

Лекция №6

OLAP

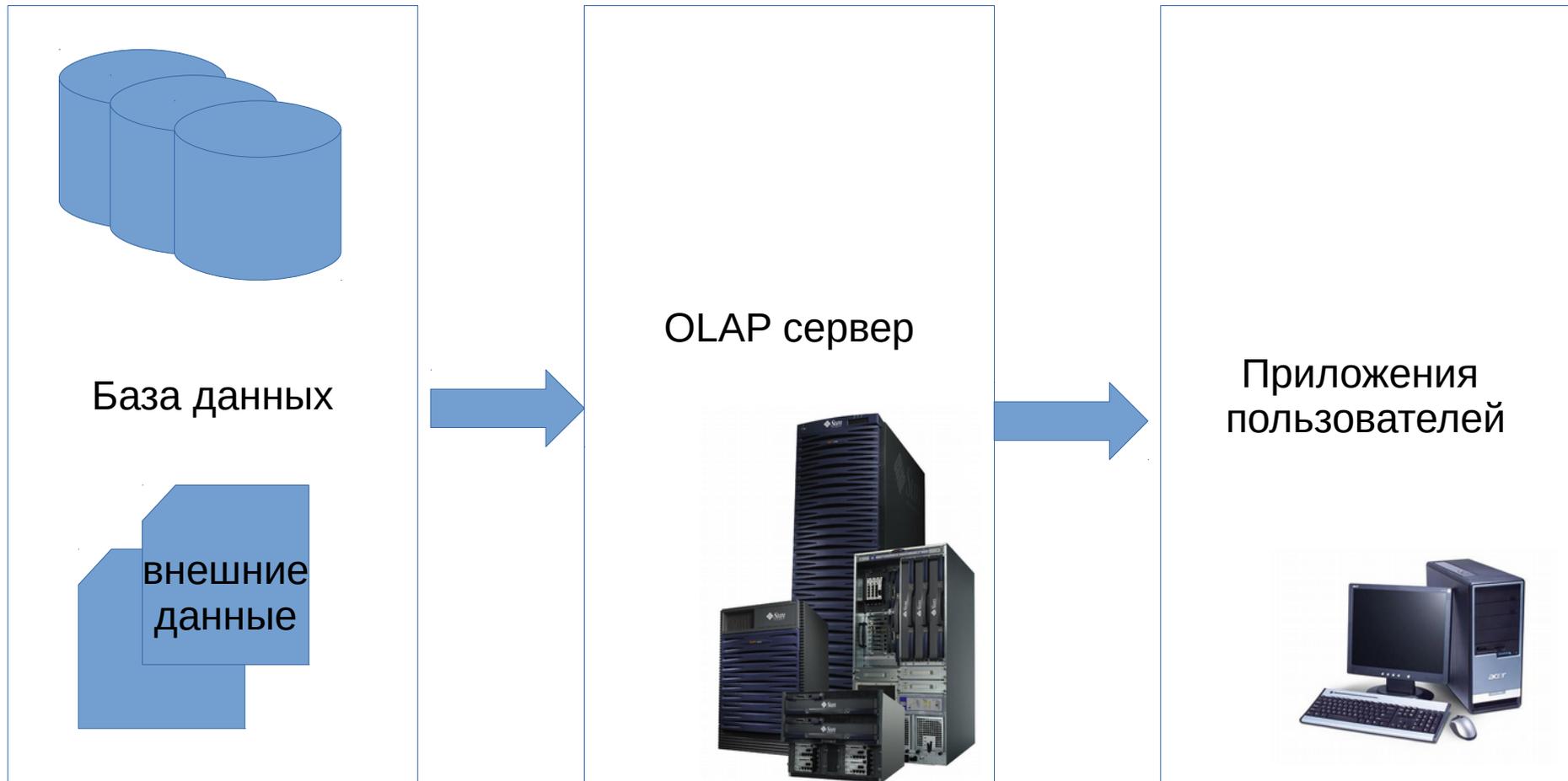
OLTP / OLAP

Сильно нормализованные модели данных хорошо подходят для так называемых *OLTP-приложений* (*On-Line Transaction Processing (OLTP)*- *оперативная обработка транзакций*).

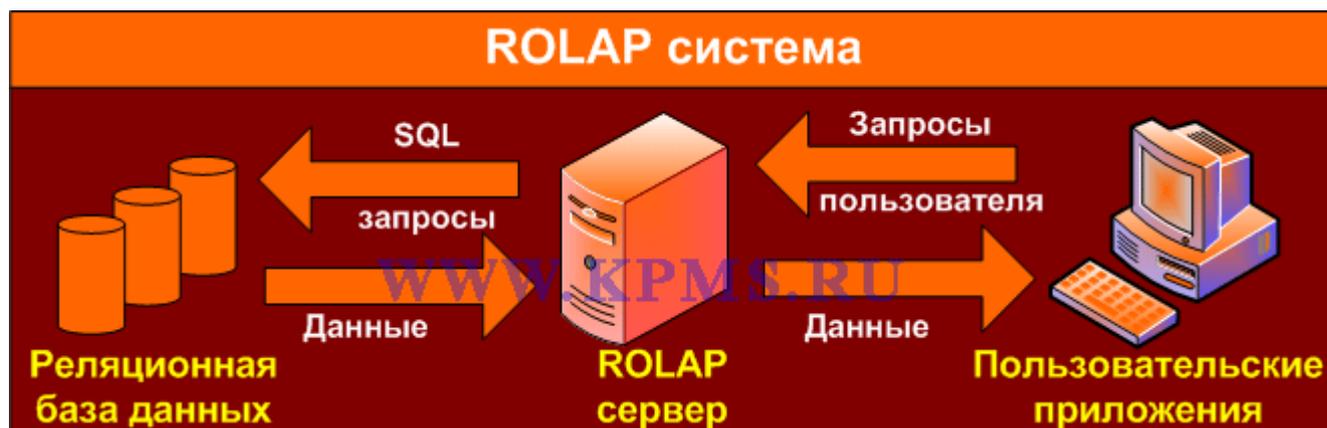
OLTP / OLAP

Другим типом приложений являются так называемые *OLAP-приложения (On-Line Analytical Processing (OLAP) - оперативная аналитическая обработка данных)*. Это обобщенный термин, характеризующий принципы построения *систем поддержки принятия решений (Decision Support System- DSS), хранилищ данных (Data Warehouse), систем интеллектуального анализа данных (Data Mining)*.

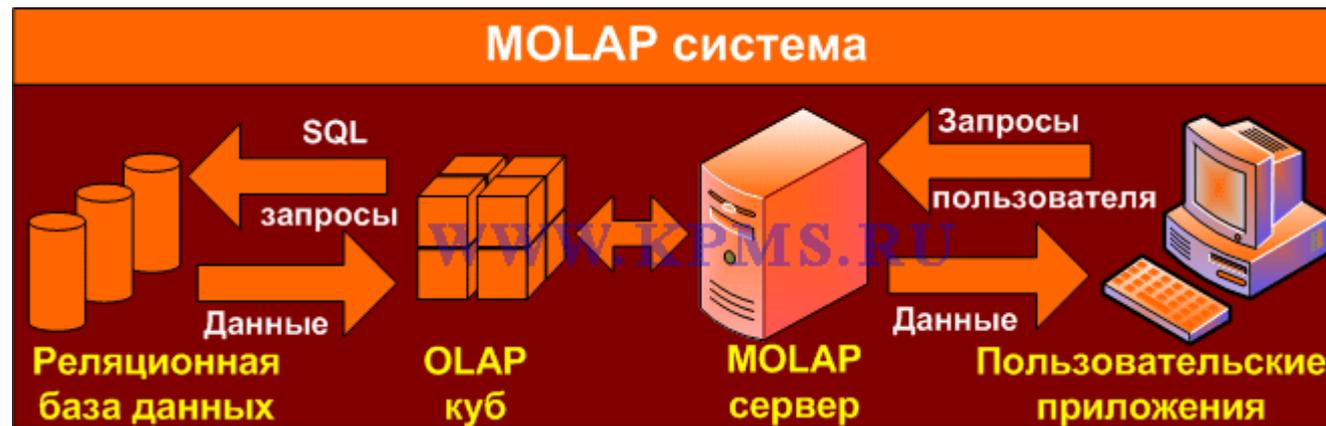
Структура OLAP системы



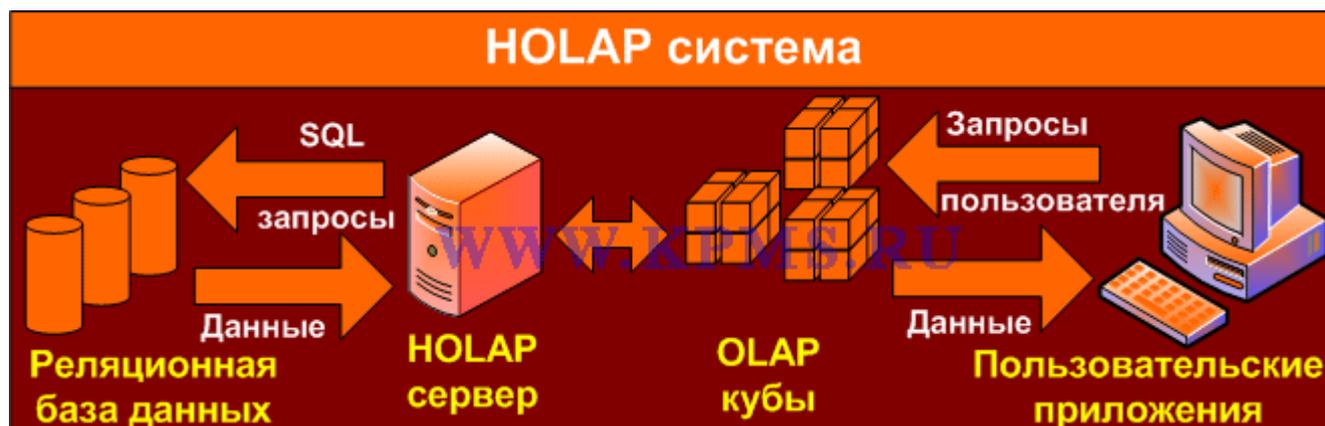
ROLAP



MOLAP



HOLAP



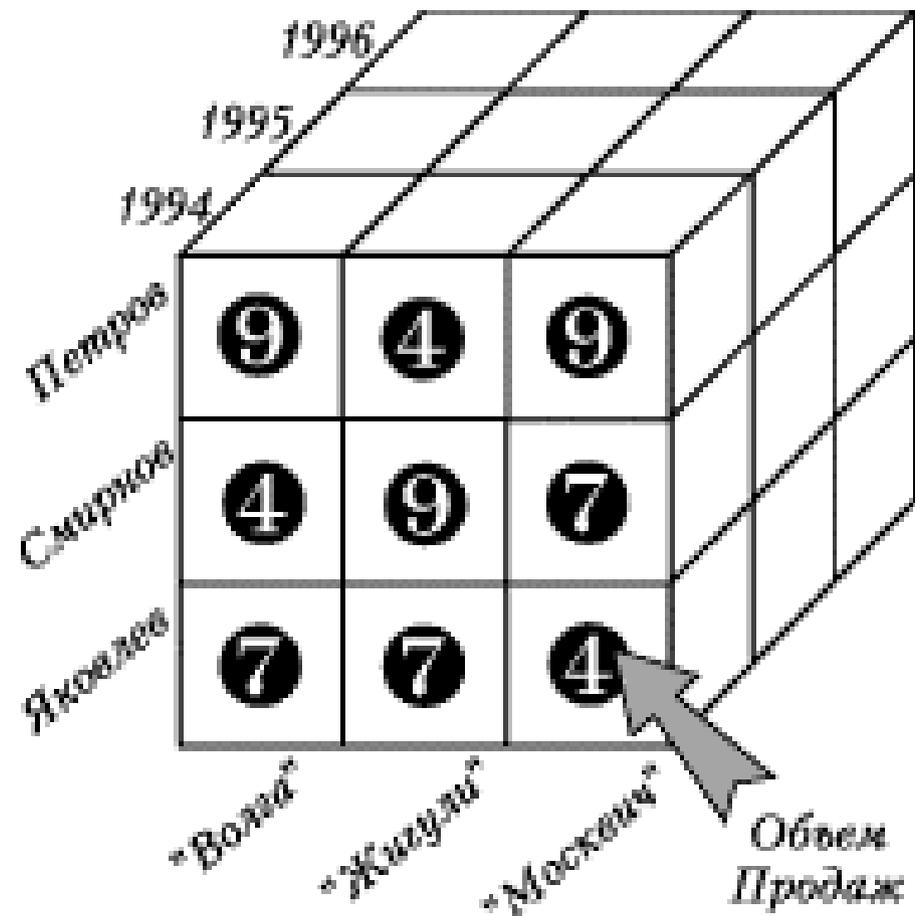
Другие OLAP

- WOLAP
- DOLAP
- MobileOLAP
- SOLAP
- RTOLAP

Основные преимущества

- согласованность исходной информации и результатов анализа;
- проведение многовариантного анализа;
- управление детализацией;
- выявление скрытых зависимостей;
- создание единой платформы.

Основные понятия



OLAP системы

OLAP Server ⇄	Company ⇄	Website ⇄	Latest stable version ⇄	Software license ⇄	License Pricing ⇄
IBM Cognos TM1	IBM	[1]	10.2.2 FP4	Proprietary	-
Essbase	Oracle	[2]	11.1.2.4	Proprietary	[1]🔗
icCube	icCube	[3]	6.0	Proprietary	community/[2]🔗
Jedox OLAP Server	Jedox	[4]	7.0	GPL v2 or EULA, Proprietary	[3]🔗
Infor BI OLAP Server	Infor	[5]	10.6.0	Proprietary	-
Microsoft Analysis Services	Microsoft	[6]	2016	Proprietary	[4]🔗
MicroStrategy Intelligence Server	MicroStrategy	[7]	9	Proprietary	-
Mondrian OLAP server	Pentaho	[8]	3.7	EPL	free
Oracle Database OLAP Option	Oracle	[9]	11g R2	Proprietary	[5]🔗
SAS OLAP Server	SAS Institute	[10]	9.4	Proprietary	-
SAP NetWeaver BW	SAP	[11]	7.30	Proprietary	-
Cubes	Open source community	[12]	1.0.1	MIT	-

OLAP системы / Data storage

OLAP Server ⇄	MOLAP ⇄	ROLAP ⇄	HOLAP ⇄	In-Memory ⇄	Offline ⇄
IBM Cognos TM1	Yes	No	No	No	Cognos Insight Distributed mode ↗
Essbase	Yes	No	No	No	
icCube	Yes	No	No		Offline Cubes ↗
Infor BI OLAP Server	Yes	No	No	Yes	Local cubes
Jedox OLAP Server	Yes	No	No	Yes	No
Microsoft Analysis Services	Yes	Yes	Yes	Yes	Local cubes, PowerPivot for Excel, Power BI Desktop
MicroStrategy Intelligence Server	Yes	Yes	Yes	No	MicroStrategy Office ↗ , Dynamic Dashboards ↗
Mondrian OLAP server	No	Yes	No	No	
Oracle Database OLAP Option	No	Yes	No	No	
SAS OLAP Server	Yes	Yes	Yes	No	
IBM Cognos BI	Yes	Yes	Yes	No	
SAP NetWeaver BW	Yes	Yes	No	No	
Cubes (OLAP server)	No	Yes	No		

OLAP системы / API

OLAP Server	XML for Analysis	OLE DB for OLAP	MDX	Stored procedures	Custom functions	SQL	LINQ ^[13]	Visualization	JSON	REST API
Essbase	Yes	Yes	Yes	Yes	Yes	No	Yes	SmartView (Excel-AddIn), WebAnalysis, Financial Reports	?	?
icCube	Yes	Yes	Yes	Java, ^[14] R ^[15]	Yes	No	Yes	Java, Javascript	?	?
Infor BI OLAP Server	Yes	Yes	Yes	OLAP Rules, Push Rules, Application Engine	Yes	Yes	No	Application Studio	?	?
Jedox OLAP Server	Yes	Yes	Yes	Cube Rules, SVS Triggers	Yes	No	Yes	Microsoft Excel, Qlik, Tableau, Jedox Web, Power BI	No	Yes
Microsoft Analysis Services	Yes	Yes	Yes	.NET ^[16]	Yes ^[17]	Yes ^[18]	Yes	Microsoft Excel, SharePoint, Microsoft Power BI, and 70+ other visualization tools ^[19]	?	?
MicroStrategy Intelligence Server	Yes	No	Yes	Yes	Yes	Yes	Yes	?	?	?
Mondrian OLAP server	Yes	Yes ^[20]	Yes	Yes	Yes ^[21]	Yes	Yes	No	?	?
Oracle Database OLAP Option	No	Yes ^[22]	Yes ^[22]	Java, PL/SQL, OLAP DML	Yes	Yes ^[23]	No	?	?	?
SAS OLAP Server	Yes	Yes	Yes	No	No	No	Yes	Web Report Studio	?	?
SAP NetWeaver BW	Yes	Yes	Yes	No	Yes	No	Yes	?	?	?
Cognos TM1	Yes	Yes	Yes	Yes	Yes	No	Yes	TM1 Web/TM1 Contributor, IBM Cognos Insight, IBM Performance Modeler, IBM Cognos Cafe for Excel, Cognos BI, TM1 Perspectives for Excel	?	Yes
Cubes	No	No	No	No	Yes	No	No	Cubes Viewer ^[24]	Yes	?

OLAP системы / Доп.возможности

OLAP Server ⇄	Real Time ⇄	Write-back ⇄	Partitioning ⇄	Usage Based Optimizations ⇄	Load Balancing and Clustering ⇄
Essbase	No	Yes	Yes	Yes	Yes
icCube	Yes ^[25]	Yes ^[26]	Yes ^[27]	?	?
Infor BI OLAP Server	Yes	Yes	Yes	?	?
Jedox OLAP Server	Yes	Yes	Yes	?	?
Microsoft Analysis Services	Yes	Yes	Yes	Yes	Yes
MicroStrategy Intelligence Server	?	Yes ^[28]	Yes	?	?
Mondrian OLAP server	Yes	Planned	Yes	?	?
Oracle Database OLAP Option	?	Yes	Yes	No	?
IBM Cognos TM1	Yes	Yes	Yes	?	?
IBM Cognos BI	Yes	No	Yes	Yes	?
SAS OLAP Server	?	Yes	Yes	?	?
SAP NetWeaver BW	?	Yes	Yes	?	?
Cubes	?	?	?	?	?

OLAP системы / Доп.возможности

OLAP Server ⇄	Semi-additive measures ⇄	Many-to-Many ⇄	Multi-Cube Model ⇄	Perspectives ⇄	KPI ⇄	Translations ⇄	Named Sets ⇄	Multi-attribute Hierarchies ⇄	Actions ⇄
Essbase	Yes	?	?	?	Yes	Yes	Yes	Yes	?
icCube	Yes ^[29]	Yes ^[30]	Yes	?	?	?	?	?	?
Infor BI OLAP Server	Yes	?	Yes	?	Yes	?	?	?	?
Jedox OLAP Server	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	?
Microsoft Analysis Services	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MicroStrategy Intelligence Server	Yes	?	?	?	?	?	?	?	?
Mondrian OLAP server	Yes ^[31]	?	?	?	?	?	?	?	?
Oracle Database OLAP Option	Yes	?	?	?	?	?	?	?	?
IBM Cognos TM1	Yes	Yes	Yes	?	?	?	?	?	?
IBM Cognos BI	Yes	Yes	?	?	?	?	Yes	Yes	?
SAS OLAP Server	Yes	?	?	?	?	?	?	?	?
SAP NetWeaver BW	Yes	?	?	?	?	?	?	?	?
Cubes	?	Yes	?	?	?	?	?	?	?

OLAP системы / ОС

OLAP Server ⇄	Windows ⇄	Linux ⇄	UNIX ⇄	z/OS ⇄	AIX ⇄
Essbase	Yes	Yes	Yes	No	
icCube	Yes	Yes	Yes	Yes	Yes
Infor BI OLAP Server	Yes	No	No	No	
Jedox OLAP Server	Yes	Yes	Yes	No	
Microsoft Analysis Services	Yes	No	No	No	
MicroStrategy Intelligence Server	Yes	Yes	Yes	No	
Mondrian OLAP server	Yes	Yes	Yes	Yes	
Oracle Database OLAP Option	Yes	Yes	Yes	Yes	
SAS OLAP Server	Yes	Yes	Yes	Yes	
SAP NetWeaver BW	Yes	Yes	Yes	Yes	
IBM Cognos TM1	Yes	Yes	Yes	No	Yes
Cubes	Yes	Yes	Yes	No	

ИСТОЧНИКИ

- <http://www.tadviser.ru/index.php/%D0%A1%D1%82%D0%B0%D1%82%D1%8C%D1%8F:OLAP-%D1%81%D0%B8%D1%81%D1%82%D0%B5%D0%BC%D1%8B>
- http://www.kpms.ru/Automatization/OLAP_system.htm
- <http://www.olap.ru/basic/>
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