



Data Management Component for Virtual Factories Systems

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Data Management Component Objectives

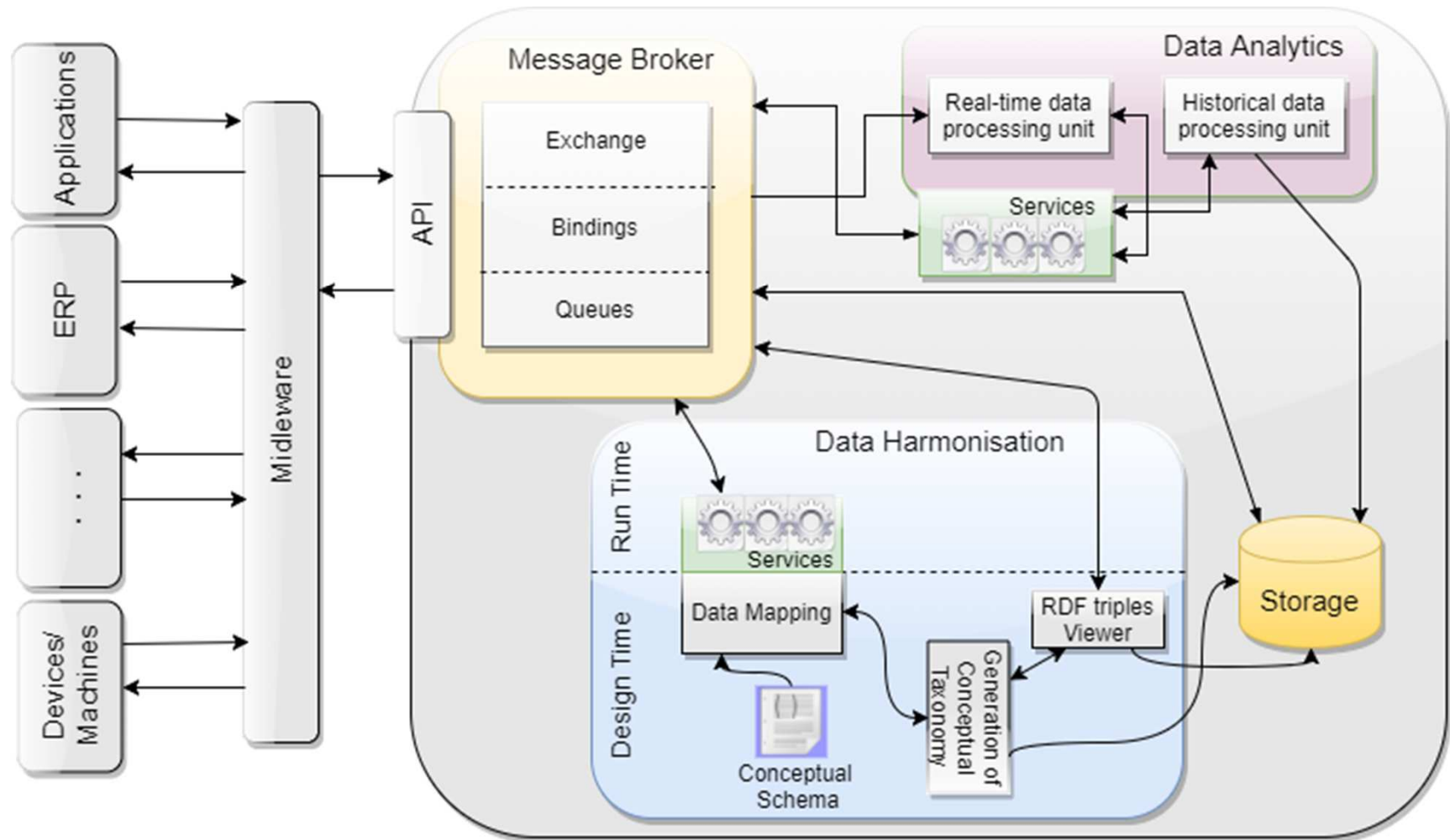
The *vf-OS* applications will consume and produce tremendous amounts of data

Objectives:

- Handle all vf-OS communication;
- Data storage capable of storing all vf-OS data;
- Harmonise vf-OS data;
- Analytic methods for enrichment, analysis and data interpretation.

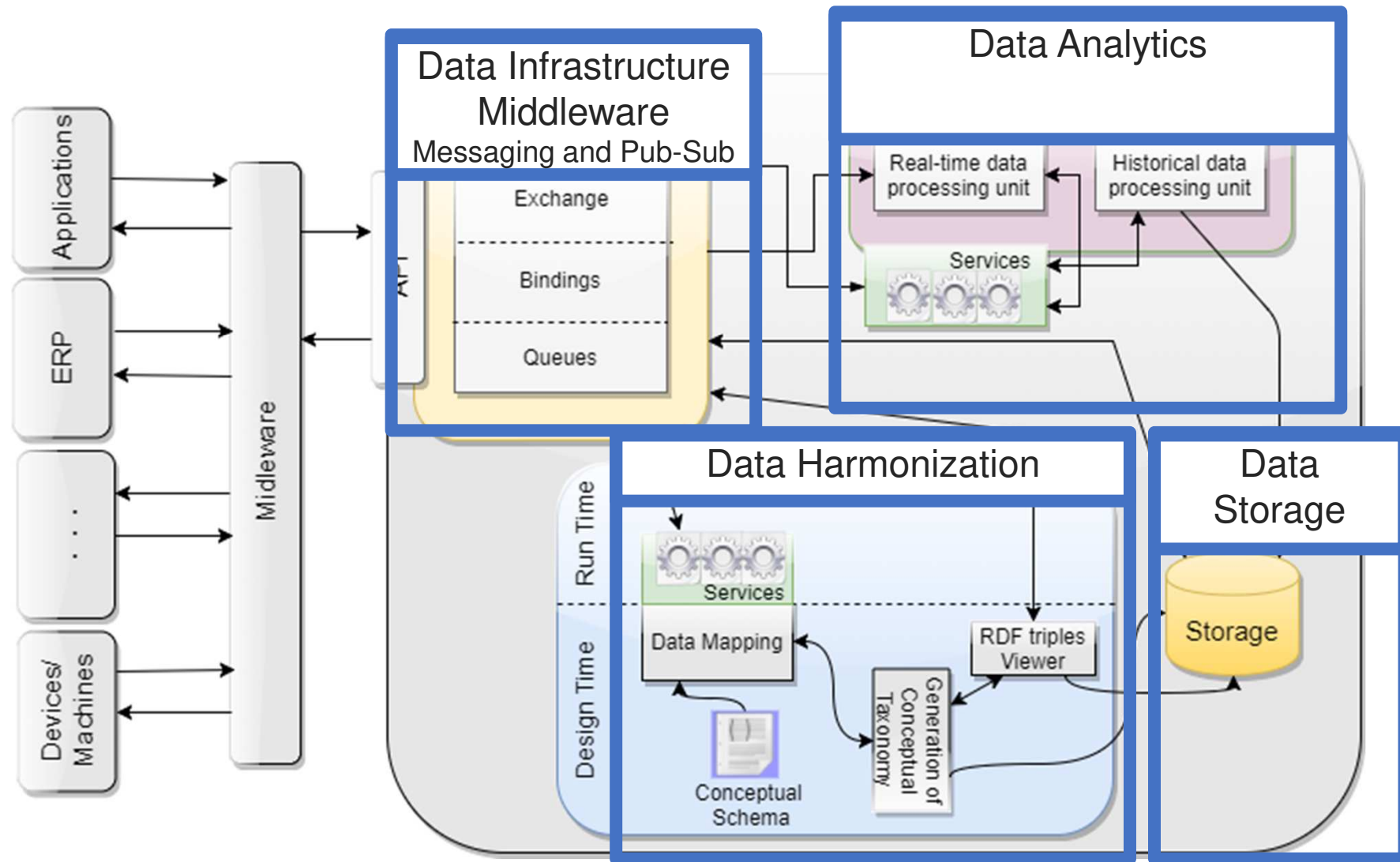


Virtual Factory Data and Connect- Data Management Component (DMC)

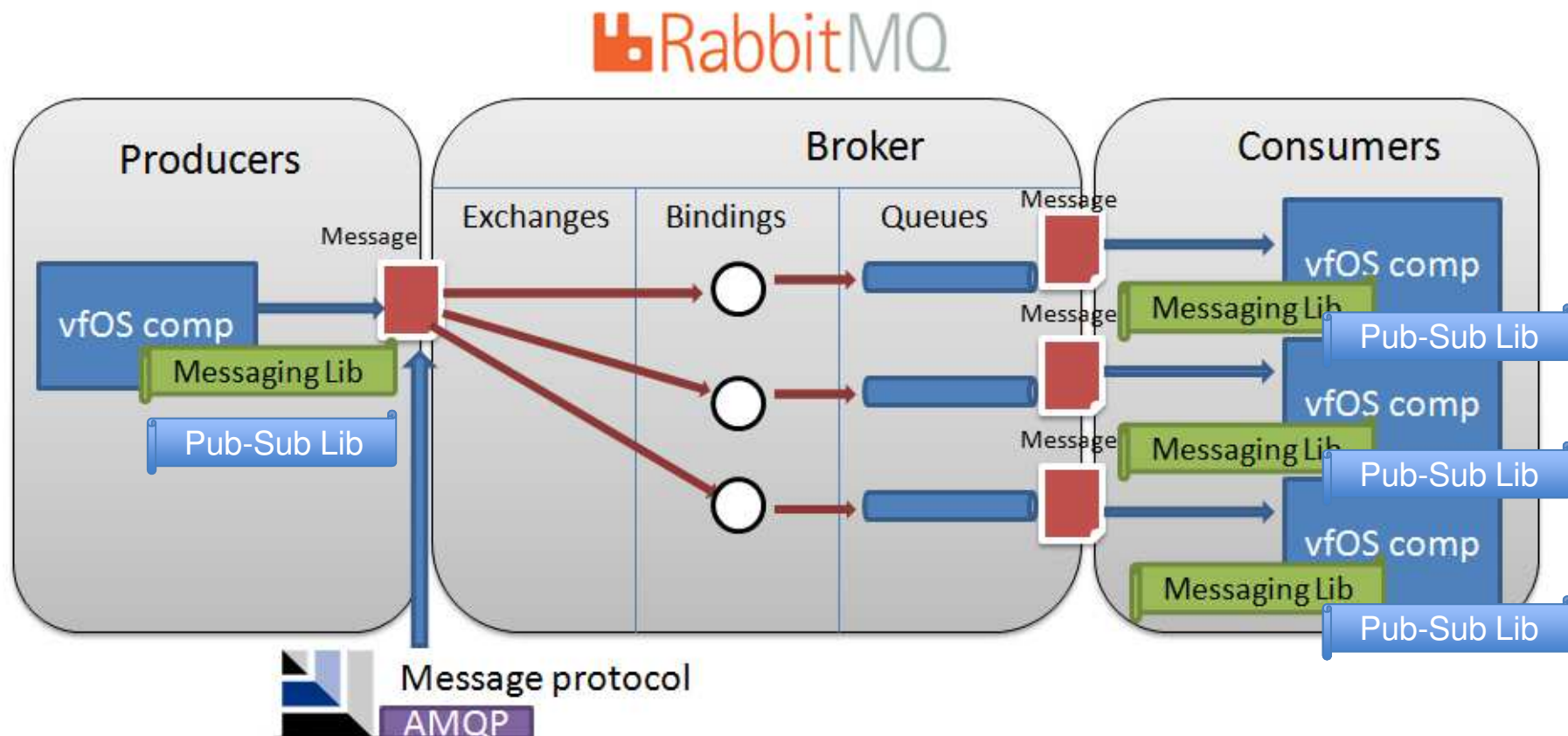




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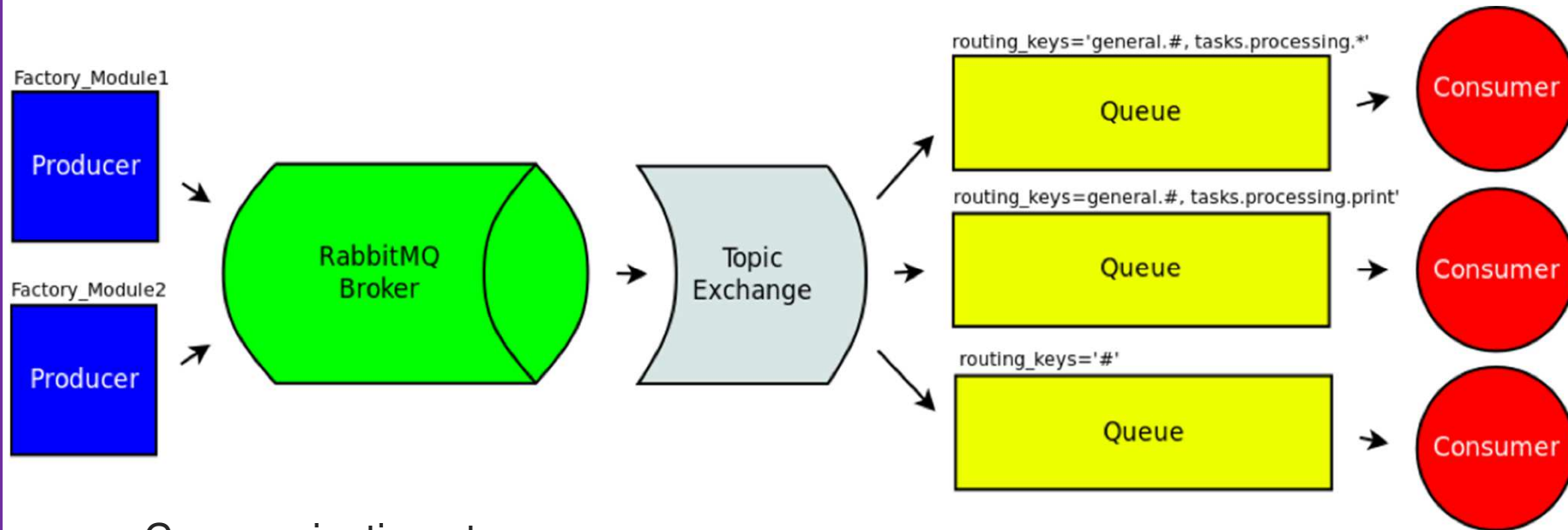


Data Infrastructure Middleware relies on Message Oriented approach based on RabbitMQ using the AMQP protocol.
Develop the message and publish/subscribe components



General representation of Data Infrastructure Middleware

Producer-Consumer Model for vf-OS



Communication steps:

- 1) Producer sends one message to one exchange and to one or more queues (with routingKeys);
- 2) Broker redirects the message to designed exchange;
- 3) The queues that are linked to the routingKeys will receive the message;
- 4) Consumers that are listening to specific queue get the message.

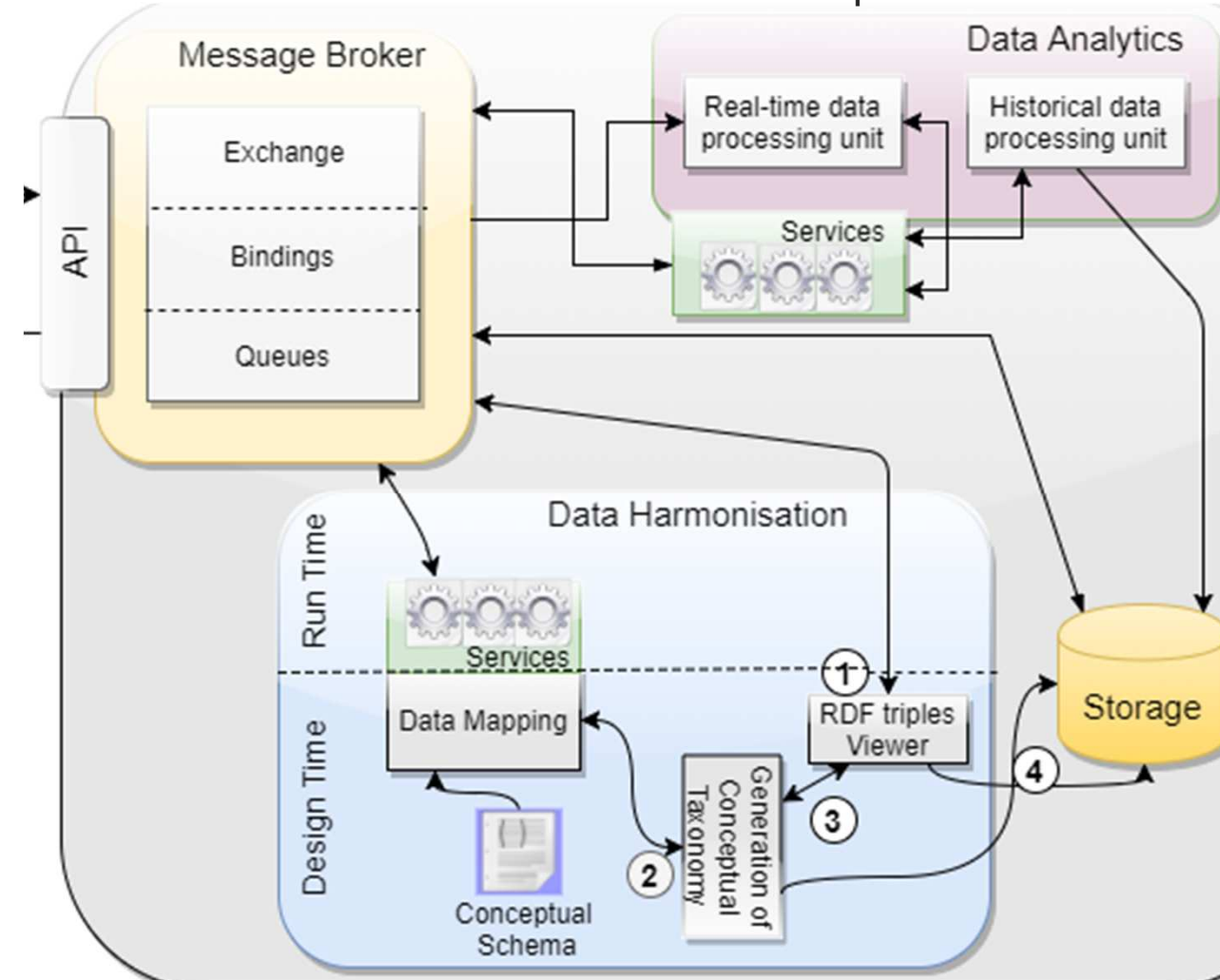
Data Storage has to provide storing services for heterogeneous data from heterogeneous sources



vf-OS usage:

- Relational data - relational data from vApps as well as other relational information of the vf-OS Platform itself;
- Time Series data - to allow storage and querying time series data. E.g: Sensor data
- Document-Oriented data - to store, retrieve and manage document-oriented information, also known as semi-structured data;
- RDF data - to store and query subject-predicate-object triples to be used in the conceptualization taxonomy (Data Harmonization module).

Data Harmonisation has to provide taxonomy connections for vf-OS data, through the detection of non-linear and non-trivial patterns within the data



Design time:

1. Receive vf-OS data
2. Data arrangement
3. Link the data concepts
4. Store data concept connection for future use

Run:

1. Use pre-stored data relations to link vApps' data

Data Analytics has to provide analytical processing for sensor data.

Types of Data to be considered:

- Real-time data (alarms, critical actions);
- Historical Data (stored data for a certain period).

Types of algorithms to be used:

- Machine learning algorithms;
- Traditional data-mining algorithms (e.g. decision trees and rules, k-means, association rules).

In development

- The Data Management Component, to be developed during the vf-OS' WP5, intends to manage data flows for vf-OS platforms.

Message Oriented Middleware

Data
communication
management

Data Harmonisation and Data Analytics

Transforming and
representing data

Data Storage

Store vf-OS data

Main Goals

Scalability

Adaptability

Questions?

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