

Revising the LSA (Layered Scalable Architecture)



Applies to

SAP BW 3.5, BI 7.0, EDW. For more information, visit the [EDW homepage](#).

Summary

This document is about introducing new layer called Data Distribution Layer (DDL) in SAP's Layered Scalable Architecture (LSA).

Author: Nilesh Ramesh Ahir

Company: IBM India

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Author Bio



Nilesh Ahir has completed his masters in Software System from BITS Pilani. He has total 5+ years of SAP experience. He has been working as SAP NW BI Package Solution Consultant for IBM India for last couple of years. Prior to this he was working with Intel India. He has experience in ABAP, BW3.5 / BI7.0 and Data mining. He has worked on other non-SAP technologies like NLS, TIBCO and Web Services.

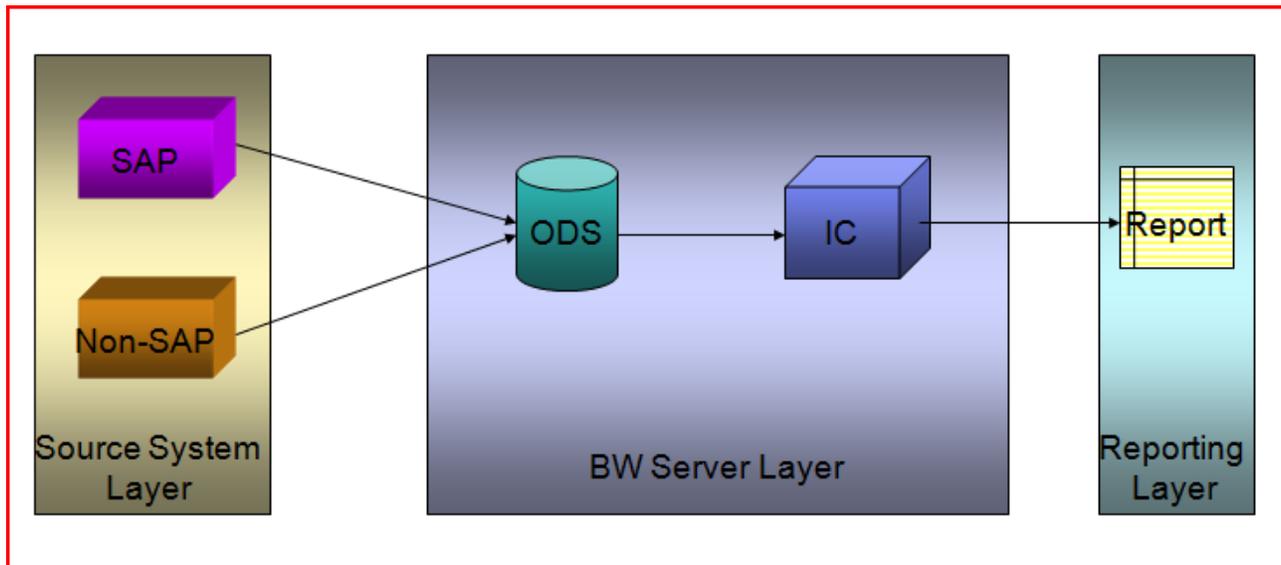
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Introduction

We are using the non-layered approach for BW/BI implementation. Currently approximately 90 –95% implementations are done using non-layered approach.

We are fetching data from SAP and Non-SAP source system. We are doing data cleaning and transformation by applying the business logic in Transfer rules. Finally data at detailed level or line item level will be loaded to ODS. Data at slightly summarized or highly summarized level will be stored in Info cube. Reporting is done from this Info cube. Detailed reporting is done from ODS.



This approach will hold good for the small implementations. But has following drawbacks if we use same approach for the large implementation especially in case where we are having single BW/BI Instance (Single BI Server worldwide)

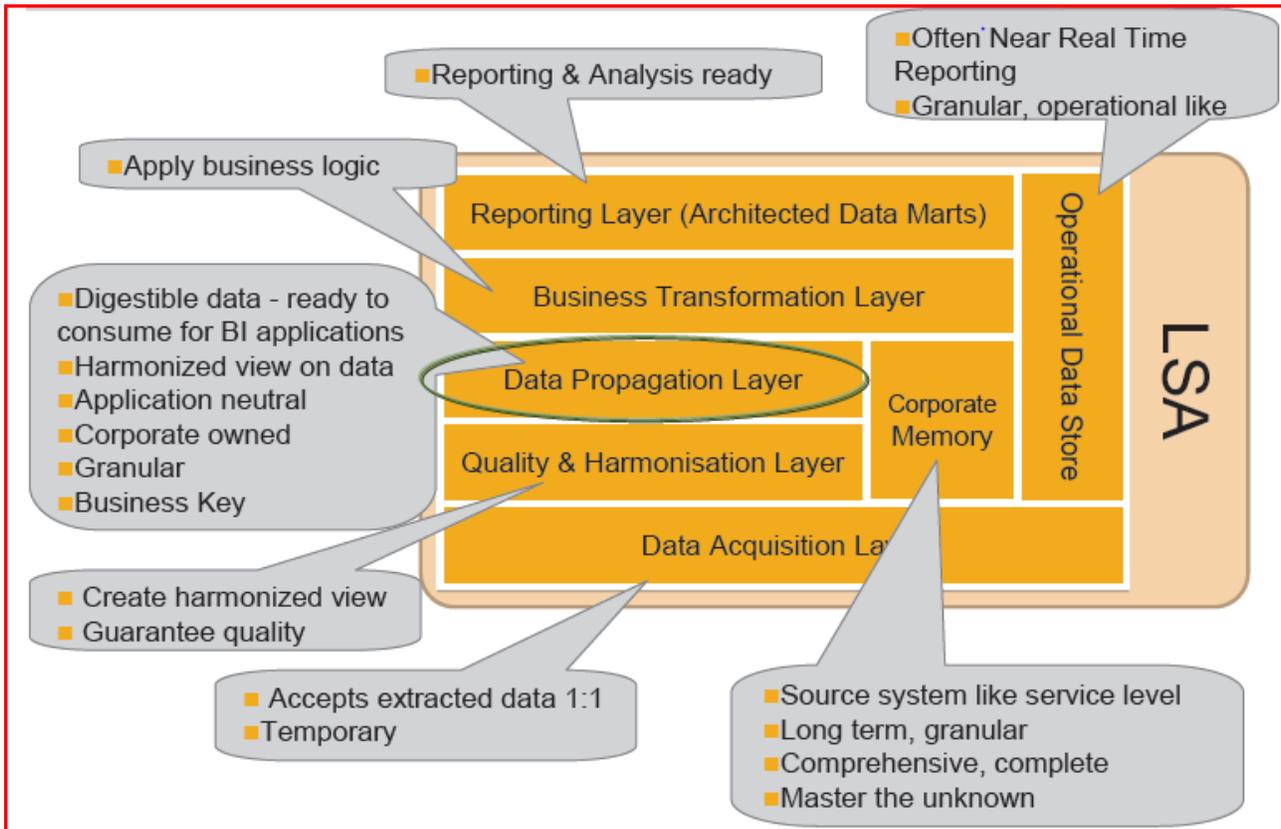
Performance both ETL and data retrieval will go down as data volume increases

Difficult to manage

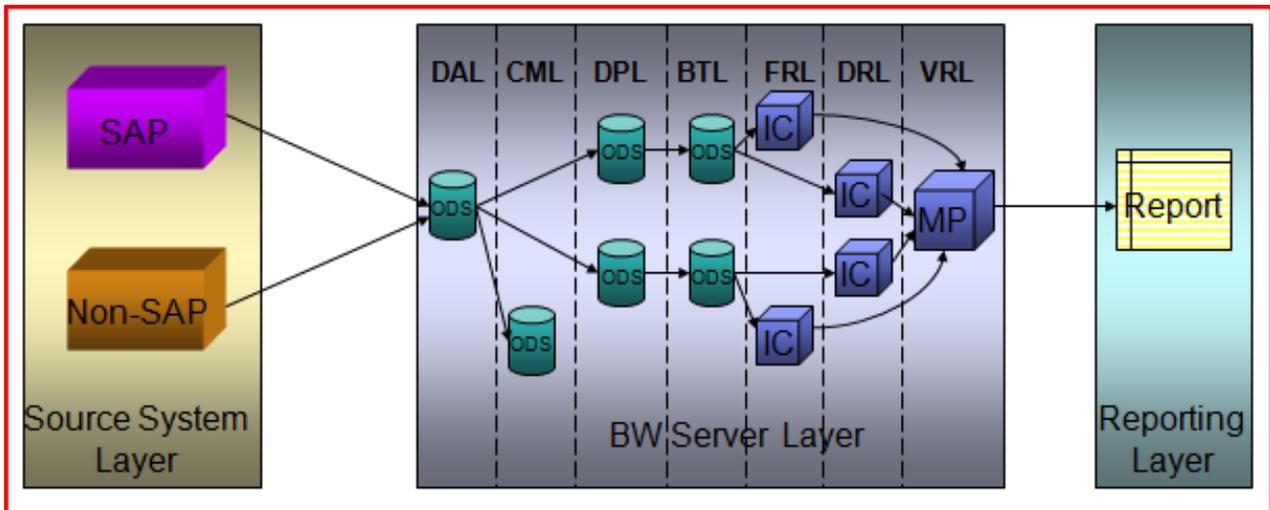
Overall complexity will be very high

Data recovery is difficult

Therefore SAP introduces a new architecture called LSA – Layered, Scalable Architecture in order to describe the design of service-level oriented, scalable, best practice BW architectures founded on accepted EDW principles as introduced in Bill Inmon’s Corporate Information Factory (CIF). This is an Architecture used for Large BW implementation at enterprise level. This is an SEVEN layered architecture Every layer of this pattern has been designed to serve the particular purpose. This Architecture will help you in boosting the overall performance of the system and making your implementation flexible enough to adapt future enhancements.



The LSA serves as a reference architecture to design transparent, complete, comprehensive customer DWH architectures (Customer LSA). The Customer LSA describes corporate standards to build BI applications in a performant, maintainable, flexible manner.



Advantages

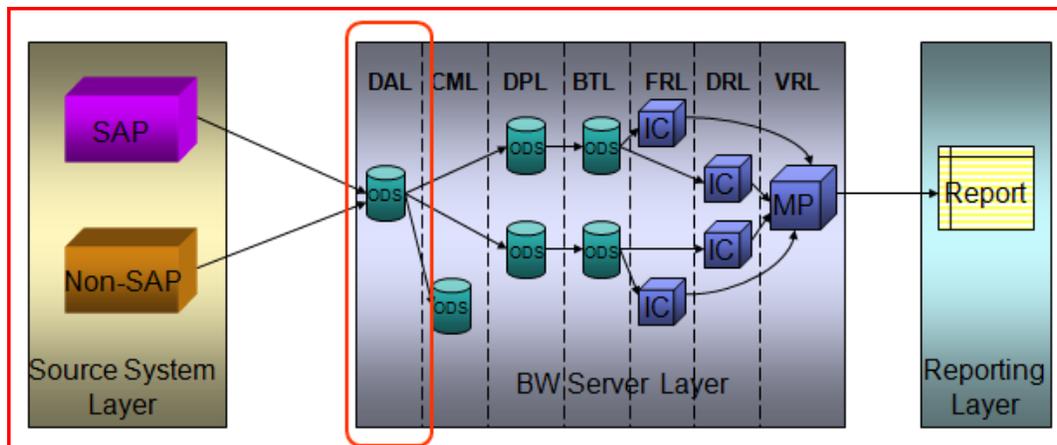
1. Existence of EDW layer allows data marts (DM) to be decoupled from sources.
2. Reduces the need for interdependencies between data marts
3. Reduced long term TCO and time to market of new data mart developments.
4. Improved Scalability
5. Use of EDW layer is aligned with the ownership of data
6. EDW provides the framework that allows the construction of regional/ time zone or country data marts
7. Offers organizational and cost benefits because decentralized approach to data mart construction would be feasible

Layers of LSA

Architecture uses 7 layers namely,

- + Data Acquisition Layer
- + Quality and Harmonization Layer
- + Corporate Memory Layer
- + Data Propagation Layer
- + Business Transformation Layer
- + Reporting Layer (Flexible Reporting Layer + Dimensional reporting Layer + Virtual reporting Layer)
- + Operational Data Store Layer

Data Acquisition Layer (DAL)

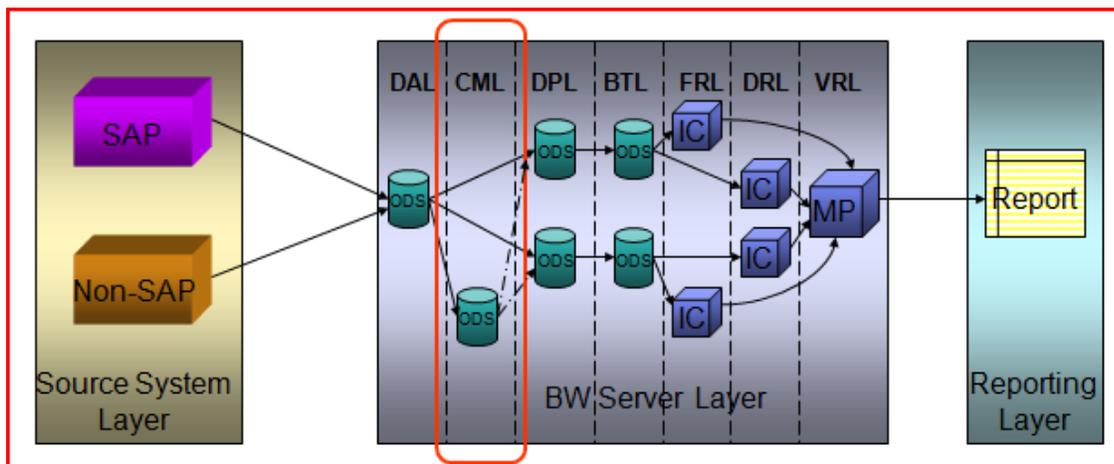


- This layer is mandatory and is used to pass the information from the source into the data warehouse.
- Data life is 1 day
- Logical Partitioning characteristic value is determined in Transfer rule while loading data to DAL ODS

Quality transformation layer (QTL)

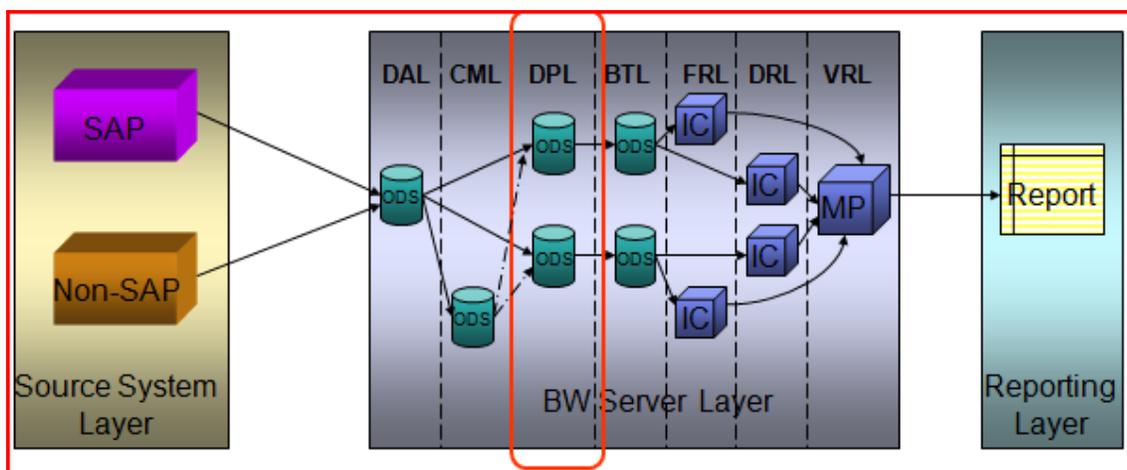
- Is optional: it is used only if the quality of the data extracted doesn't correspond to the general accepted level
- Ensures the quality of the data loaded in the warehouse from a non- SAP source
- Receives data from the data acquisition layer
- Feeds data into the corporate memory
- Transforms master data from several source systems to gain an integrated view of the master data
- Ensures transaction and master data consistency

Corporate Memory Layer (CML)



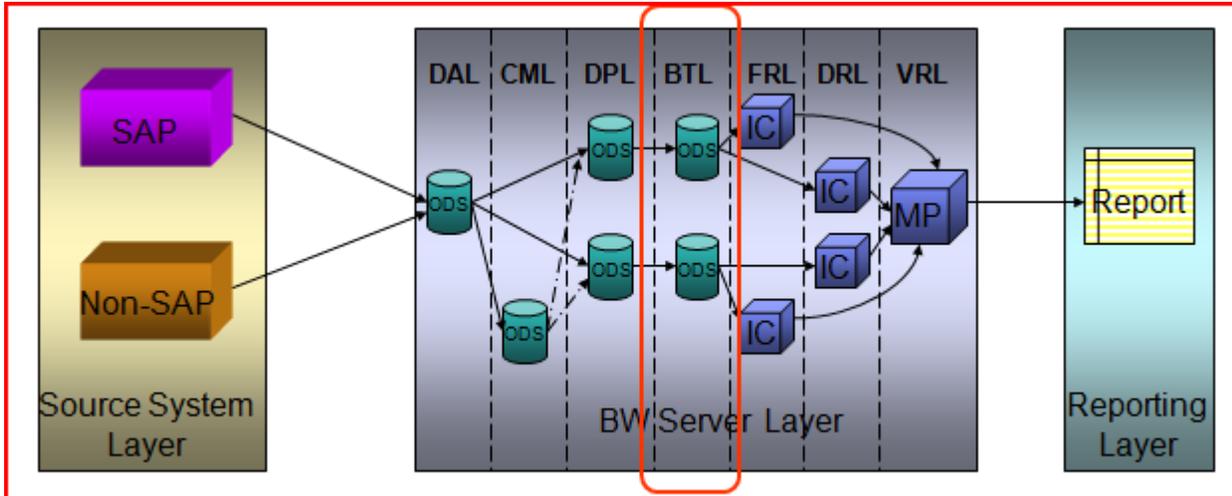
- This layer is mandatory and acts as data backup and recovery solution within BW/BI
- Data life is 2 years
- Will get data from DAL as Full load
- Will have connection with DPL for data recovery purpose

Data Propagation Layer (DPL)



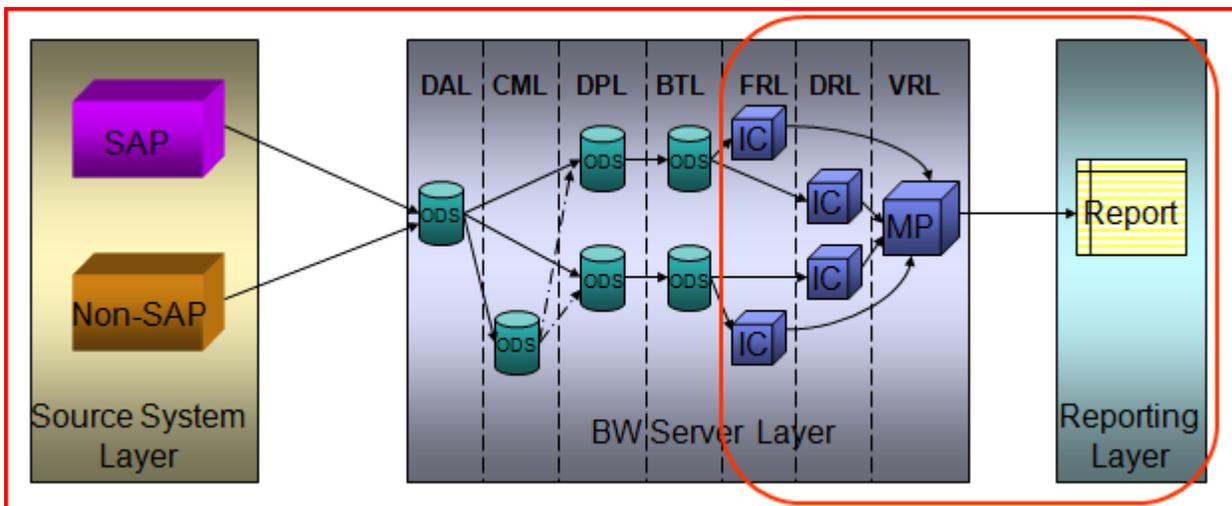
- The data propagation layer is mandatory and is used to contain the logically partitioned data
- Data life is 2 years
- Will get data from DAL as Full load
- Will have connection with CML for data recovery purpose

Business Transformation Layer (BTL)

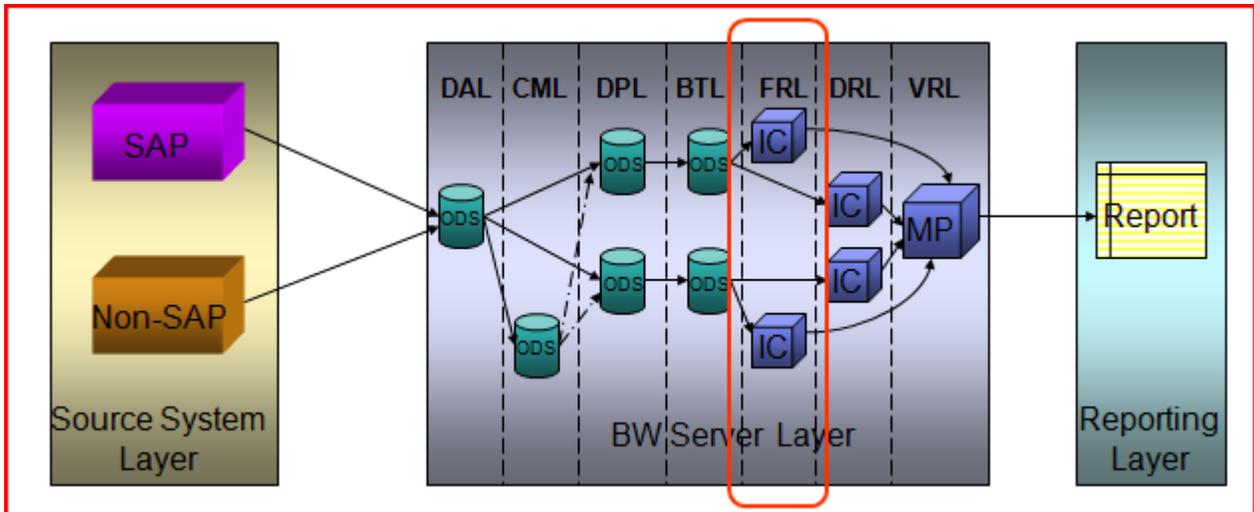


- This layer is optional and contains ODSes with logic data split
- Business transformation logic is implemented in update rule between DPL and BTL
- Data life is 2 years
- Will get data from DPL as Delta load

Reporting Layer

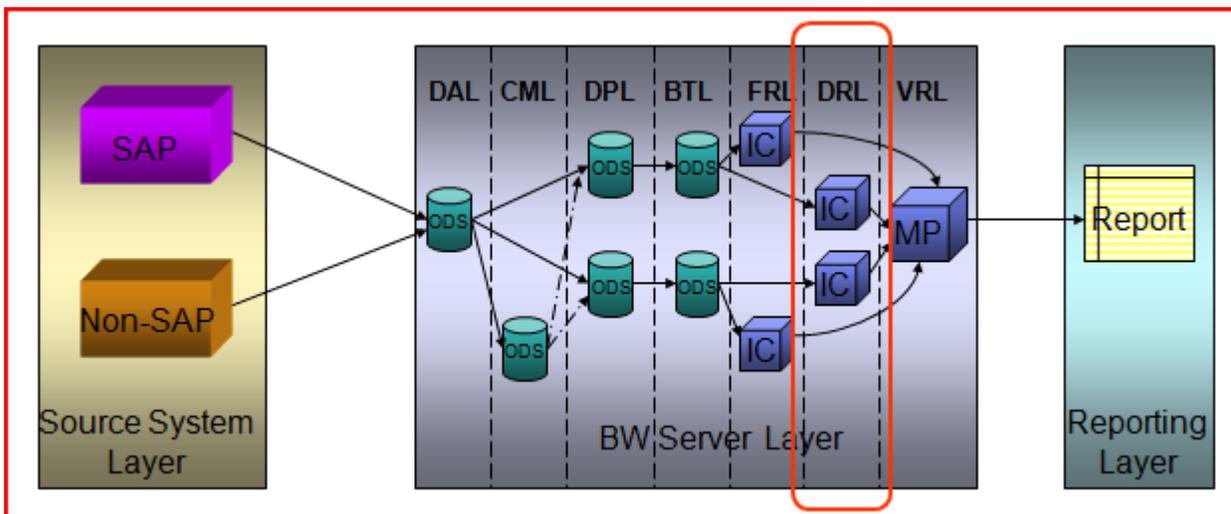


Flexible Reporting Layer (FRL)



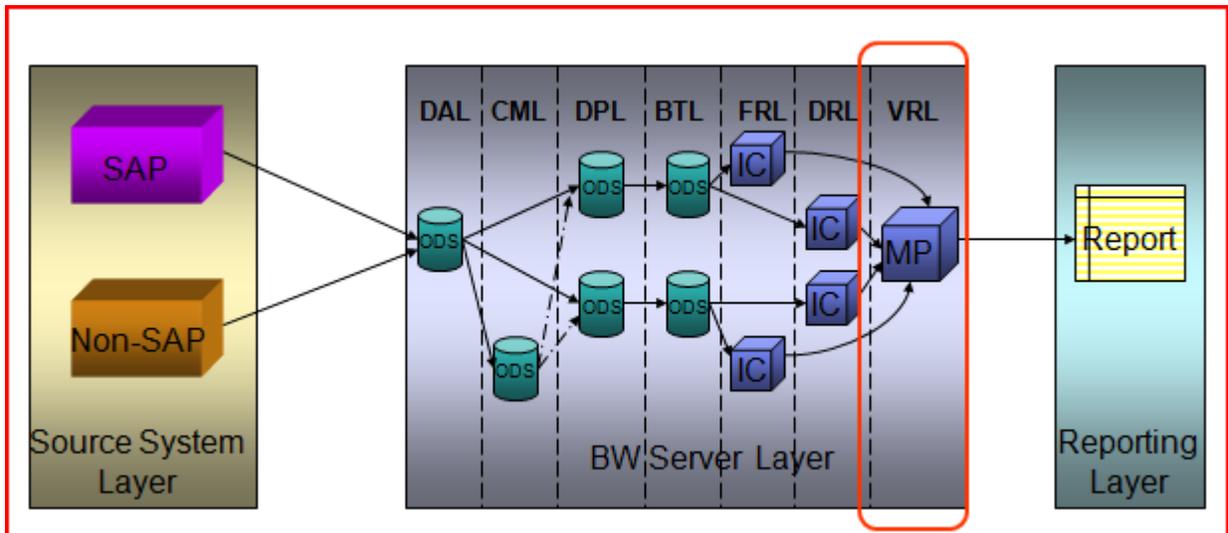
- This layer is optional and contains ODSes or info cubes with logic data split
- Data life is 1 years
- Will get data from DPL or BTL as Delta load
- Will be used for holding detailed level data

Dimensional Reporting Layer (DRL)



- This layer is mandatory and contains info cubes with logic data split
- Data life is 1 years
- Will get data from BTL as Delta load
- Will be used for holding summarized level data

Virtual Reporting Layer

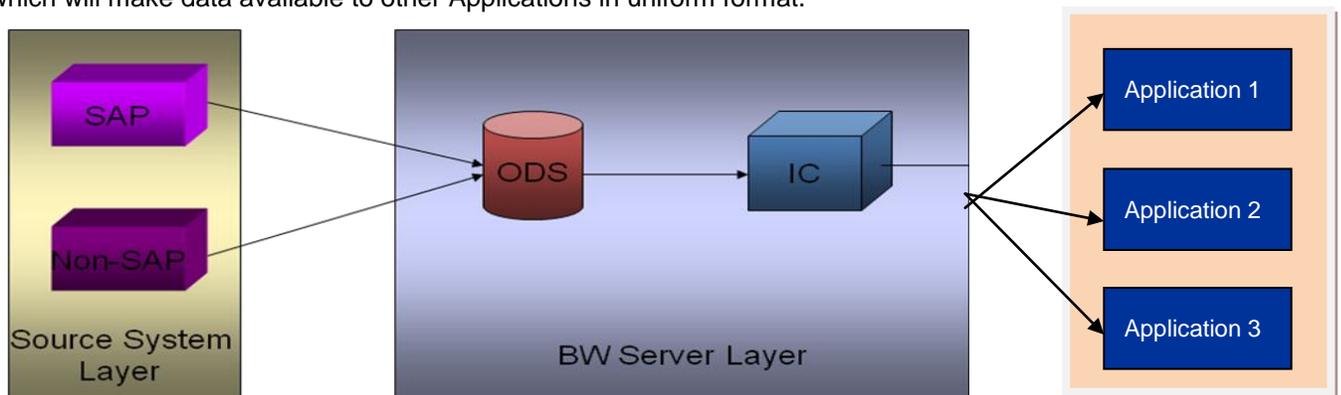


- This layer is mandatory and contains Multiproviders
- Will get data from FRL and DRL
- The info object ZTIMEZONE is added as data fields to all virtual reporting info providers

Further performance boosting of LSA Implementation using following techniques

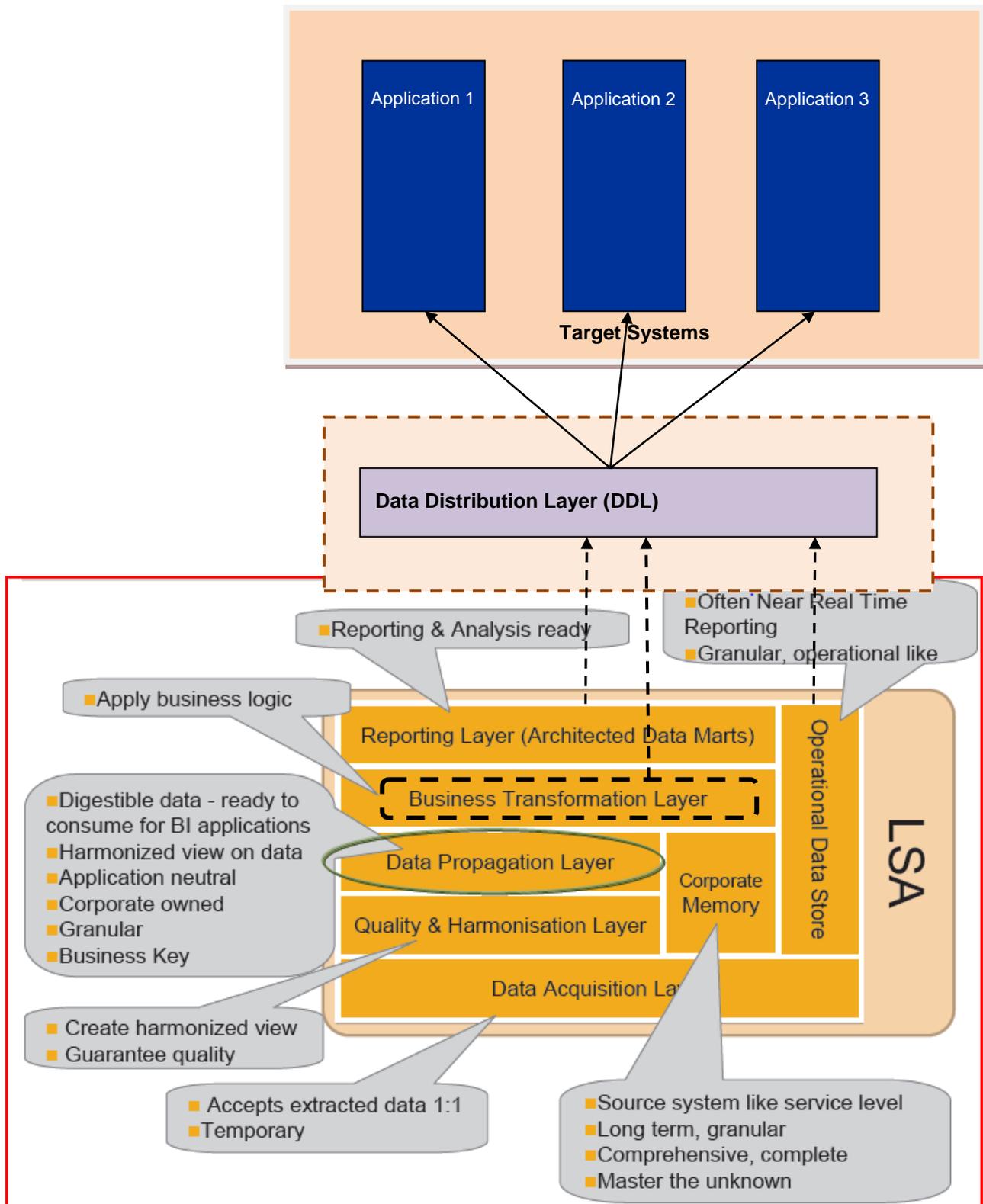
- Overall system performance can be improved by implementing the NLS archiving strategy across different layers of BWSP
- Use of write optimized DSO in DAL and CML

The LSA has been proposed with the thought that SAP BW / BI will be the final destination for all Kind of data that will be reported out for analysis. But in real life scenarios, we can see that SAP BW/BI will act as single point of contact for all kind of information for analysis also for exporting it to other system which will use them for their applications. Therefore in later case BW system will act as Central Reference System which will make data available to other Applications in uniform format.



Therefore we are introduction one more layer in existing LSA Architecture called Data Distribution Layer (DDL). This layer will be on top of reporting layer of LSA and will make data available to other systems.

Revised LSA



Data Distribution Layer (DDL)

Data Distribution Layer will mainly contain info provider holding data in required format as requested by various external applications and Open Hub Destination (OHD) which will take data from these info providers. Info providers of this layer will get data from Architected data marts (DRL and FRL) or from BTL layer ODSes. All data elements from source will be selected and when data is moving from these source layer to target layer, data will be formatted in routines. Finally we will have a complete set of data elements in required format to serve it to external applications.

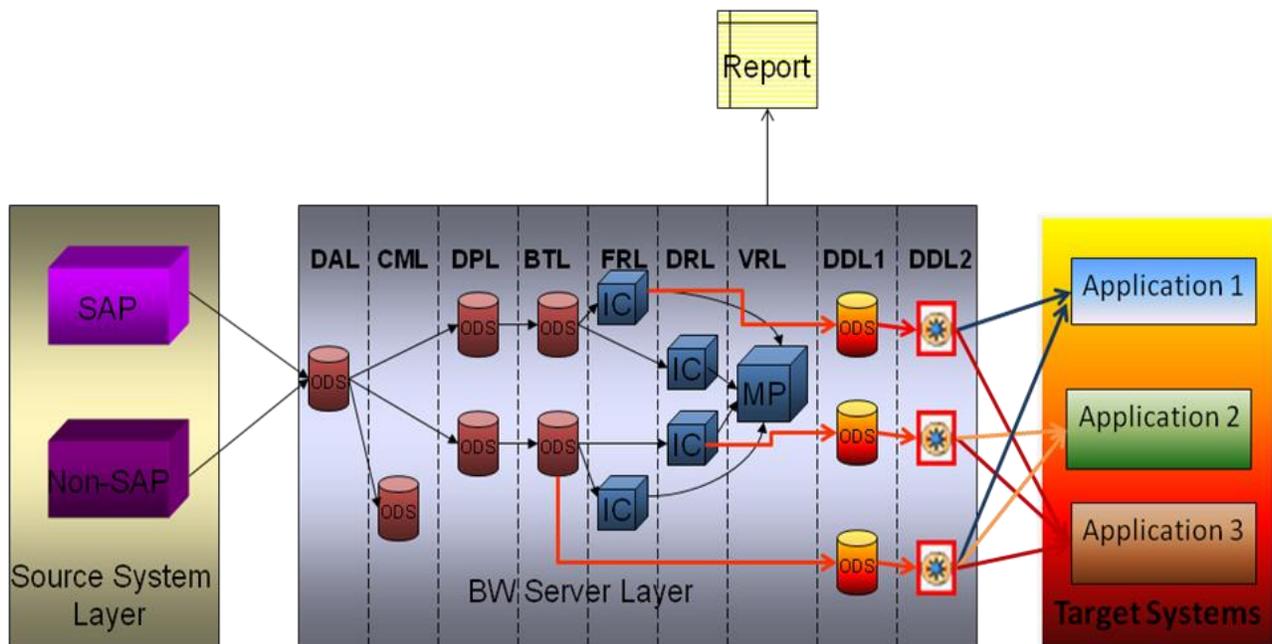
Data Distribution Layer(DDL) can be subdivided into two logical layers

DDL1 : This layer will have info providers which will hold data in format as requested by external Applications i.e. "Ready to serve data". This Layer will get data from DRL, FRL or BTL and will implement the formatting logic in routines. Also it will hold only that set of data which will be exported out from BI system to external applications. There will be no BI reporting from this layer info provider.

For implementing this layer most suitable info provider type will be write optimized DSO. But you can choose other for your specific requirement.

DDL2 : This layer will have Open Hub Destinations (OHD) which will take data from DDL1 info providers and made it available to external Applications through interface. The interfacing technology could be XI, TIBCO, ABAP Wrapper program etc.

This layer will be the Optional layer and it will be used only if your BW / BI system is acting as source of data for other external applications.



Related Content

[SAP NetWeaver BW Layered, Scalable Architecture \(LSA\) for BI Excellence - Webinar Presentation by Juergen HauptSAP](#)

For more information, visit the [EDW homepage](#).

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