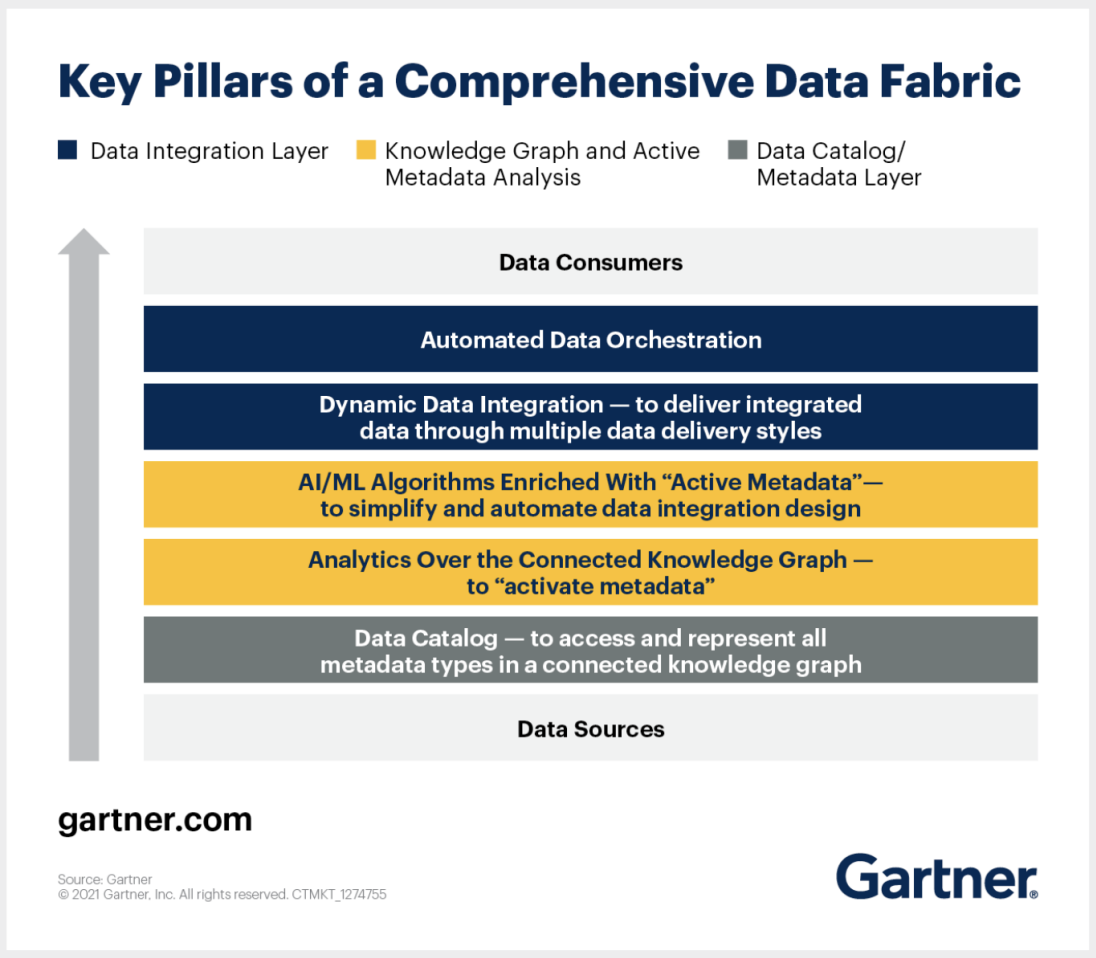
GE VERNOVA

GRIDOS DATA PRODUCTS

© 2024 GE Vernova and/or its affiliates. All rights reserved.

ORCHESTRATE 2024
GridOS Customer Conference

Data fabric is the key to DataOps



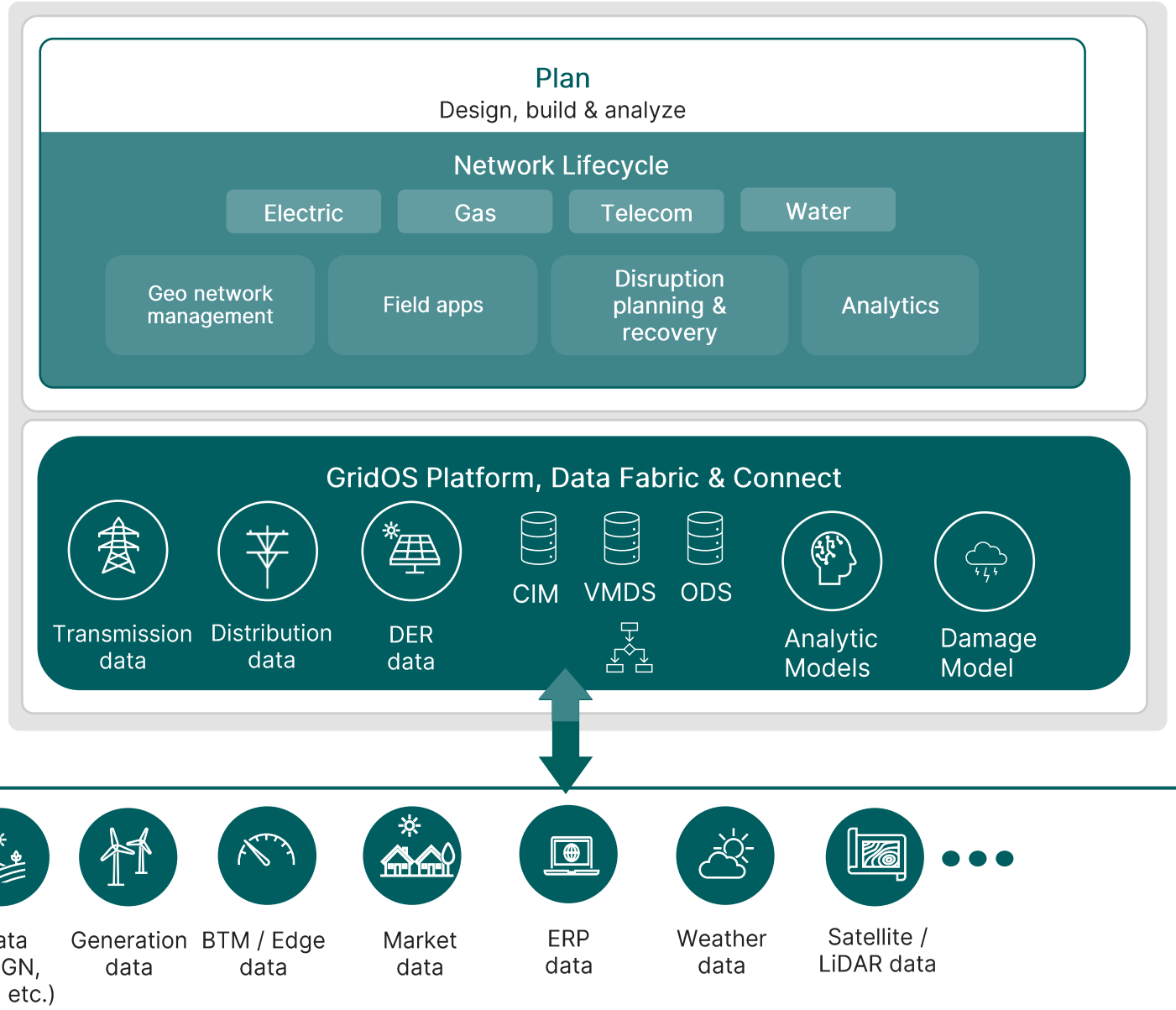
Gartner's Key Components

1. **Augmented Metadata Catalog**
   Search engine for data and data products, facilitates discovery and sharing
2. **Enriched Knowledge Graph**
   Catalog entries with lineage, active metadata such as recency, markdown notes, glossaries, custom properties, tags, etc.
3. **Data Preparation**
   Provides a self-service UI for building curated datasets, data exploration, visualizations, etc.
4. **Data Delivery**
   Makes data available via a wide range of technologies with appropriate constraints
5. **Data Orchestration**
   Automatically create, deploy, and maintain resilient integrations based on metadata in the catalog

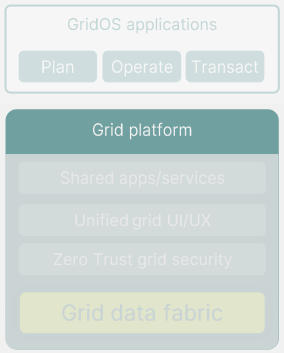
© 2024 GE Vernova and/or its affiliates. All rights reserved.

Smallworld Geo Network Management

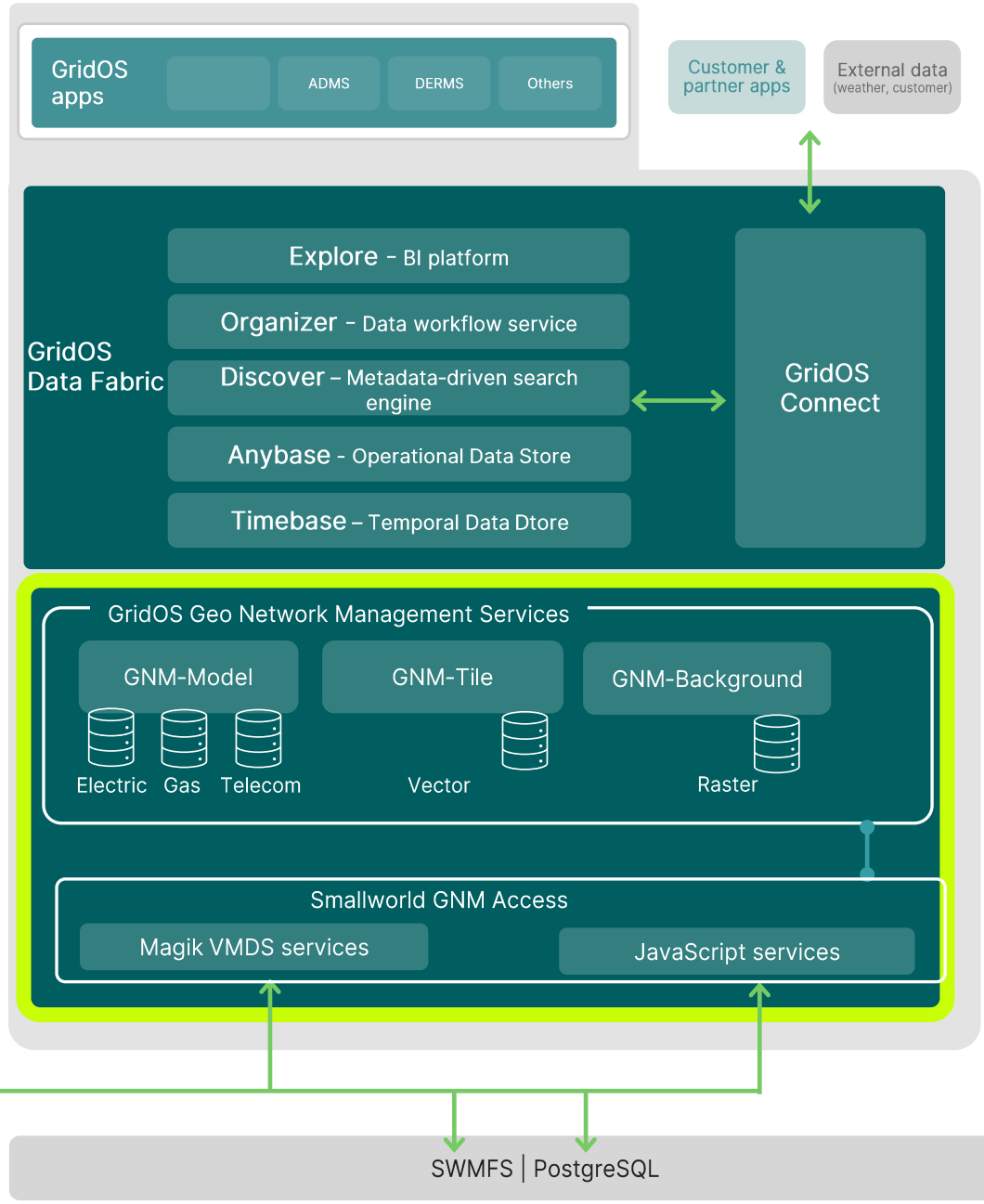
- Geografisches Netzmodell Schlüsselkomponente für GridOS Data Fabric
  - Dokumentation von physischer/logischer Struktur des Ist-Zustandes
  - Planung (Design) Netzausbau/-umbau
  - Qualitässicherung / Datenaktualisierung
  - CIM Modell Orchestrierung und Versionsverwaltet



GridOS®
Orchestration Software



Smallworld GNM



GE VERNOVA

GridOS® GNM Services

What is it?

The data & services that constitute the data products for the geospatial network for utility and telecom infrastructure.

Benefits

Provides GridOS Data Fabric with data sources for describing the base (“normal”) networks and their geospatial and schematic representations.

GNM Services are GIS agnostic and uses open standard representations of its data to maximise its reuse across the data fabric and GridOS Apps.

GNM-Model (GNM-E, GNM-G, GNM-T)

- Relational models of domain networks

GNM-Tile

- Vector Tile service with feature attributes

GNM-Background

- Raster (Image) background data

© 2024 GE Vernova and/or its affiliates. All rights reserved.

GE VERNOVA

GRIDOS PLAN APPS

© 2024 GE Vernova and/or its affiliates. All rights reserved.

ORCHESTRATE 2024
GridOS Customer Conference

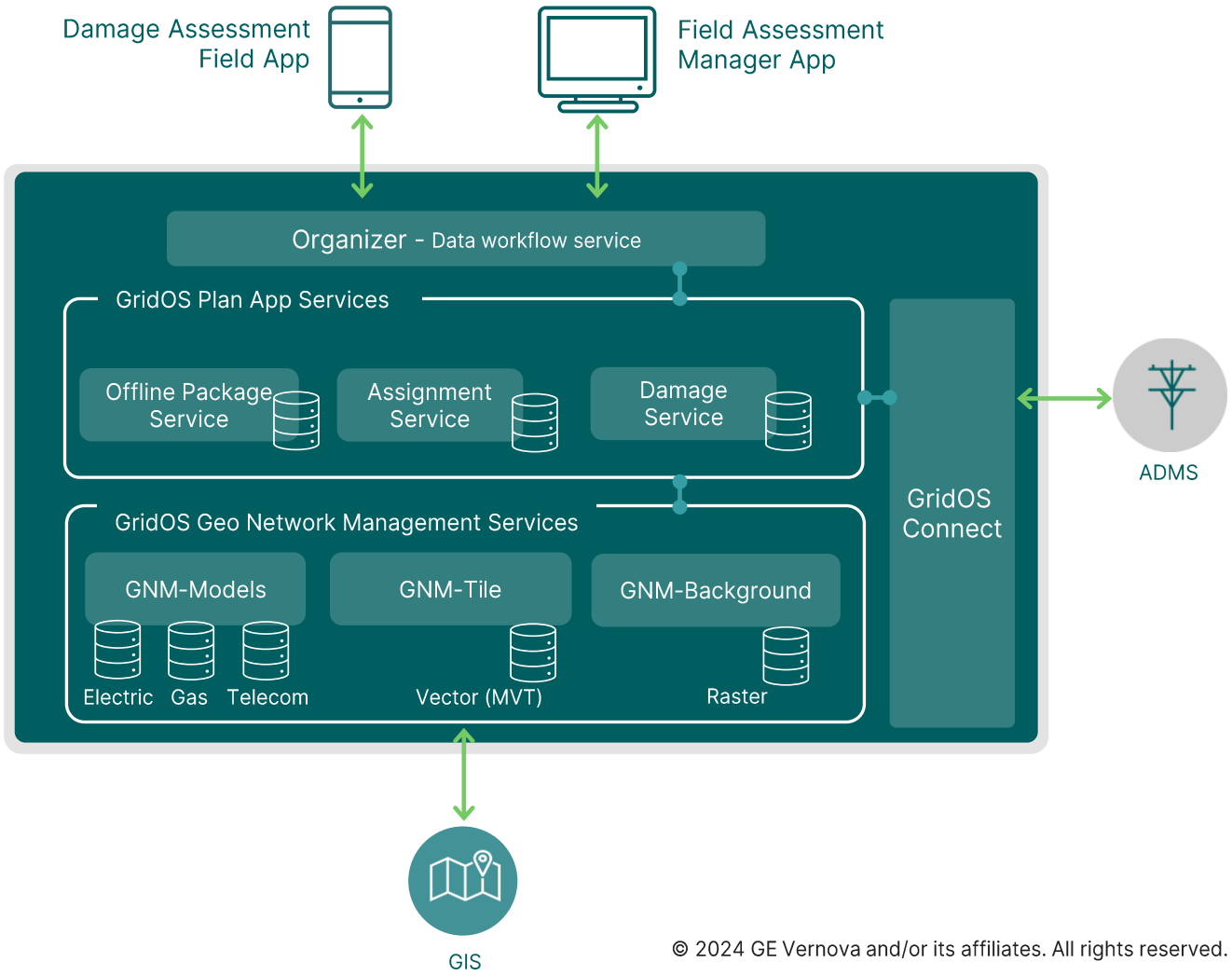
GridOS®
Orchestration Software

GE VERNOVA

GridOS applications
Plan | Operate | Transact

GridOS apps

GridOS Data Fabric



© 2024 GE Vernova and/or its affiliates. All rights reserved.

GridOS® Plan Apps

What is it?

Workflow and data oriented apps with corresponding reusable app services.

Geo Network Management data products that provide common domain models (GNM-Electric, GNM-Gas, GNM-Telecom)

Benefits

Composable app services backed by data products for building multiple GridOS apps in data fabric

Damage Assessment example solution comprises a work assignment web application and an offline capable app for Damage Assessors recording network damage.

Using the data fabric it accesses both GIS network model (e.g. feeders) and crew and outage information from ADMS (for example) and packages them for offline use.

Smallworld Geo Network Management

GE VERNOVA

Smallworld-Anwendungen sind GridOS-kompatibel

Smallworld Core, Electric Office, NRM, PNI, Gas Office, Water Office … (5.3.x, 6)

- Bestehende Datenbanken und Datenmodelle werden in GridOS Data Fabric eingebracht
- GeoSpatial Analysis (GSA) greift weiterhin auf Smallworld zu und schafft Mehrwert für Smallworld
- GeoSpatial Server (GSS) stellt Dienste bereit; Verbindung mit GridOS und anderen Systemen
- Cloud Native Ready
- Kontinuierliche Investitionen in Smallworld-Technologie

Zusätzliche Anwendungen für Web und Mobile, Analysen auf der GridOS-Plattform
Mehrwert mit einheitlicher Benutzererfahrung

Smallworld GNM ist ein wichtiger Bestandteil des GridOS Portfolio

© 2024 GE Vernova and/or its affiliates. All rights reserved.