SMMePlus

System Infrastructure

V4.0

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Summary

The aim of this document is to describe the infrastructure of SMMePlus environments

References

List of the documents

[1] SMMePlus - Architecture → SMMePlus - Architecture v4.0.pdf

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1. Introduction

1.1. Purpose

The aim of this document is to describe the infrastructure of SMMePlus system.

2. Infrastructure

2.1. Service Fabric

SMMePlus system is a Service Fabric Application backed by several virtual servers that form a Service Fabric Cluster. This set of virtual machines hosts microservices and Service Fabric Runtime.

Availability and efficiency are granted by replication of service's state and distribution of replicas among different machines.

More information about Service Fabric are available at https://docs.microsoft.com/en-us/azure/service-fabric/.

2.1.1. Operator System

The operator system of the servers of the cluster is Windows Server 2016 Datacenter

2.2. Database

2.2.1. Type

The database of SMMePlus are SQL Azure (DB as a Service)
https://docs.microsoft.com/en-us/azure/sql-database/sql-database-technical-overview

The database doesn't store all the commercial information.
Only few commercial information (last reading and last credit for each meter) are kept in database for being shown in report.

2.2.2. Azure SQL Autiding

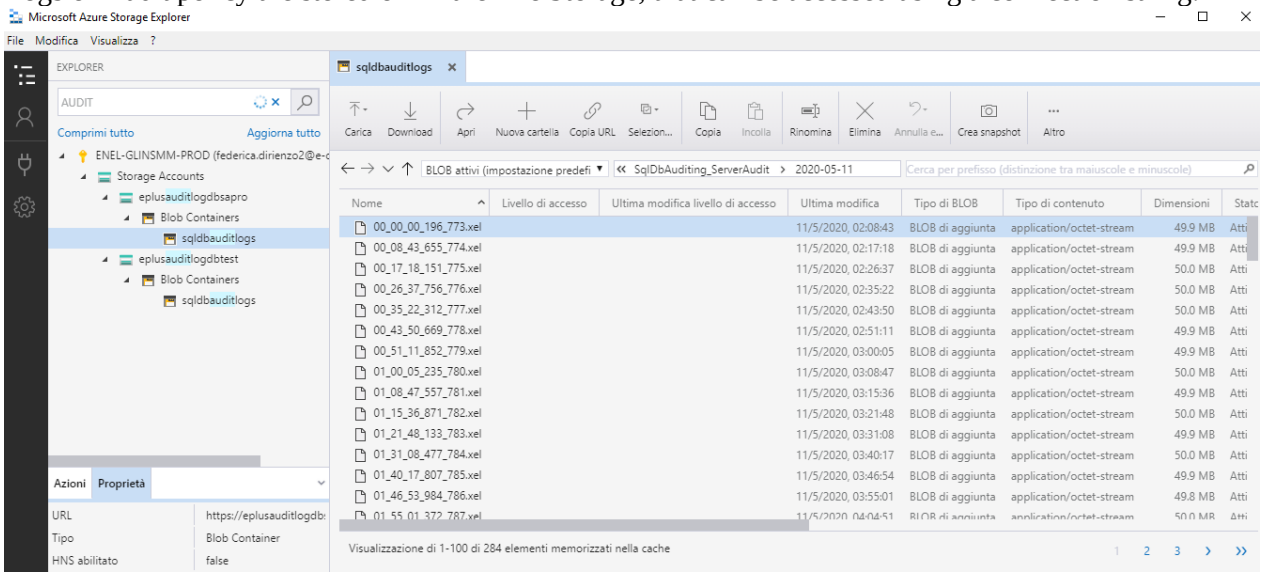
On production server (smmeplus-db-sa-server.database.windows.net) the Auditing feature is enabled with default policy.

The default auditing policy includes all actions and the following set of action groups, which will audit all the queries and stored procedures executed against the database, as well as successful and failed logins:

- BATCH_COMPLETED_GROUP
- SUCCESSFUL_DATABASE_AUTHENTICATION_GROUP
- FAILED_DATABASE_AUTHENTICATION_GROUP

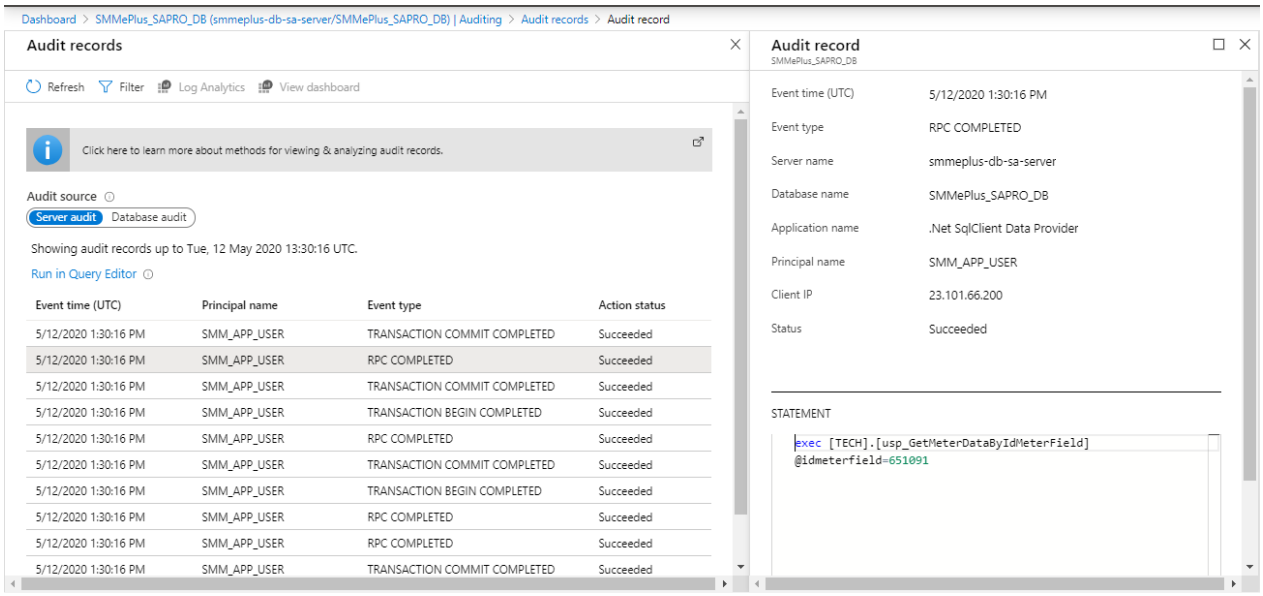
https://docs.microsoft.com/en-us/azure/sql-database/sql-database-auditing

Logs of Audit policy are stored on Azure File Storage, that can be accessed using a connection string.

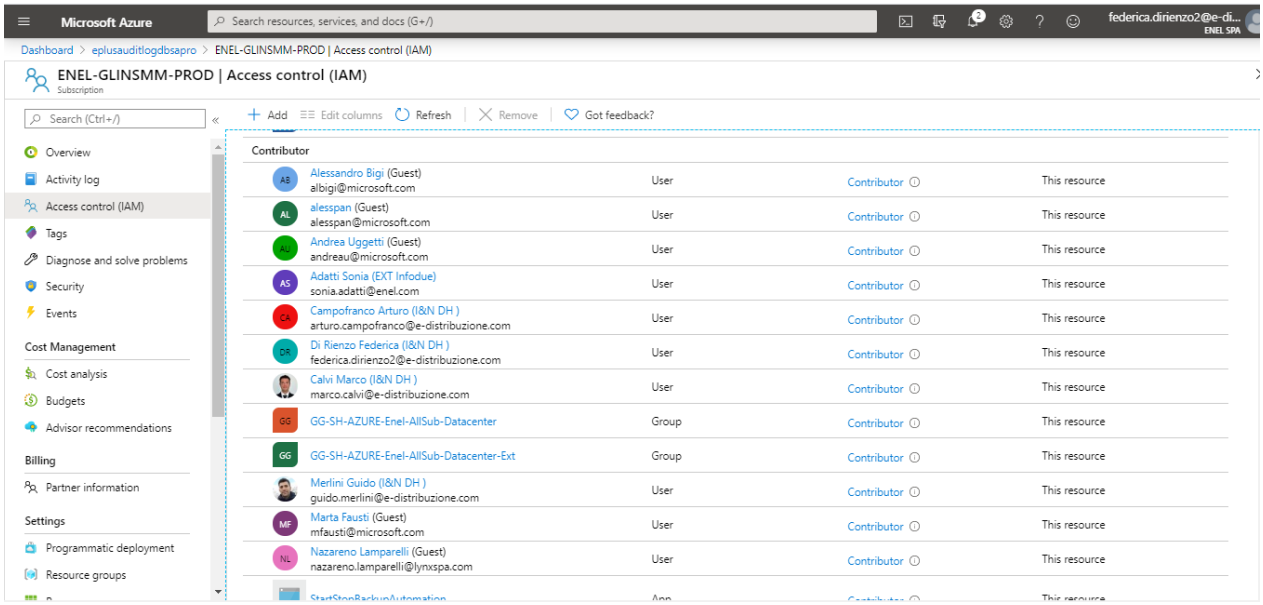


The files can be downloaded and opened with SQL Server Management Studio.

It’s possible to explore the Audit policy logs also in Azure portal.



Only users configured for accessing the Azure Portal and enabled on subscription



2.2.3. Backup and restore

SQL Database uses SQL Server technology to create full backups every week, differential backups every 12 hours, and transaction log backups every 5-10 minutes. The backups are stored in RA-GRS storage blobs that are replicated to a paired data center for protection against a data center outage. When you restore a database, the service figures out which full, differential, and transaction log backups need to be restored.

The Point in Time recovery is available for 35 days.
The Long Time recovery is configured as following:

- Weekly backup available for 6 months
- Monthly backup available for 1 year

2.2.4. Data Encription

Transparent data encryption is enabled.
This feature encrypts databases, backups, and logs.
Here are more details:
https://docs.microsoft.com/it-it/azure/sql-database/transparent-data-encryption-azure-sql?view=sql-server-ver15&tabs=azure-portal

2.3. Website

In UAT and Production environment, the websites are hosted in Azure Application Service Environment. The Environment is mapped in Enel domain **enelint.global** and website can be reached only from Enel nework.

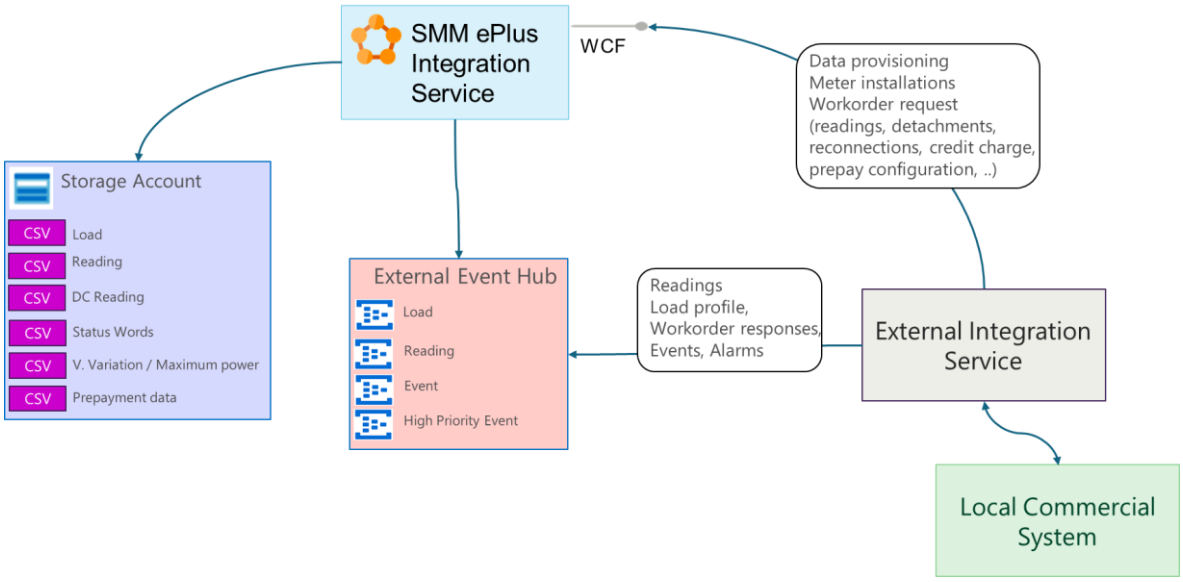
https://docs.microsoft.com/it-it/azure/app-service/environment/intro#overview

2.4. Collected information

As described in SMMePlus – Architecture (Reference [1]), the information collected by SMMePlus are available for local business in two ways:

- csv files for each day for readings, daily closures, load profiles, prepayment information, maximum powers

- pushes data on external Event Hubs so that external services can download them asynchronously



CSV are available on Storage Account. Each storage account contains information of a single company and can be accessed with a connection string.

The Event Hub is a cloud stream on which is it possible to subscribe using a specific consumer identification and key.

3. Log

3.1. Website

Each website logs activities in a text file per each day.
This is an example of log file. It refers to 7th of May in UAT environment.

SMMePlus.WP-2020
0507.log

This is an example of log file. It refers to 8th of May in PRO2 environment.

SMMePlus.WP-2020
0508.log

This is an example of log file. It refers to 5th of May in PRO environment.

SMMePlus.WP-2020
0505.log

These files are saved in the same FTP folder of the web site and are never deleted.
To access the FTP it's required the username and the password.

3.2. Backend

The services in backend logs in text files in the file system of the servers.
These logs are used in case of specific analysis, usually if an activity has some problems in execution.

To access these logs it's necessary to have local access to servers of the cluster.

3.3. Database

As described in section 2.2.2 SQL Auditing, the SQL Auditing feature is enabled and writes on Azure Storage Explorer the logs of queries and stored procedure, success and failed log in.

3.4. Report

In SMMePlus website, reports are used to check results of activities in the system.

Here are some information extracted from database.

In following files, it's possible to see activities executed on 29th of April.
extraction_workordercompleted_2020-04-29.csv
extraction_workcompleted_2020-04-29.csv


extraction_workco
mpleted_2020-04-29


extraction_workord
ercompleted_2020-0


extraction_profileus
er.csv

Workorders are remote activities on meters.
Works are remote activities on concentrators. A work can have several workorders associated, in case the concentrator has to forward to meters the activityes.

In extraction_provisioningfile_2020-04-21.csv it's possibile to see an example of csv file uploaded by the user in the system.


extraction_provisio
ningfile_2020-04-21.

This information are stored in database.
For accessing database it's necessary to:

- Have the username and password
- Have the source ip address enabled in firewall

4. Configuration

4.1. PRO 1 Configuration

4.1.1. Service Fabric Cluster

Cluster name: smmeplus-sfclu-sa-pro

Node 0	10.132.20.196	23.101.66.200:3389
Node 1	10.132.20.197	23.101.66.200:3390
Node 2	10.132.20.198	23.101.66.200:3391
Node 3	10.132.20.199	23.101.66.200:3392
Node 4	10.132.20.200	23.101.66.200:3393

4.1.2. External Load Balancer

23.101.66.200 (LBIP-smmeplus-sfclu-sa-pro-0)

4.1.3. Internal Load Balancer

10.132.20.228

4.1.4. Website

4.1.4.1. URL

https://smmeplus-web-sapro.enelint.global/

4.1.4.2. Application service environment

Domain enelint.global (10.132.20.75)

4.1.5. Wake up listener

4.1.5.1. Chile

10.132.20.228
Port: 58692

4.1.6. Database

Server: smmeplus-db-sa-server.database.windows.net
Read-only server: smmeplus-db-sa-ro-server.database.windows.net