



Delve into a high availability, distributed FME Flow deployment solution

Date: 6th June 2024
Presenter: Rudolph Vogt
Where: FME Roadshow – Wellington, NZ



CITY OF MELBOURNE



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Background



35 years experience in Spatial and Information Technology



Studied Computer Science, Civil Engineering, Survey, Mathematics and Statistics



Immigrated from South Africa to Melbourne in May 2003



Started at City of Melbourne in March 2004

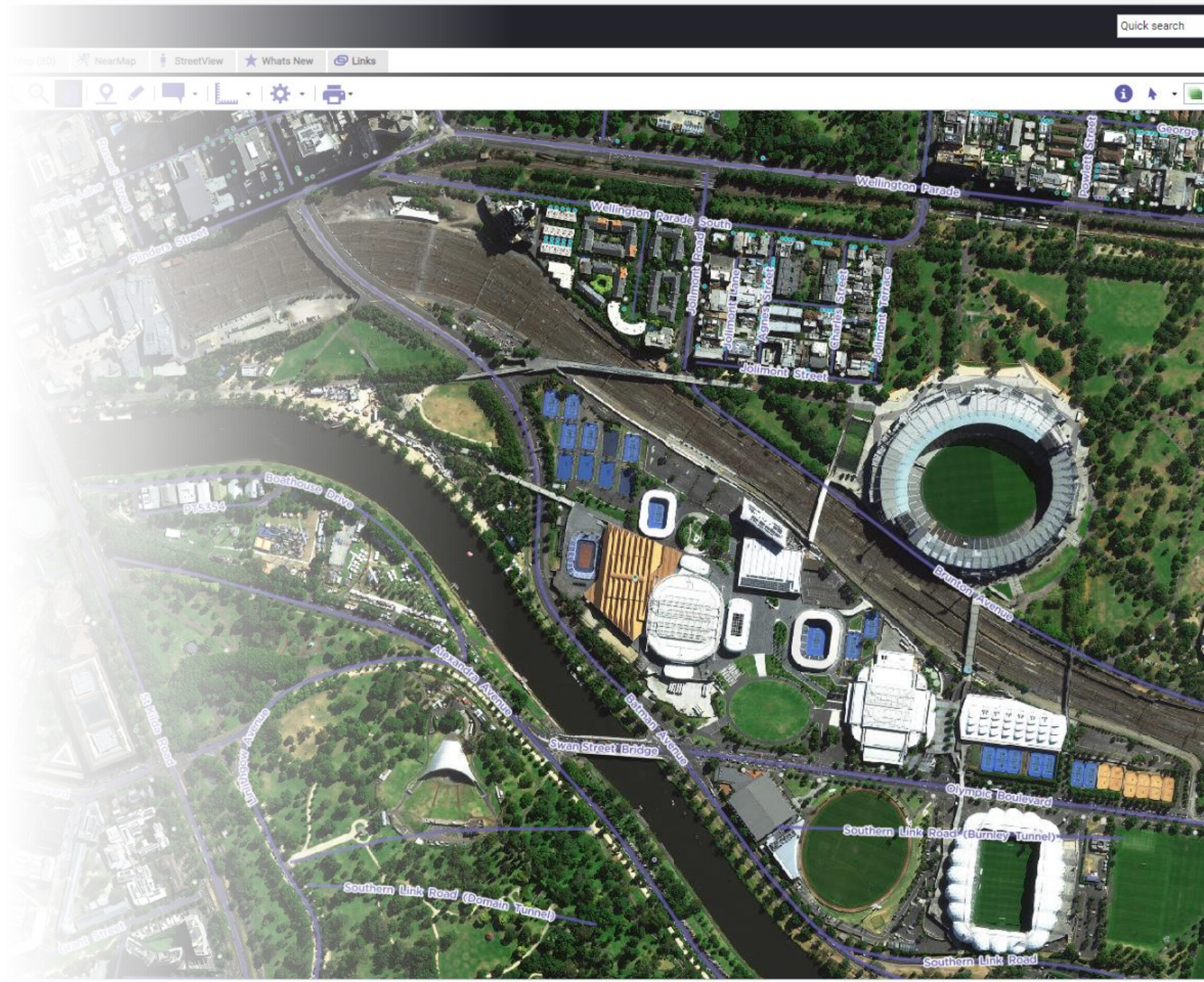


FME Form (formerly FME Desktop) – started in 2006 (MGA94 – AMG66)

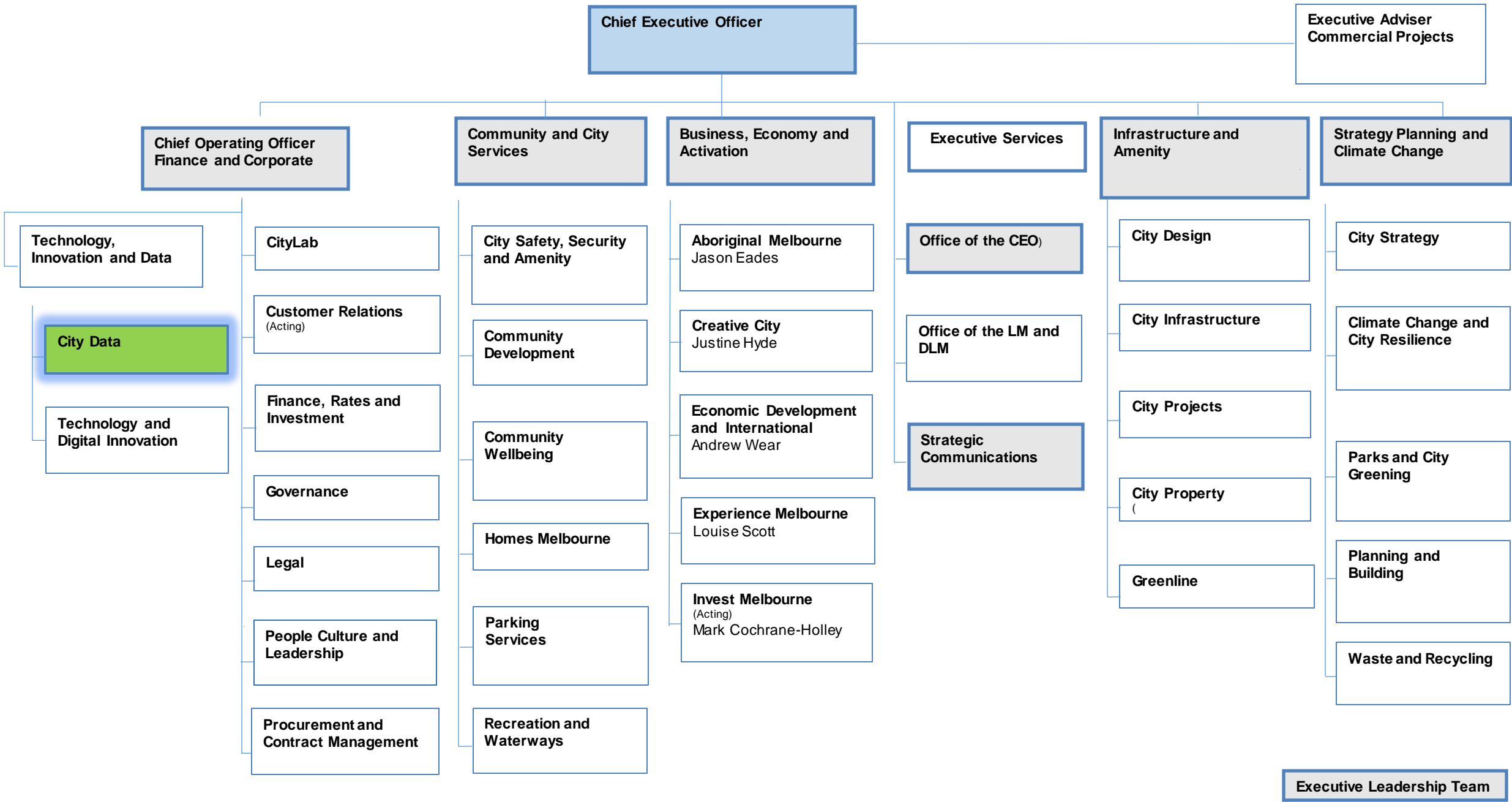


FME Flow (formerly FME Server) in 2011

- My Office



City of Melbourne Organisational Structure (as at 8 April 2024) - EXTERNAL



Spatial Team



- 1 x Licensed Surveyor**
- 2 x GIS Visual Product Designer**
- 2 x GIS Modelling Specialist**
- 2 x Spatial Property Specialist**
- 2 x Spatial Analyst / Developers**
- 3 x GIS System Specialist**
 - ArcGIS Enterprise / AGOL
 - FME Flow
 - SQL Server Database
 - Python
 - Windows Servers
 - Weave / Geoserver



Environment

ArcGIS Enterprise

- ArcGIS Server
- ArcGIS Portal
- Datastore
- ArcGIS Online

Network

- Reverse Proxies
- Netscaler – Load Balancer
- STZ – Semi Trusted Zone
- Azure Active Directory
- Windows Server 2019

FME Flow

- FME API – Application Integration
- Sales Force
- Sensor API
- FME Form License Manager

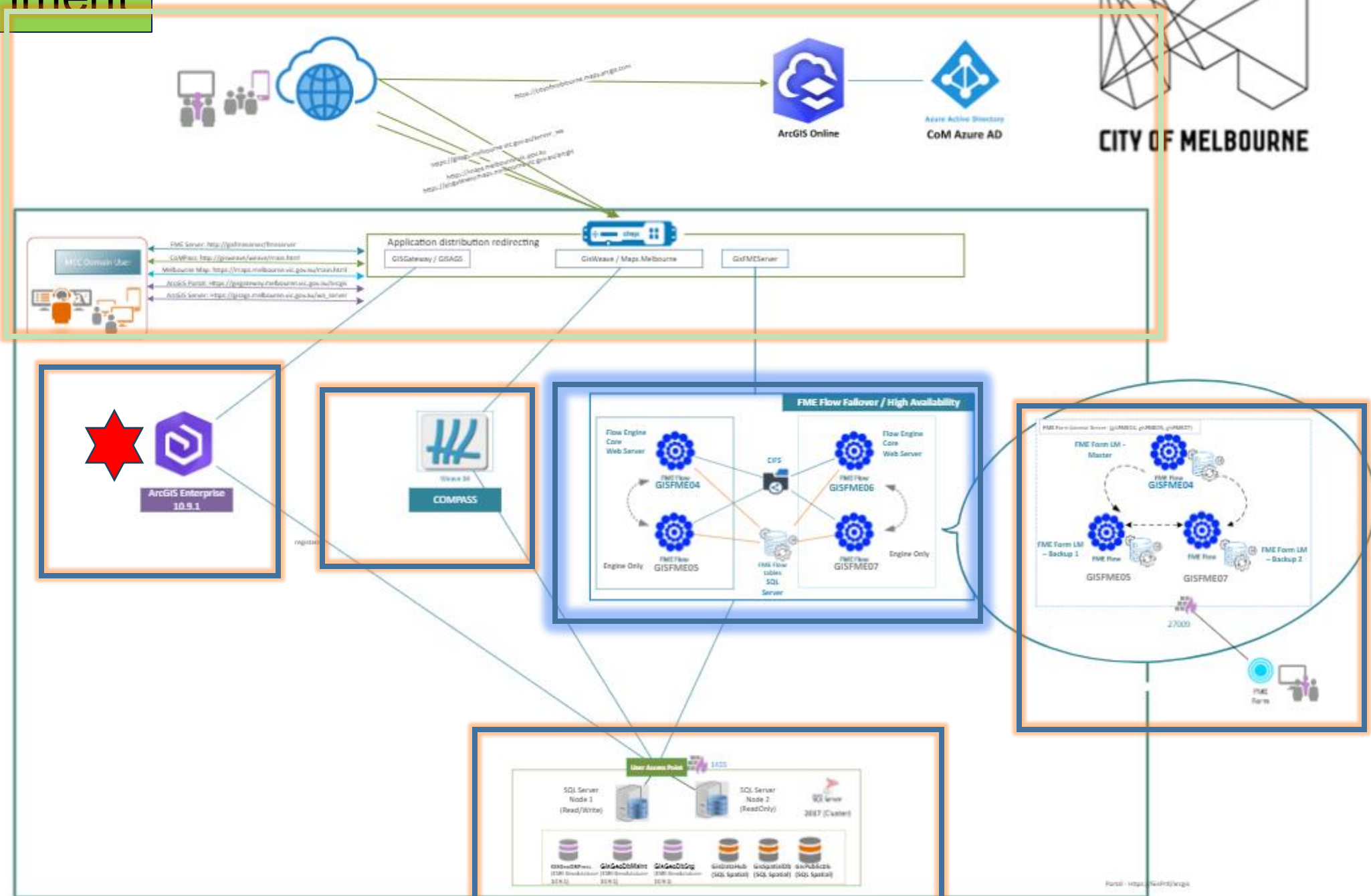
GIS Web Servers

- GeoServer
- Weave Framework

SQL Server Databases

- ESRI Geodatabase
- FME Flow Database
- SQL Server Integration Services

Environment



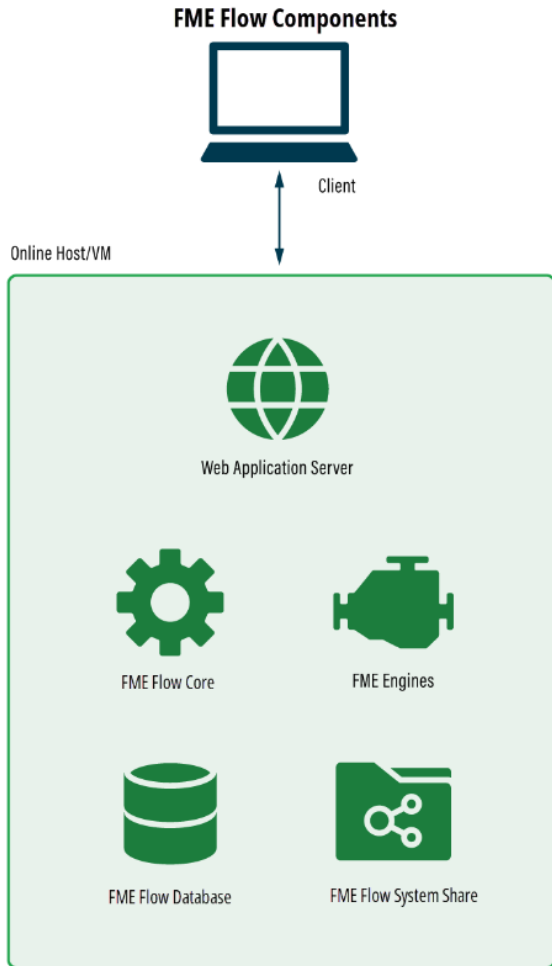
Problem Statement



People are less tolerant of system downtime

People are working flexible working hours

After hours / weekends are for fun – not upgrades



All on one Machine

- New version upgrade – System offline
- Security Update – System offline
- Time consuming for a version Upgrade
- If Engines / Core / Web Application fails – System Offline



Since 2018

- integration point was enable / expectations
- Sale Force
- Permit Application
- Internal GIS web Application
- FME API endpoints for Software Applications








Design for 24/7 uptime

- address single point of failure
- FME Flow (server) core
- Web Application Server
- FME Flow Database
- FME Flow System Share (CIFS)
- Engine only distribution

LEGEND

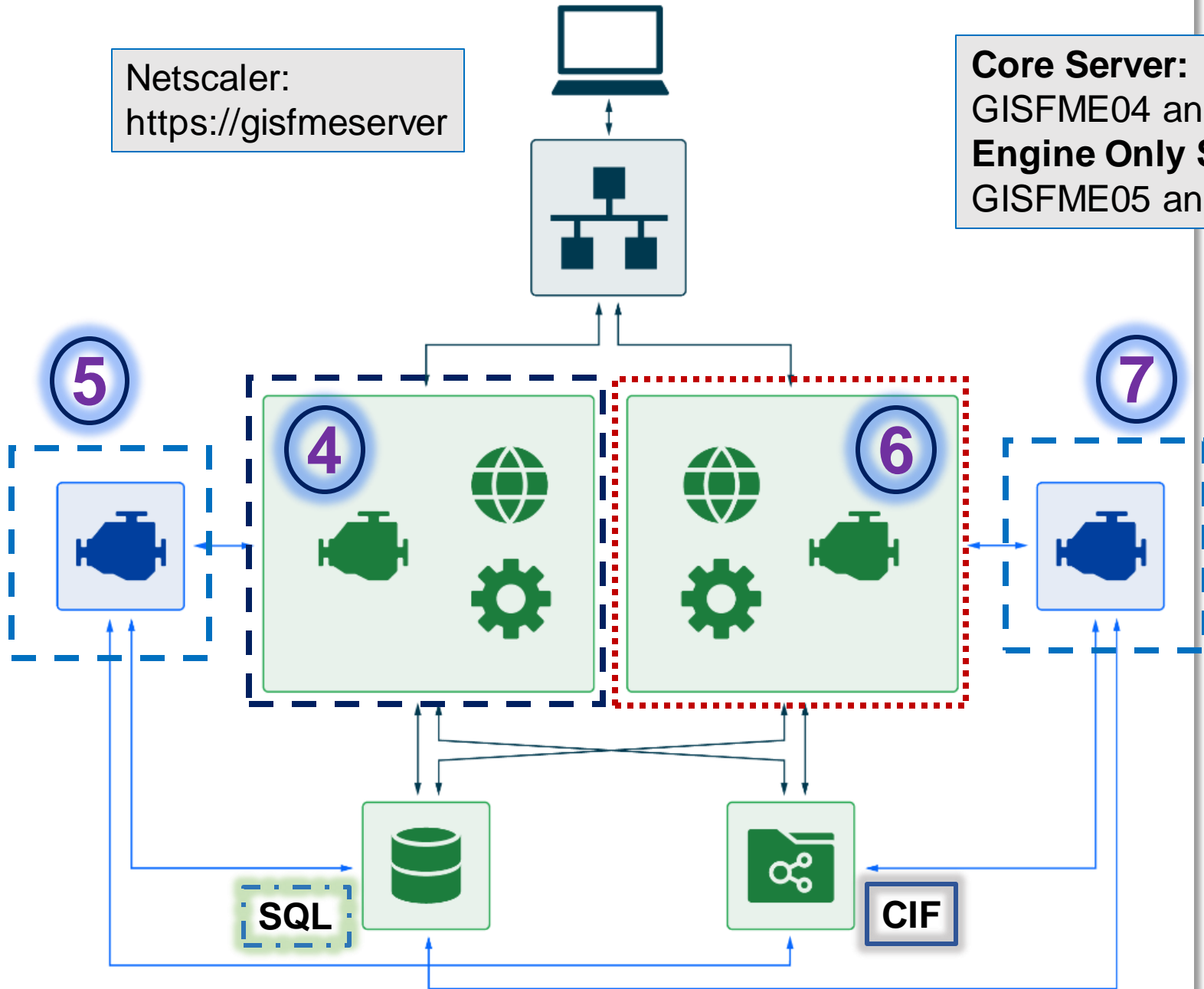
-  Client
-  Load Balancer

FME Flow Components



-  Web Application Server
-  FME Flow Core
-  FME Engines
-  FME Flow Database
-  FME Flow System Share
-  Online Host/VM
-  Optional Engines Host/VM

Netscaler:
<https://gismeserver>








Core Server:
GISFME04 and GISFME06
Engine Only Server
GISFME05 and GISFME07



LEGEND

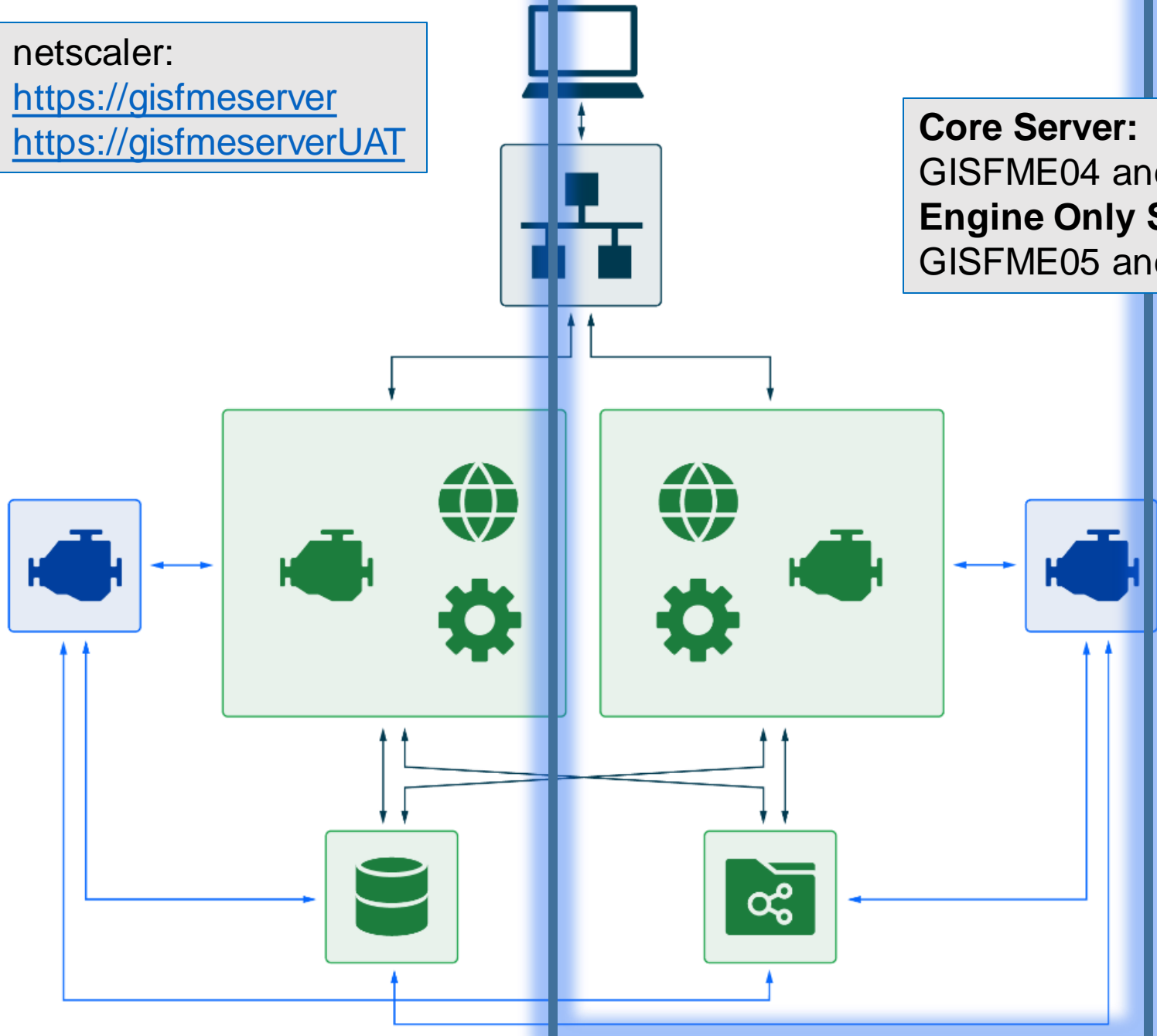
-  Client
-  Load Balancer

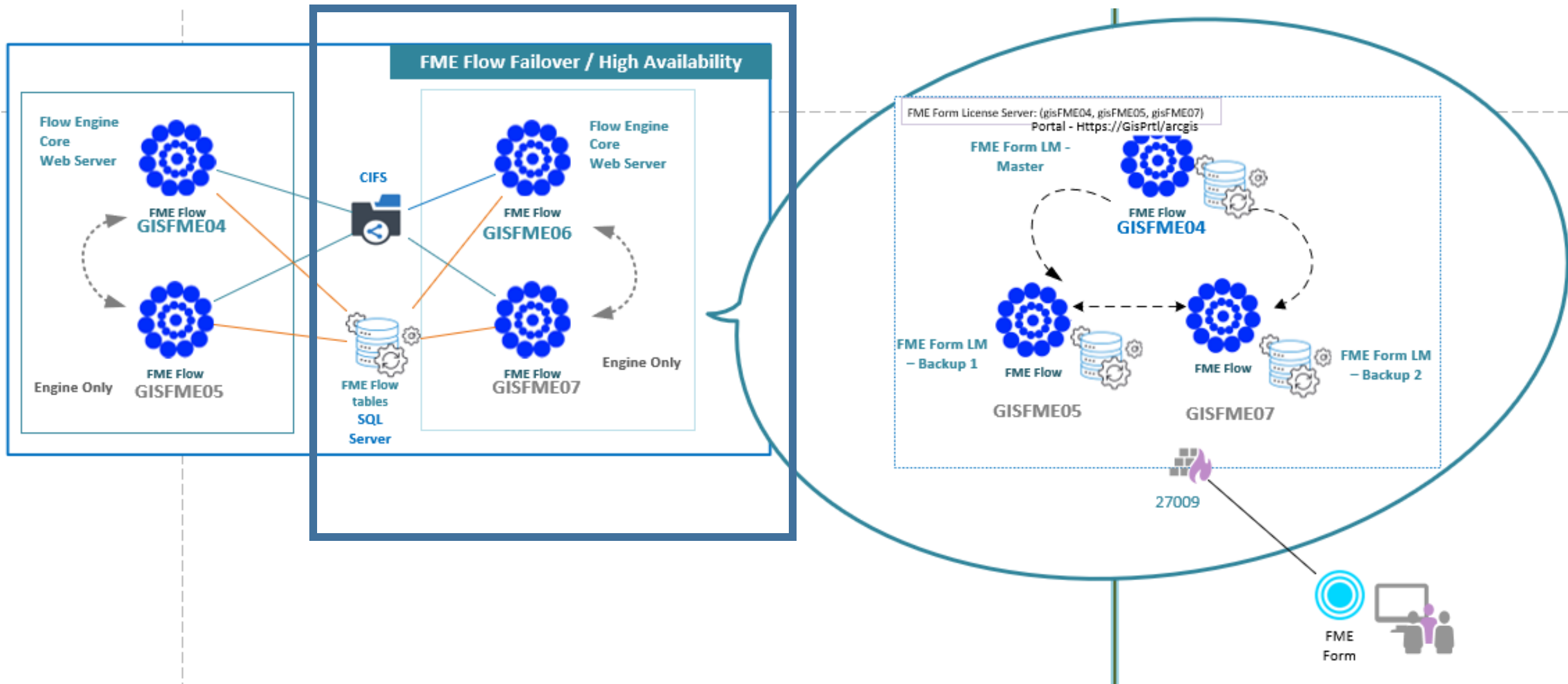
FME Flow Components

-  Web Application Server
-  FME Flow Core
-  FME Engines
-  FME Flow Database
-  FME Flow System Share
-  Online Host/VM
-  Optional Engines Host/VM

netscaler:
<https://gisfmeserver>
<https://gisfmeserverUAT>

Core Server:
GISFME04 and GISFME06
Engine Only Server
GISFME05 and GISFME07






<https://gisfmeserver.melbourne.vic.gov.au>

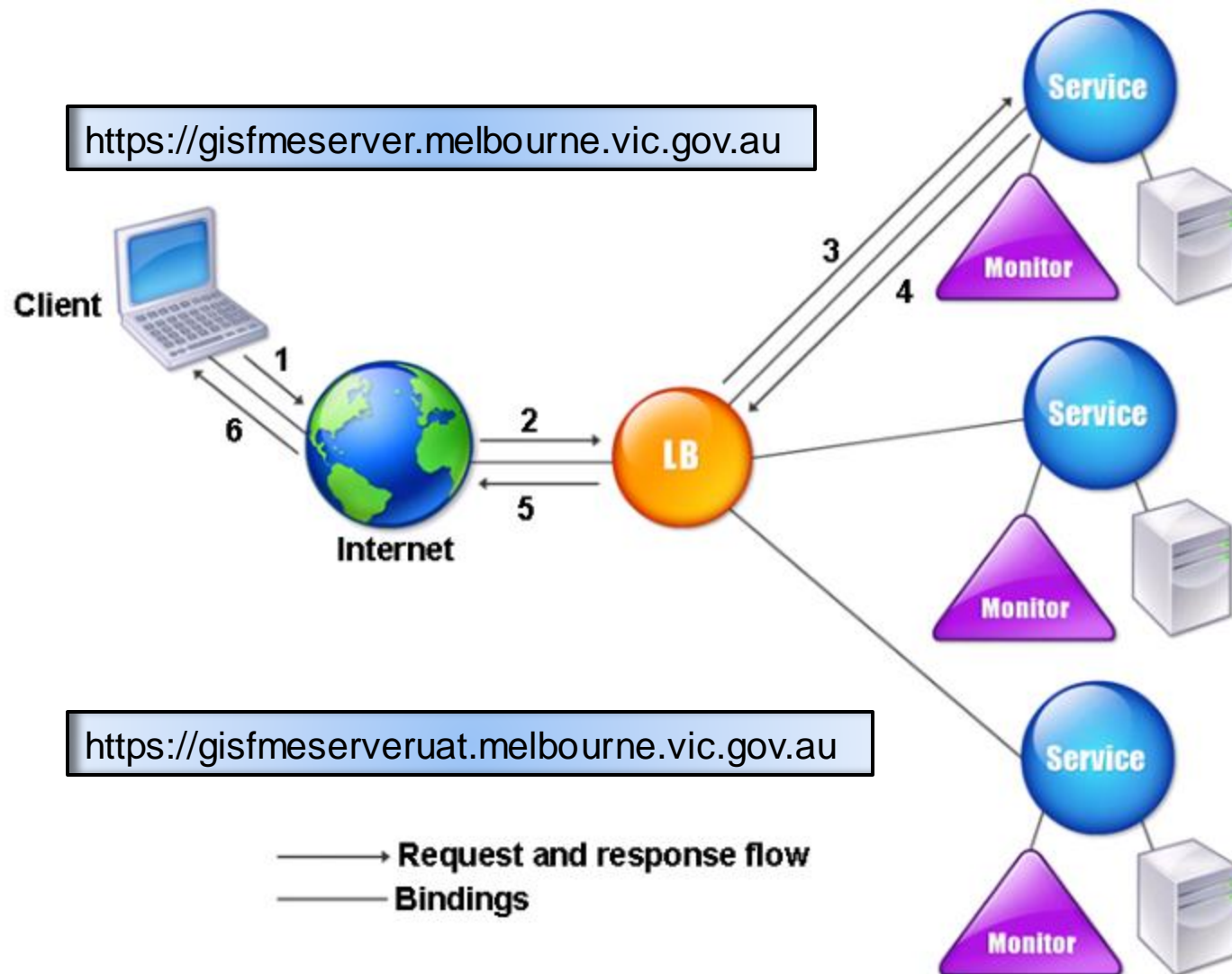


Service Group Members Binding ✕

| ▾

<input type="checkbox"/>	IP Address	Server Name	Port	Weight	Server Id	Hash Id	State	Service State
<input type="checkbox"/>	172.22.80.115	GISFME04	443	1	None	--	ENABLED	UP
<input type="checkbox"/>	172.22.80.116	GISFME05	443	1	None	--	DISABLED	OUT OF SERVICE
<input type="checkbox"/>	172.22.80.136	GISFME06	443	1	None	--	ENABLED	UP
<input type="checkbox"/>	172.22.80.137	GISFME07	443	1	None	--	DISABLED	OUT OF SERVICE





<https://gisfmeserver.melbourne.vic.gov.au>
 Port 443, IP Address

[GISFME05.melbourne.vic.gov.au](https://gisfmeserveruat.melbourne.vic.gov.au)
 Port 443, IP Address


[GISFME06.melbourne.vic.gov.au](https://gisfmeserveruat.melbourne.vic.gov.au)
 Port 443, IP Address

[GISFME07.melbourne.vic.gov.au](https://gisfmeserveruat.melbourne.vic.gov.au)
 Port 443, IP Address

- Videos
- Local Disk (C:)
- Data (D:)
- Apps
 - 7-Zip
 - ArcGis
 - FlexServer
 - FME2023.1
 - FME2024.0
 - Git
 - Microsoft SQL Server Management Studio 18
 - Microsoft SQL Server Management Studio 19
 - Microsoft VS Code
- Scripts
- SqlData
- Temp

FME Flow 2024.0.1 (Build 24202 - win64) Setup

Choose Setup Type

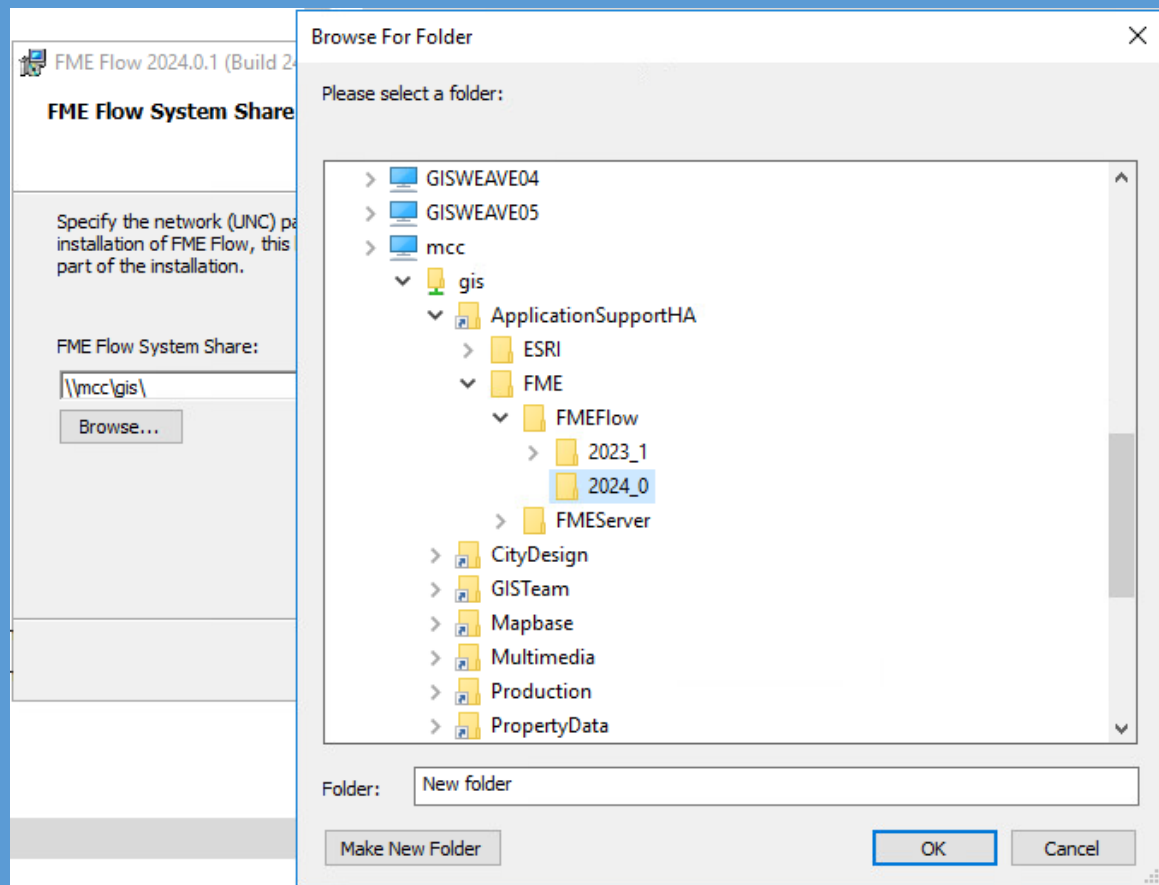
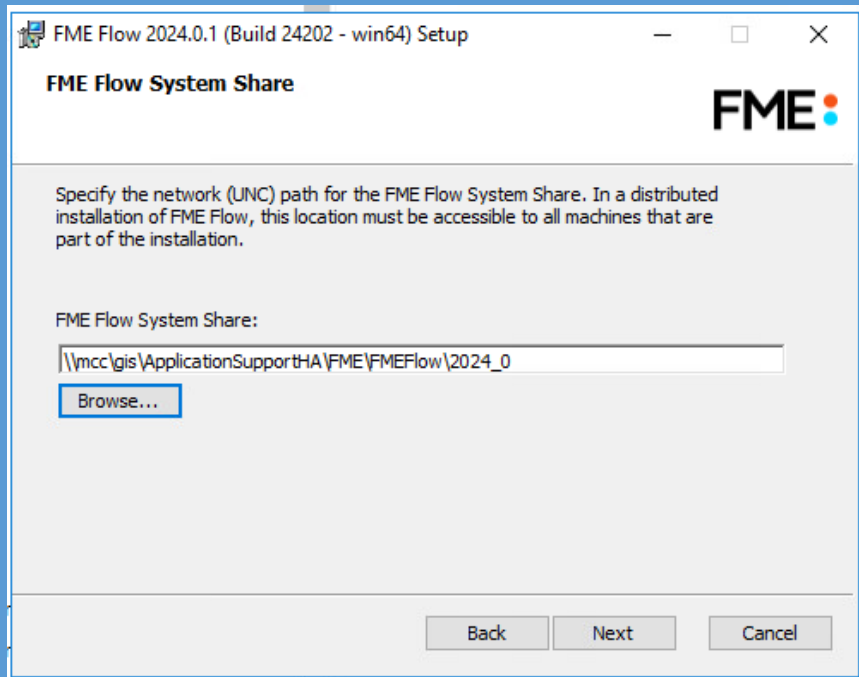


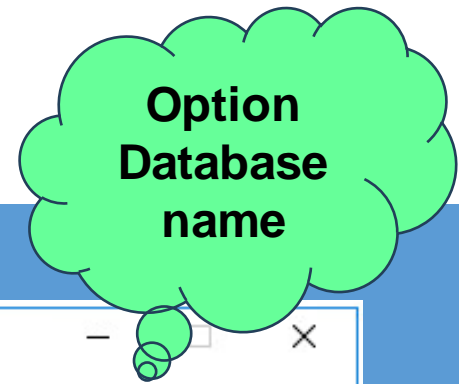
Please choose setup type.

- Express
Installs all required components, so you can get started quickly and easily with FME Flow. (Recommended)
- Distributed / Fault Tolerant
Provides flexibility over which FME Flow components to install. Select this option for certain fault-tolerance scenarios, or if your organization's IT constraints require you to use existing components for the FME Flow database or web application server.
- Distributed Engine
Allows you to build onto a current FME Flow installation by adding FME engines on a separate machine for fault tolerance and/or high capacity.

Click Next to continue.

Back Next Cancel





FME Flow 2024.0.1 (Build 24202 - win64) Setup

Database User

Set the username and password for the database user used by FME Flow

For FME Flow to run, a new user must be created for the chosen database. Please specify a name for this user (this will be added to a provided SQL script to run on your database). See [Configure the FME Flow Database on a Separate Database Server](#) for more details.

User Name:

Password:

Confirm Password:

Note: This password must adhere to the password complexity rules of the selected database type.

FME Flow 2024.0.1 (Build 24202 - win64) Setup

Database Server Parameters

Specify the Database Parameters.

Configure the MSSQL Connection: Specify JDBC Connection String

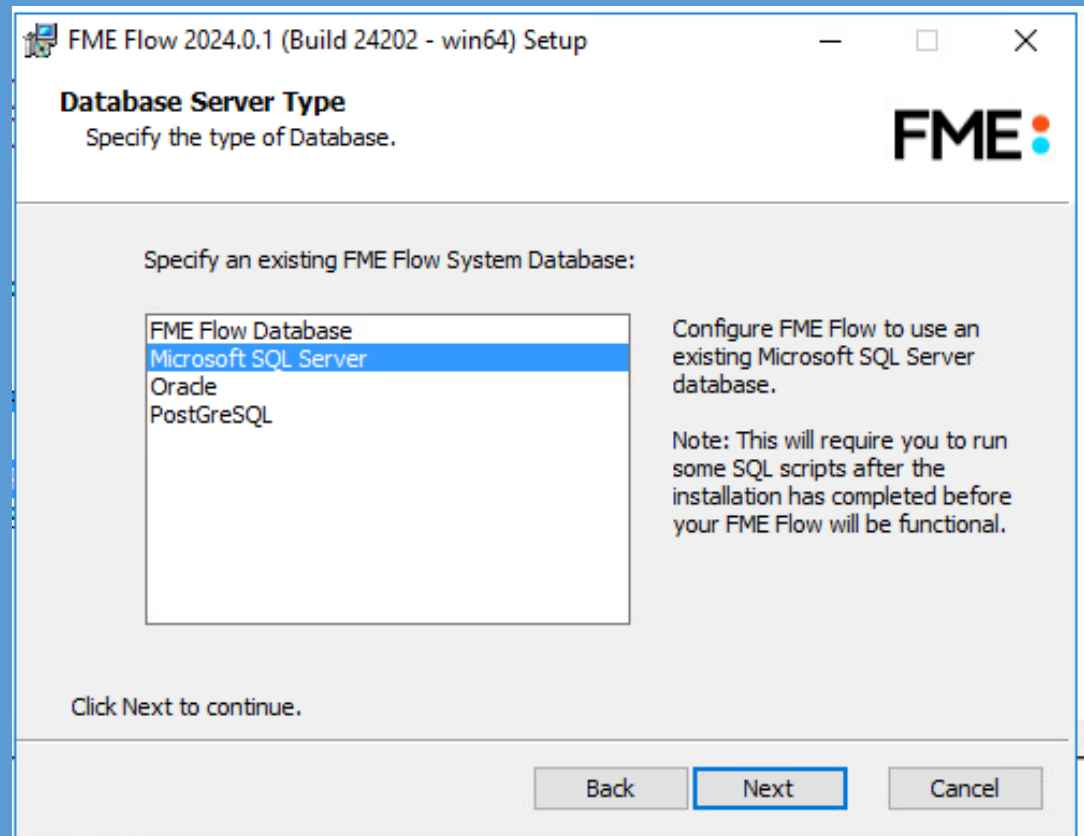
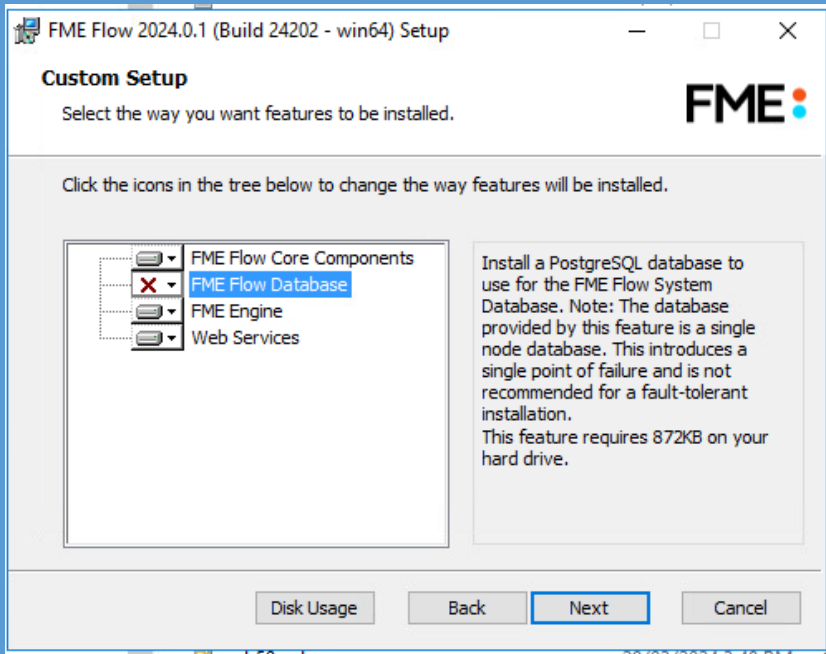
Host:

Port:

Use SQL Server instance name

FME Flow includes a default JDBC driver for PostgreSQL and Microsoft SQL Server. If your database requires a special version of the JDBC driver, you can specify it below.

Use Custom JDBC Driver



sql scripts
download
folder

FMEFlow > Server > database > sqlserver

Name	Date modified	Type
sqlserver_createDB.sql	8/05/2024 4:07 PM	Microsoft SQL Ser...
sqlserver_createUser.sql	8/05/2024 4:07 PM	Microsoft SQL Ser...
sqlserver_dropDB.sql	8/05/2024 4:07 PM	Microsoft SQL Ser...
sqlserver_dropUser.sql	8/05/2024 4:07 PM	Microsoft SQL Ser...



```
72
73 DB_TYPE=sqlserver
74 DB_DRIVER=com.microsoft.sqlserver.jdbc.SQLServerDriver
75 DB_JDBC_URL=jdbc:sqlserver://;port=1433;databaseName=fmeflow
76 DB_USERNAME=fmeadmin
77 DB_PASSWORD=fme_enc:XJ89wYdHYv1mP1PgiCqnog==
78 DB_CONNECT_EXPIRY=60
79 DB_SQLSTMTS_PATH=D:/Apps/FMEFlow/Server/database
80
```

```
DB_TYPE=sqlserver
DB_DRIVER=com.microsoft.sqlserver.jdbc.SQLServerDriver
DB_JDBC_URL=jdbc:sqlserver://;port=1433;databaseName=GisFmeDb2024_0
DB_USERNAME=fmeadmin
DB_PASSWORD=fme_enc:XJ89wYdHYv1mP1PgiCqnog==
DB_CONNECT_EXPIRY=60
DB_SQLSTMTS_PATH=D:/Apps/FMEFlow/Server/database
```



- GisDataHub131
- GisFmeDb2023_1
- GisFmeDb2024_0
 - Database Diagrams
 - Tables
 - System Tables
 - FileTables
 - External Tables
 - Graph Tables
 - Views
 - External Resources
 - Synonyms
 - Programmability
 - Service Broker
 - Storage
 - Security
 - Users
 - dbo
 - FMEAdmin
 - FmeServer
 - gisadmin
 - guest
 - INFORMATION_SCHEMA
 - mcc\srv-gisdbpoweruser
 - sys
 - Roles
 - Schemas
 - Asymmetric Keys
 - Certificates
 - Symmetric Keys
 - Always Encrypted Keys
 - Database Audit Specifications
 - Security Policies

Understanding AlwaysOn Availability Groups

Windows Server Failover Cluster

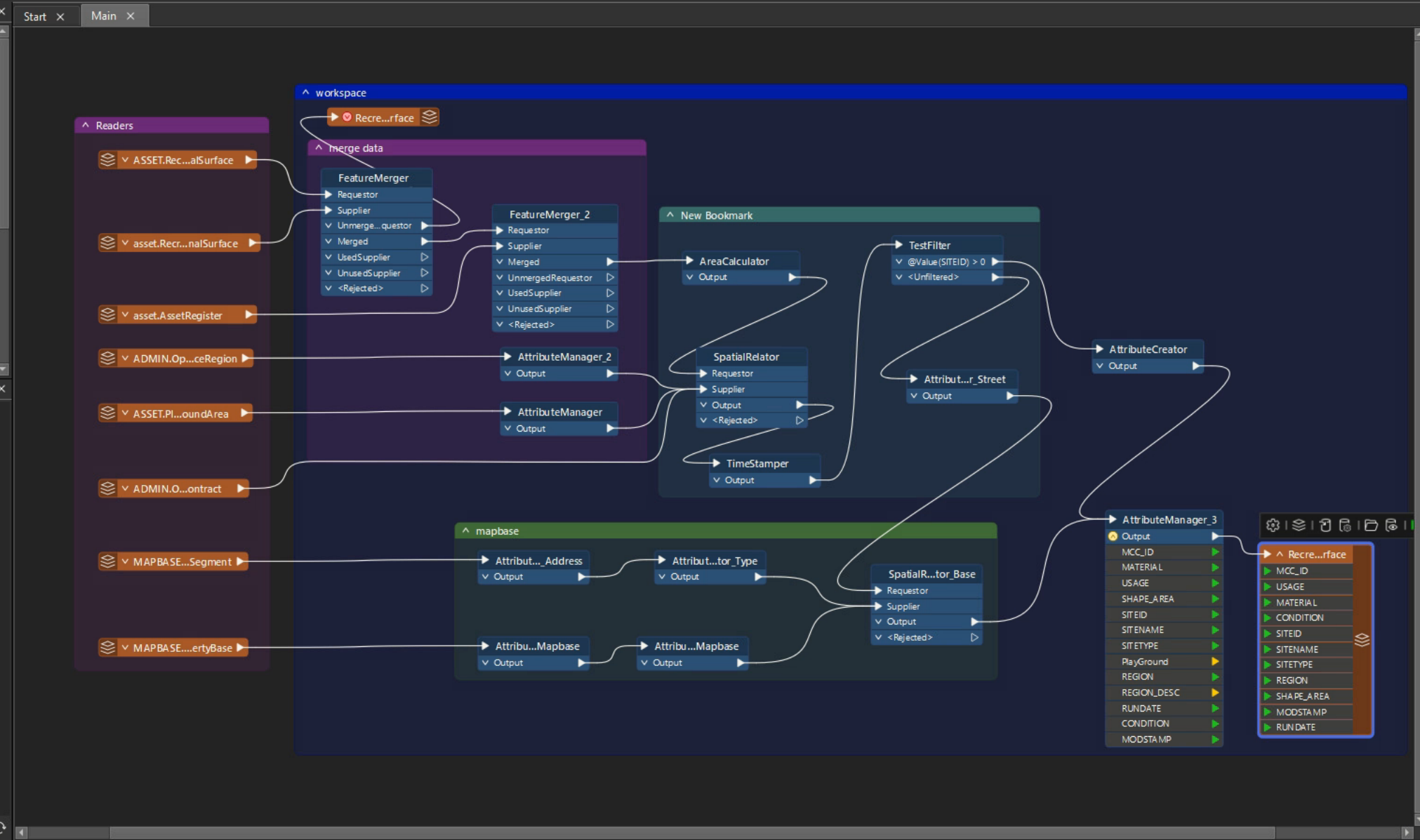


Navigator

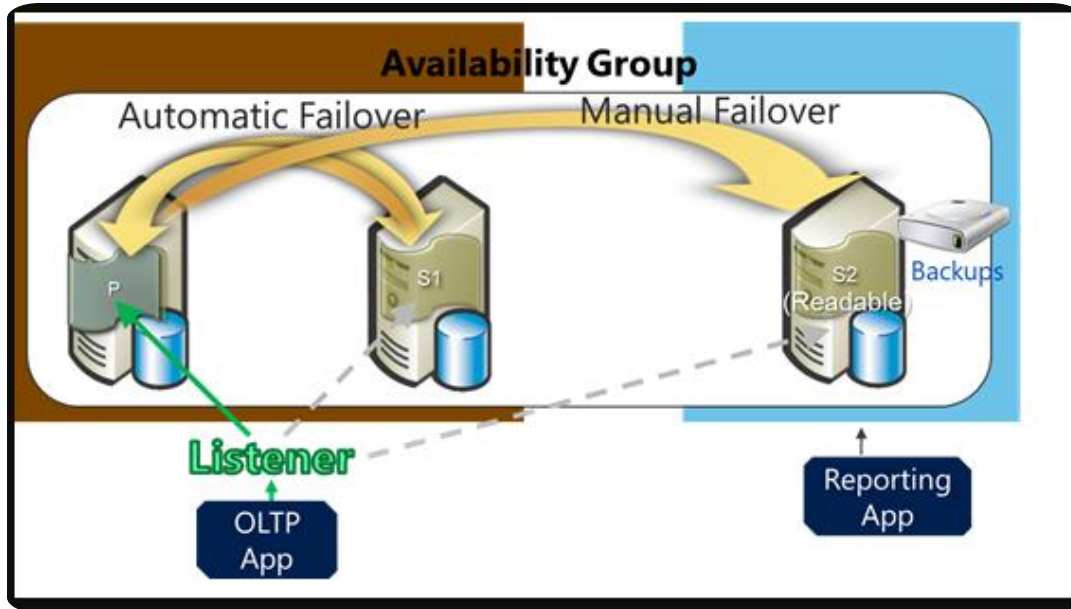
- Viewer [GEODATABASE_SDE]
- GisDataHub [MSSQL_ADO]
 - Connection: GisDataHub (Linked to 'CANDIDATE')
 - Coordinate System: <not set>
 - Parameters
 - Command
 - Command Timeout (Seconds): 30
 - WHERE Clause: <not set>
 - Advanced
 - Application Intent: ReadWrite
 - Number Of Records To Fetch At A Time: 10
 - SQL To Run Before Read: <not set>
 - SQL To Run After Read: <not set>
 - Features to Read
 - Feature Types (2)
- ShapeExport [SHAPEFILE]
- ShapeExport [CSV2]
- Transformers (16)
- Bookmarks (5)
- User Parameters (3)
- FME Flow Parameters
- Deployment Parameters

Transformer Gallery

- All (519)
- Categorized
- Embedded Transformers
- FME Hub
- Recent (10)
- Search Results



Benefits



Combined HA / DR

Zero Data Loss Protection

Failover of Multiple Databases

Automatic or Manual Failover

Local or Shared Storage

Active Use of Secondaries

Enhanced Performance

Restore 2023 to 2024

System Restore

Unable to import the migration package because it contains encrypted data that cannot be decrypted. Please apply the encryption key to FME Flow then try again.

FAILURE

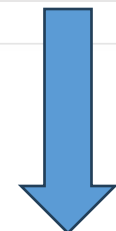
C > gis (\\mcc) (M:) > ApplicationSupportHA > FME > FMEFlow > 2023_1 > key

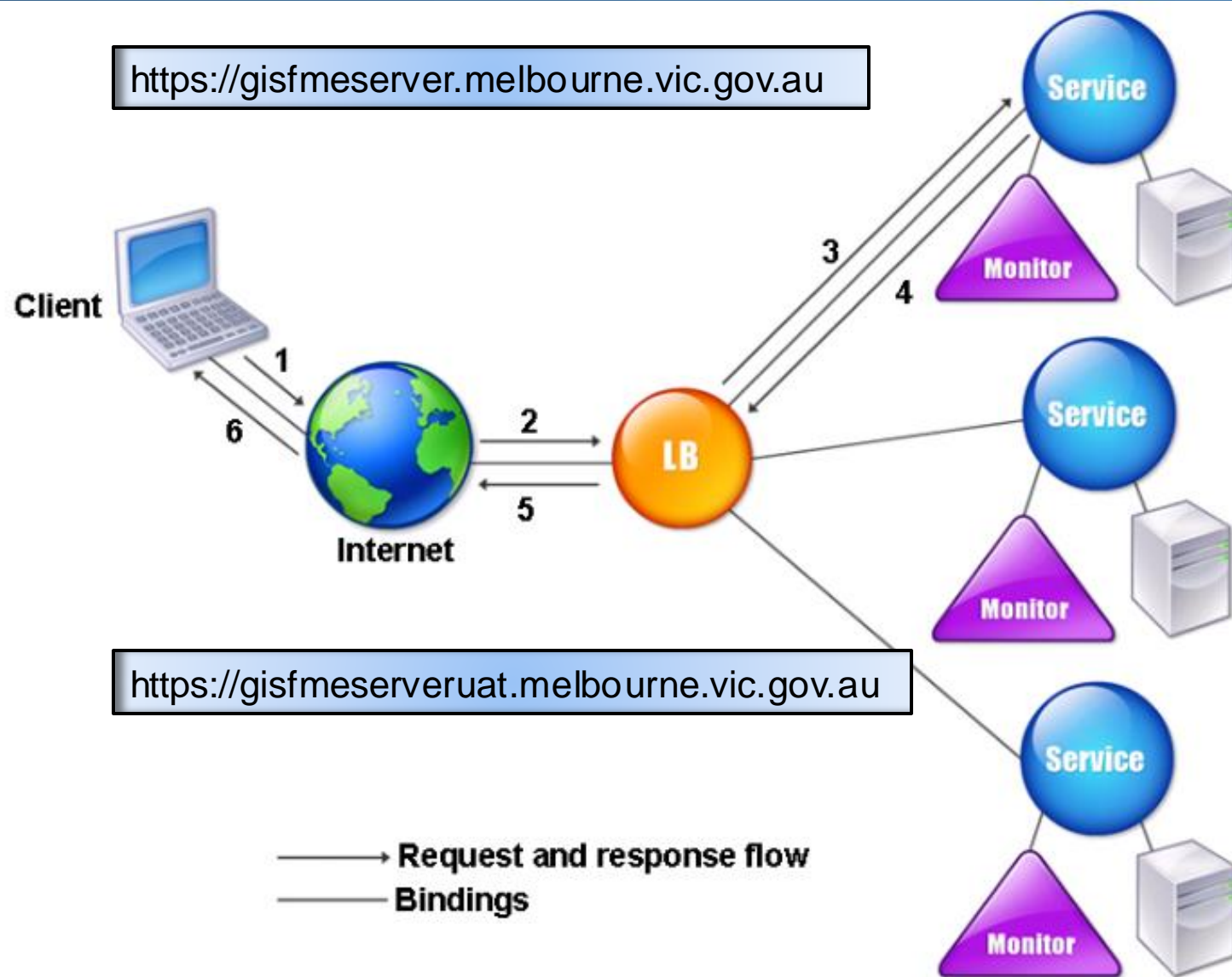
Name	Date modified	Type	Size
fme_server.jceks	13/09/2023 5:39 PM	JCEKS File	1 KB

PC > gis (\\mcc) (M:) > ApplicationSupportHA > FME > FMEFlow > 2024_0 > key

Name	Date modified	Type	Size
fme_server.jceks	31/05/2024 7:14 AM	JCEKS File	1 KB

Generate Key Upload Key Download Key





<https://gisfmeserver.melbourne.vic.gov.au>

<https://gisfmeserveruat.melbourne.vic.gov.au>

FME Flow 2024.0

[GISFME06.melbourne.vic.gov.au](https://gisfme06.melbourne.vic.gov.au)
Port 443, IP Address

[GISFME07.melbourne.vic.gov.au](https://gisfme07.melbourne.vic.gov.au)
Port 443, IP Address

FME Flow 2023.2

[GISFME04.melbourne.vic.gov.au](https://gisfme04.melbourne.vic.gov.au)
Port 443, IP Address

[GISFME05.melbourne.vic.gov.au](https://gisfme05.melbourne.vic.gov.au)
Port 443, IP Address

Outcome



Minimized System Downtime

Increased System Reliability

Enhanced Data Protection

Operating System Maintenance - Anytime

New Version – Quicker Turnaround Time

Graceful Degradation

What's on the menu



Deploy FME Flow – Docker / Kubernetes

Extensive use of Web Hooks

Push Integration - Sensors

Zero - ETL

Migrate to Windows Server 2022

IAAS - Infrastructure as a Service (Hybrid)

Remote Engines

FME Flow Use Cases



**EXTERNAL WEBSITE –
POWERED BY FME FLOW**

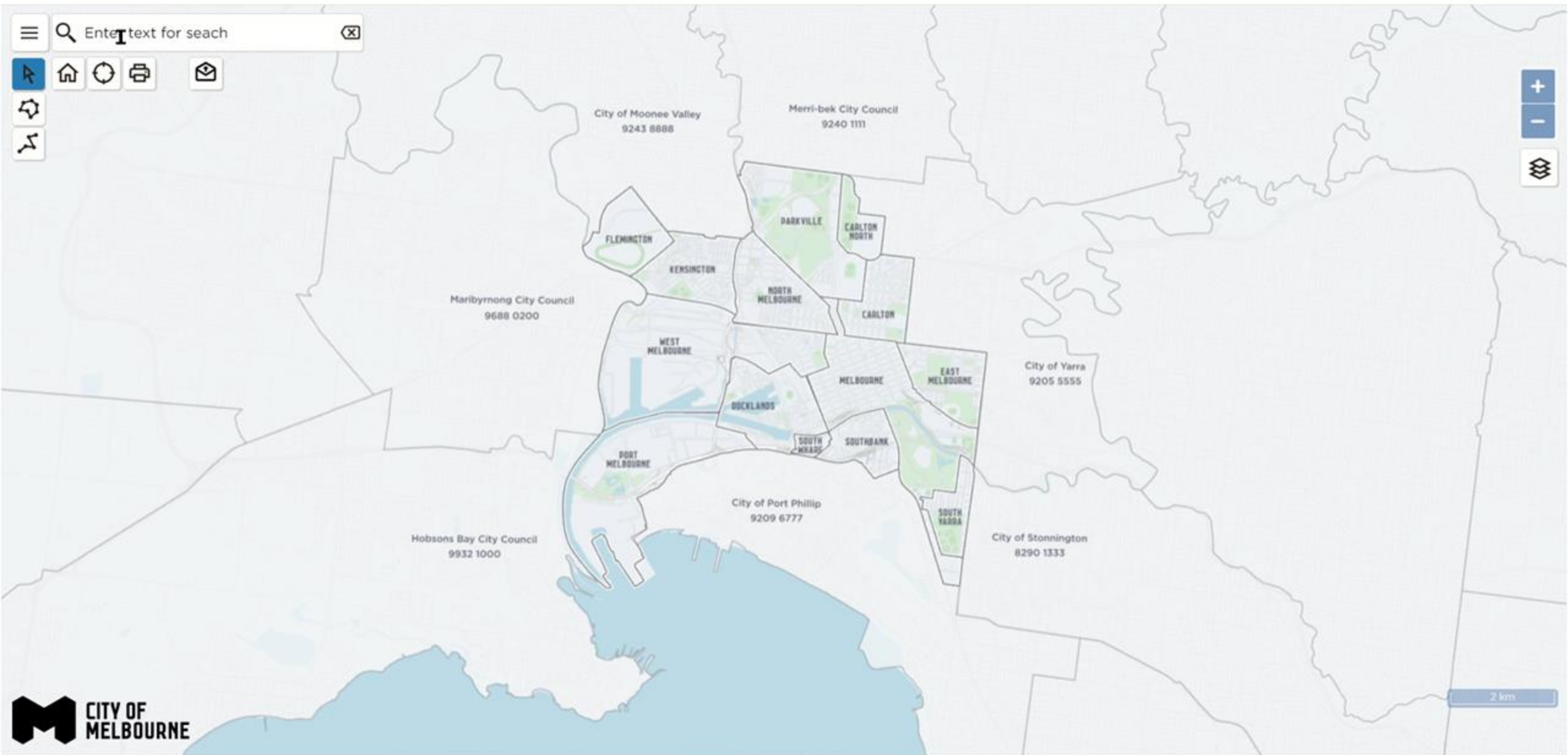


**SALES FORCE FME
ENDPOINTS**



**USER ZERO ETL
APPLICATION**

Enter text for search



2 km

- Streams >
- Flow Apps >
- Schedules >
- Jobs >
- Workspaces
- Projects >
- Connections & Parameters >
- Resources

- ADMIN
- Analytics
- User Management >
- System Configuration >
- Backup & Restore
- Engine Management >

Run Workspace ?

Share GisIntegration/GetContractAtLocation

Webhook URL

Webhook URL Preview:

<https://gisfmeserver.melbourne.vic.gov.au/fmedatastreaming/GisIntegration/GetContractAtLocation.fmw?X=144.9536041&Y=-37.7860808&AssetLayer=OpenSpace>

This webhook enables third-party software to programmatically run this workspace. Note that the API token associated with this webhook allows access to run any other workspaces in the same repository that are registered to the same service.

Token Name

Webhook - GetContractAtLocation from GisIntegration - 79f4848d-9718-3298-93a4-fe26bt

Description (optional)

Allow users to run GisIntegration/GetContractAtLocation without logging in

Expiration

2025-06-03 00:00



Will expire in a year.

Parameters >

Cancel

OK





Q & A

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