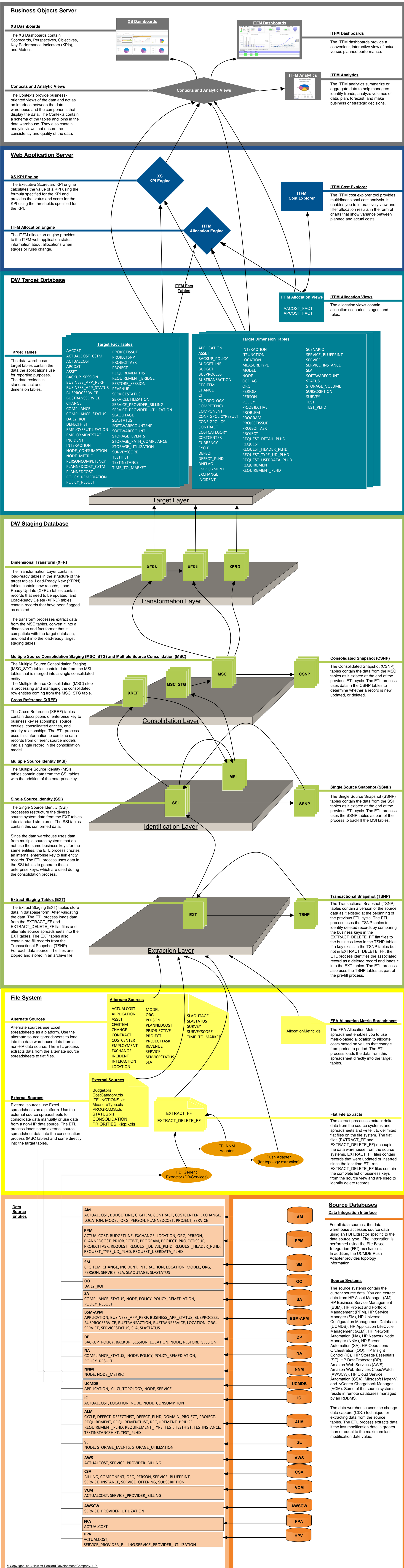


ETL Process and Architectural Overview



Business Objects Server

XS Dashboards
The XS Dashboards contain Scorecards, Perspectives, Objectives, Key Performance Indicators (KPIs), and Metrics.

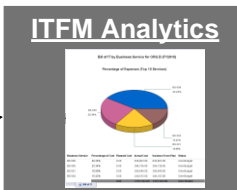


ITFM Dashboards
The ITFM dashboards provide a convenient, interactive view of actual versus planned performance.

Contexts and Analytic Views

The Contexts provide business-oriented views of the data and act as an interface between the data warehouse and the components that display the data. The Contexts contain a schema of the tables and joins in the data warehouse. They also contain analytic views that ensure the consistency and quality of the data.

Contexts and Analytic Views

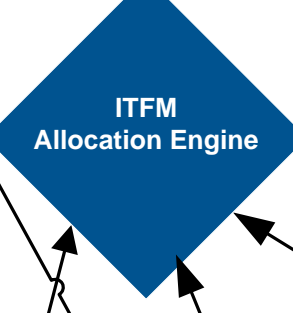
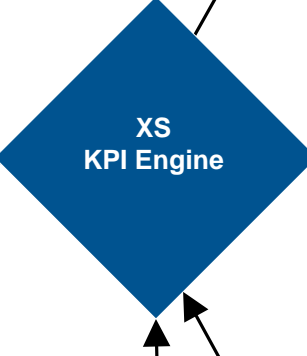


ITFM Analytics
The ITFM analytics summarize or aggregate data to help managers identify trends, analyze volumes of data, plan, forecast, and make business or strategic decisions.

Web Application Server

XS KPI Engine

The Executive Scorecard KPI engine calculates the value of a KPI using the formula specified for the KPI and provides the status and score for the KPI using the thresholds specified for the KPI.



ITFM Cost Explorer
The ITFM cost explorer tool provides multidimensional cost analysis. It enables you to interactively view and filter allocation results in the form of charts that show variance between planned and actual costs.

ITFM Allocation Engine

The ITFM allocation engine provides to the ITFM web application status information about allocations when stages or rules change.

DW Target Database

Target Tables

The data warehouse target tables contain the data the applications use for reporting purposes. The data resides in standard fact and dimension tables.

Target Fact Tables		Target Dimension Tables	
AACOST	PROJECTISSUE	APPLICATION	INTERACTION
ACTUALCOST_CSTM	PROJECTSNP	ASSET	ITFUNCTION
ACTUALCOST	PROJECTTASK	BACKUP_POLICY	LOCATION
APCOST	PROJECT	BUDGETLINE	MEASURETYPE
ASSET	REQUIREMENTHIST	BUDGET	MODEL
BACKUP_SESSION	REQUIREMENT_BRIDGE	BUSPROCESS	NODE
BUSINESS_APP_PERF	RESTORE_SESSION	BUSTRANSACTION	OCFLAG
BUSINESS_APP_STATUS	REVENUE	CFGITEM	ORG
BUSPROCSERVICE	SERVICESTATUS	CHANGE	PERIOD
BUSTRANSSERVICE	SERVICEUTILIZATION	CI	PERSON
CHANGE	SERVICE_PROVIDER_BILLING	CI_TOPOLOGY	POLICY
COMPLIANCE	SERVICE_PROVIDER_UTILIZATION	COMPETENCY	PROBJECTIVE
COMPLIANCE_STATUS	SLAOUTAGE	COMPONENT	PROBLEM
DAILY_ROI	SLASTATUS	CONFIGPOLICYRESULT	PROGRAM
DEFECTHIST	SOFTWARECOUNTSNP	CONFIGPOLICY	PROJECTISSUE
EMPLOYEEUTILIZATION	SOFTWARECOUNT	CONTRACT	PROJECTTASK
EMPLOYMENTSTAT	SOFTWAREEVENTS	COSTCATEGORY	REQUEST_DETAIL_PLHD
INCIDENT	STORAGE_EVENTS	COSTCENTER	REQUEST
INTERACTION	STORAGE_PATH_COMPLIANCE	CURRENCY	REQUEST_HEADER_PLHD
INTERACTION	STORAGE_UTILIZATION	CYCLE	REQUEST_TYPE_UD_PLHD
NODE_CONSUMPTION	SURVEYSORE	DEFECT	REQUEST_USERDATA_PLHD
NODE_METRIC	TESTHIST	DEFECT_PLHD	REQUIREMENT
PERSON_COMPETENCY	TESTINSTANCE	DNFLAG	REQUIREMENT_PLHD
PLANNEDCOST_CSTM	TIME_TO_MARKET	EMPLOYMENT	
PLANNEDCOST		EXCHANGE	
POLICY_REMEDIATION		INCIDENT	
POLICY_RESULT			

ITFM Fact Tables

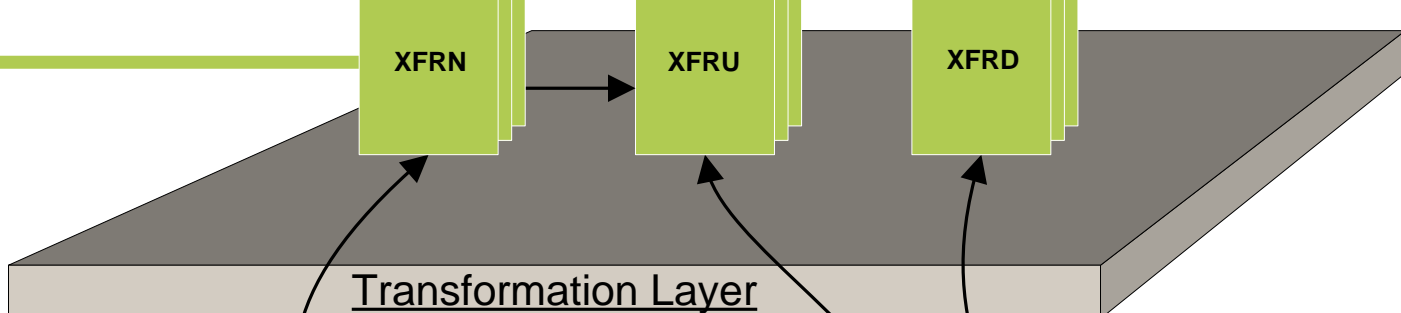


ITFM Allocation Views
The allocation views contain allocation scenarios, stages, and rules.

DW Staging Database

Dimensional Transform (XFR)

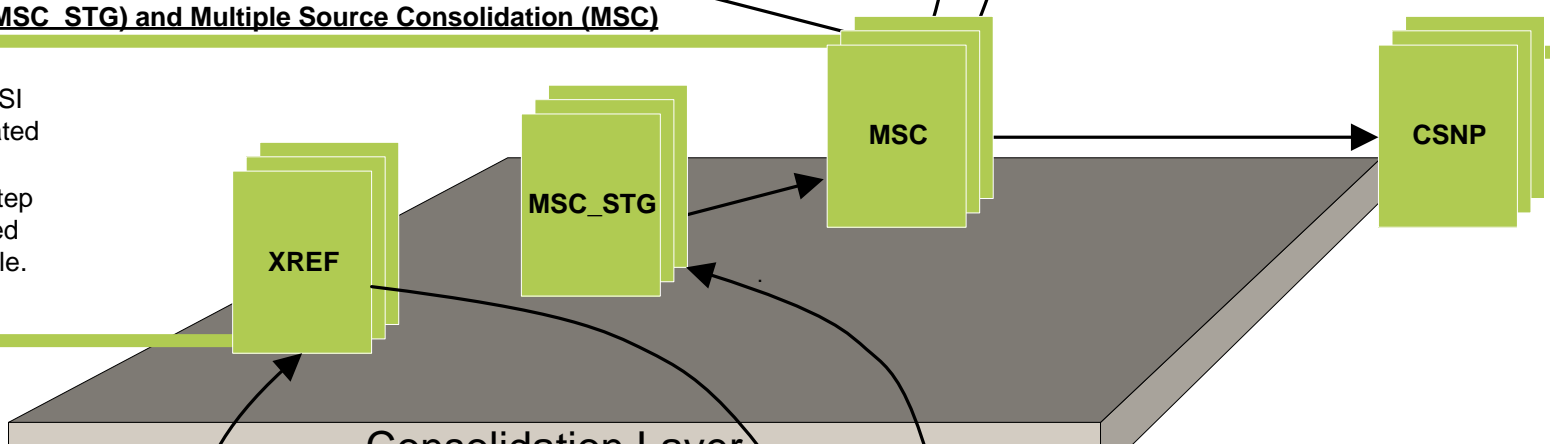
The Transformation Layer contains load-ready tables in the structure of the target tables. Load-Ready New (XFRN) tables contain new records. Load-Ready Update (XFRU) tables contain records that need to be updated, and Load-Ready Delete (XFRD) tables contain records that have been flagged as deleted.



Multiple Source Consolidation Staging (MSC_STG) and Multiple Source Consolidation (MSC)

The Multiple Source Consolidation Staging (MSC_STG) tables contain data from the MSI tables that is merged into a single consolidated entity.

The Multiple Source Consolidation (MSC) step is processing and managing the consolidated row entities coming from the MSC_STG table.



Consolidated Snapshot (CSNP)

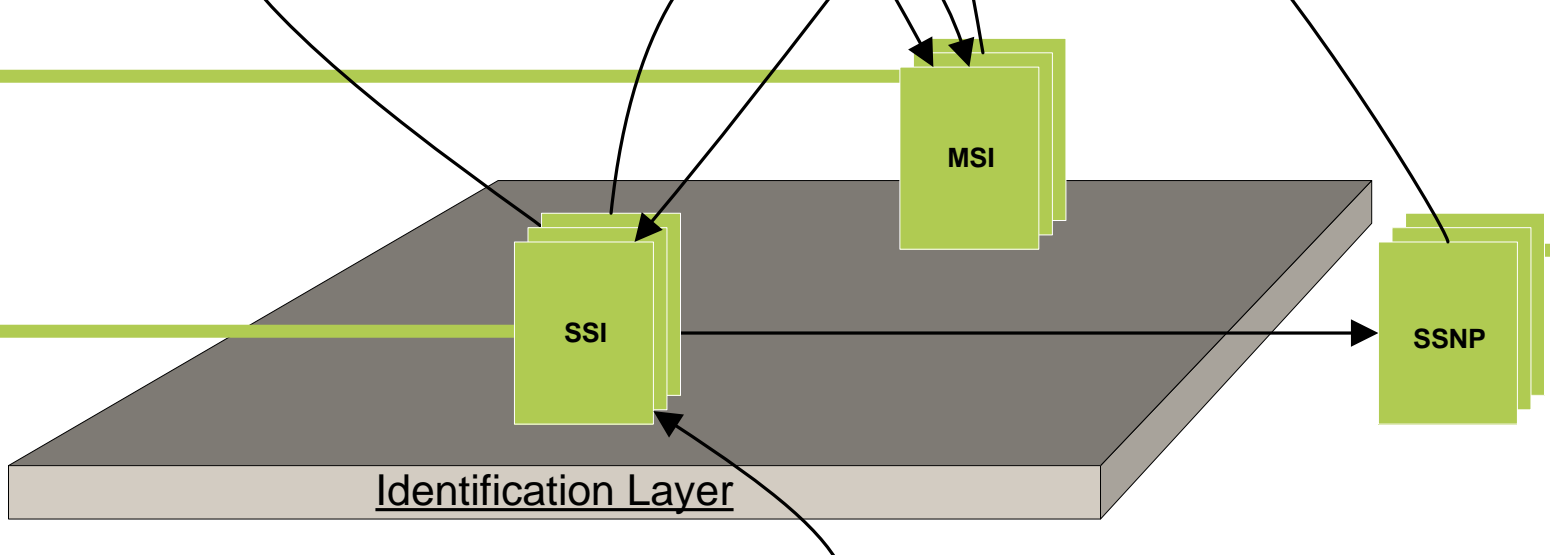
The Consolidated Snapshot (CSNP) tables contain the data from the MSC tables as it existed at the end of the previous ETL cycle. The ETL process uses data in the CSNP tables to determine whether a record is new, updated, or deleted.

Cross Reference (XREF)

The Cross Reference (XREF) tables contain descriptions of enterprise key to business key relationships, source entities, consolidated entities, and priority relationships. The ETL process uses this information to combine data records from different source models into a single record in the consolidation model.

Multiple Source Identity (MSI)

The Multiple Source Identity (MSI) tables contain data from the SSI tables with the addition of the enterprise key.

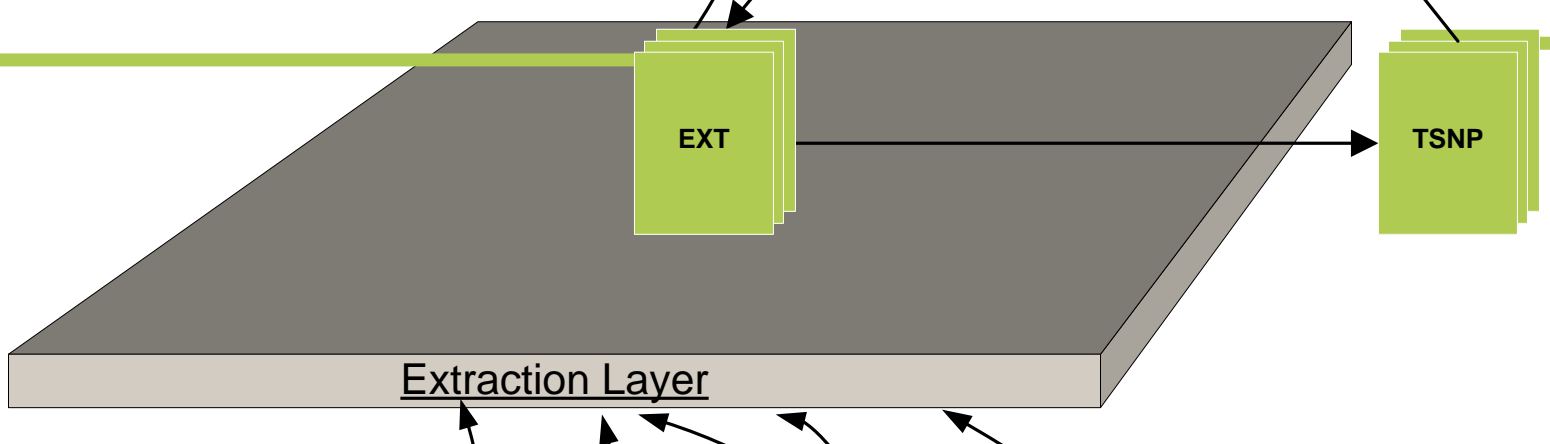


Single Source Snapshot (SSNP)

The Single Source Snapshot (SSNP) tables contain the data from the SSI tables as it existed at the end of the previous ETL cycle. The ETL process uses the SSNP tables as part of the process to backfill the MSI tables.

Extract Staging Tables (EXT)

The Extract Staging (EXT) tables store data in database form. After validating the data, the ETL process loads data from the EXTRACT_DELETE_FF flat files and EXTRACT_DELETE_FF flat files and alternate source spreadsheets into the EXT tables. The EXT tables also contain pre-fill records from the Transactional Snapshot (TSNP).



Transactional Snapshot (TSNP)

The Transactional Snapshot (TSNP) tables contain a version of the source data as it existed at the beginning of the previous ETL cycle. The ETL process uses the TSNP tables to identify deleted records by comparing the business keys in the EXTRACT_DELETE_FF flat files to the business keys in the TSNP tables. If a key exists in the TSNP tables but not in the EXTRACT_DELETE_FF flat files, the ETL process identifies the associated record as a deleted record and loads it into the EXT tables. The ETL process also uses the TSNP tables as part of the pre-fill process.

File System

Alternate Sources

ACTUALCOST	MODEL	SLAOUTAGE
APPLICATION	ORG	SLASTATUS
ASSET	PERSON	SURVEYSORE
CFGITEM	PLANNEDCOST	TIME_TO_MARKET
CHANGE	PROBJECTIVE	
CONTRACT	PROJECT	
COSTCENTER	PROJECTTASK	
EMPLOYMENT	REVENUE	
EXCHANGE	SERVICESTATUS	
INCIDENT	SLA	
INTERACTION		
LOCATION		

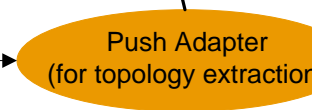
FPA Allocation Metric Spreadsheet
The FPA Allocation Metric spreadsheet enables you to use metric-based allocation to allocate costs based on values that change from period to period. The ETL process loads the data from this spreadsheet directly into the target tables.

External Sources

- Budget.xls
- CostCategory.xls
- ITFUNCTIONS.xls
- MeasureType.xls
- PROGRAMS.xls
- STATUS.xls
- CONSOLIDATION_PRIORITIES_<icp>.xls



Flat File Extracts
The extract processes extract delta data from the source systems and spreadsheets and write it to delimited flat files on the file system. The flat files (EXTRACT_FF and EXTRACT_DELETE_FF) decouple the data warehouse from the source systems. EXTRACT_FF files contain records that were updated or inserted since the last time ETL ran. EXTRACT_DELETE_FF files contain the complete list of business keys from the source view and are used to identify delete records.



Data Source Entities

AM ACTUALCOST, BUDGETLINE, CFGITEM, CONTRACT, COSTCENTER, EXCHANGE, LOCATION, MODEL, ORG, PERSON, PLANNEDCOST, PROJECT, SERVICE	AM
PPM ACTUALCOST, BUDGETLINE, EXCHANGE, LOCATION, ORG, PERSON, PLANNEDCOST, PROBJECTIVE, PROGRAM, PROJECT, PROJECTISSUE, PROJECTTASK, REQUEST, REQUEST_DETAIL_PLHD, REQUEST_HEADER_PLHD, REQUEST_TYPE_UD_PLHD, REQUEST_USERDATA_PLHD	PPM
SM CFGITEM, CHANGE, INCIDENT, INTERACTION, LOCATION, MODEL, ORG, PERSON, SERVICE, SLA, SLAOUTAGE, SLASTATUS	SM
OO DAILY_ROI	OO
SA COMPLIANCE_STATUS, NODE, POLICY, POLICY_REMEDIATION, POLICY_RESULT	SA
BSM-APM APPLICATION, BUSINESS_APP_PERF, BUSINESS_APP_STATUS, BUSPROCESS, BUSPROCSERVICE, BUSTRANSACTION, BUSTRANSSERVICE, LOCATION, ORG, SERVICE, SERVICESTATUS, SLA, SLASTATUS	BSM-APM
DP BACKUP_POLICY, BACKUP_SESSION, LOCATION, NODE, RESTORE_SESSION	DP
NA COMPLIANCE_STATUS, NODE, POLICY, POLICY_REMEDIATION, POLICY_RESULT	NA
NNM NODE, NODE_METRIC	NNM
UCMDB APPLICATION, CI, CI_TOPOLOGY, NODE, SERVICE	UCMDB
IC ACTUALCOST, LOCATION, NODE, NODE_CONSUMPTION	IC
ALM CYCLE, DEFECT, DEFECTHIST, DEFECT_PLHD, DOMAIN_PROJECT, PROJECT, REQUIREMENT, REQUIREMENTHIST, REQUIREMENT_BRIDGE, REQUIREMENT_PLHD, REQUIREMENT_TYPE, TEST, TESTHIST, TESTINSTANCE, TESTINSTANCEHIST, TEST_PLHD	ALM
SE NODE, STORAGE_EVENTS, STORAGE_UTILIZATION	SE
AWS ACTUALCOST, SERVICE_PROVIDER_BILLING	AWS
CSA BILLING_COMPONENT, OEG, PERSON, SERVICE_BLUEPRINT, SERVICE_INSTANCE, SERVICE_OFFERING, SUBSCRIPTION	CSA
VCM ACTUALCOST, SERVICE_PROVIDER_BILLING	VCM
AWSCW SERVICE_PROVIDER_UTILIZATION	AWSCW
FPA ACTUALCOST	FPA
HPV ACTUALCOST, SERVICE_PROVIDER_BILLING, SERVICE_PROVIDER_UTILIZATION	HPV

Source Databases

Data Integration Interface

For all data sources, the data warehouse accesses source data using an FBI Extractor specific to the data source type. The integration is performed using the File Based Integration (FBI) mechanism. In addition, the UCMDB Push Adapter provides topology information.

Source Systems

The source systems contain the current source data. You can extract data from HP Asset Manager (AM), HP Business Service Management (BSM), HP Project and Portfolio Management (PPM), HP Service Manager (SM), HP Universal Configuration Management Database (UCMDB), HP Application Lifecycle Management (ALM), HP Network Automation (NA), HP Network Node Management (NNM), HP Server Automation (SA), HP Operations Orchestration (OO), HP Insight Control (IC), HP Storage Essentials (SE), HP DataProtector (DP), Amazon Web Services (AWS), Amazon Web Services CloudWatch (AWSCW), HP Service Cloud Automation (CSA), Microsoft Hyper-V, and vCenter Chargeback Manager (VCM). Some of the source systems reside in remote databases managed by an RDBMS.

The data warehouse uses the change data capture (CDC) technique for extracting data from the source tables. The ETL process extracts data if the last modification date is greater than or equal to the maximum last modification date value.

