"SAP HANA DATABASE WITH NETWORK"

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ABSTRACT: *SAP HANA Database is stand for system, application and processing on database with High performance Analytic Appliance. SAP HANA core database can serve real-time, complex queries and multi structured data needs. Enterprise Requirement may increase day by day. In SAP HANA database no of user operate same data simultaneously. The goal of the SAP HANA database is the reduced the problem related with storage and workload within management system. By this reasons it have modern hardware with multiple processor, large main memory, and caches. SAP HANA database have various method for compression of database content [1].*

Keywords: SAP HANA, real time, multiple processor, cache, main memory.

1. INTRODUCTION

It is a combination of hardware and software made to handle both high transaction rate and complex query processing. SAP HANA previously called SAP High-Performance Analytic Appliance. In addition to database engine HANA include an embedded web server, Trex search engine an in memory column-oriented search engine [2]. SAP HANA has the cloud platform for the data storage. And hence the data is stored in secure and efficient way [3].

The SAP HANA has two type of connection to network:
1) Inbound connection.
2) Outbound connection

Inbound connections: In inbound connection for database clients and data provisioning it used the protocols SQLDBC by using port no.3xx15, 3xx17 and SAP HANA Studio operate administrative functions by using port no.5xx13, 5xx14, 1128, 1129.for the web base access of SAP HANA us done by using HTTP and HTTPS for this port no.80xx, 43xx is used[3].

Outbound connections: Outbound connection is used by the solution manager for the purpose of diagnostics agent installed on each system.

2. THE SAP HANA DATABASE WITH NETWORK CONNECTIVITY

Network is defined as the set of two or more number of computers that shared the information, resources to each other. An SAP HANA data centre database can running range from the single host to a complex distributed system having multiple hosts' location.

2.1 High availability and disaster recovery in SAP HANA: SAP HANA is fully designed have high availability. It supports recovery used for the detection of error related to the Software and other fault. High availability in SAP HANA IS derived from set of techniques, practices of engineer and design principles that fulfil the requirement of business continuity [4].

For achieved High availability in SAP HANA first it eliminating single points of failure as quickly and providing the ability to repair the fault. Fault recovery is the method of detection and correction of the fault. In disaster recovery it takes a backup of data. The backup is used at the time of data is loss due to some reasons like due to viruses, power supply fault.

2.2 Connectivity to Network: SAP HANA database has the client-server model of connectivity. SAP HANA is transaction-oriented databases because it used the replication services.

The setup of an SAP HANA depends on following things.

- It Support to traditional database clients, Web-based user, and admin.
- The number of client used to the SAP HANA system, ranging from a single-client system to a complex distributed system is responsible for provides an informational framework to use the most efficient channels of transmission information with a low error rate .with multiple clients.
- Support for high availability through the use of multiple technique, and support for disaster recovery datacentres with recovery methods.
- SAP HANA has number of network communication channels with the different SAP HANA setups.

- There is separate channels used for external access to SAP HANA function operate by end-user clients, administration clients, application servers, and for data providing via SQL or HTTP protocols.

For purpose of separate external and internal communication, SAP HANA hosts use a separate network adapter .network adapter means it is a board or PCMCLA card that have RAM, DSP chips and link interface with a separate logical address for each of the different networks. In addition, SAP HANA can be configured to use SSL (secure socket lock protocols for secure communication.

3. NETWORK ZONES

3.1 Client zone: In the simple means client is persons that use the facility provides by server. The is used by SAP application servers, by clients used client zone by SAP HANA studio or Web applications running With help of SAP HANA Extended service server, and for the storing historical data of user it used data warehouse[8].

3.2 Internal zone: This zone covers the inter host network between hosts which are in a distributed system and the SAP HANA system replication technique.

3.3 Storage zone: it is responsible data backup purpose.

.For the database connectivity SAP HANA database used following protocols.

4.1. SQLDBC: It stands for the SQL database connectivity. By using this protocol we can connect the database to the network. This protocol again has to type JBDC and OBDC. This protocols used by client and administer to database for connection.

- JDBC: Stand for JAVA database connectivity. This protocol is responsible for the client connects and access to the database.it used for the updating the database contain. The stored procedures are invoked by JDBC connection.
- ODBC: Stand for open database connectivity. This application which is written using the ODBC is ported to both client and server side. It used concept of DNS that is data source names. DNS collect the additional information about the particular source connection.

4.2 HTTP/HTTPS: HTTP is tends for hypertext transfer protocols and S is for the Secure. SAP HANA USED these protocols for connecting web application to the database. HTTP is reliable data transfer. HTTP used the port no.80xx.HTTP protocols used the TCP connection [9].

4.3 **SSL:** SSL stand for the secure sockets layer protocols. This is used for the secure communication between SAP
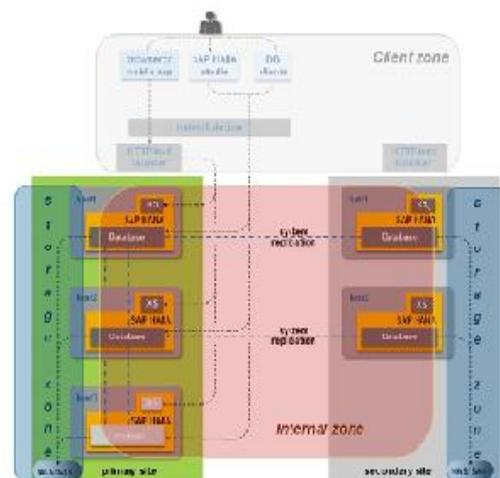

Figure: Network Zone.

3.4 Connections used by Database Clients and Web Clients to connect to the SAP HANA.
   Connection is as follows
- Administrative purposes connection.
- Data provisioning (providing) connection.
- Clients Connections from database that access the database by using SQL/MDX interface.

4. PROTOCOLS USED BY DATABASE FOR CONNECTING TO NETWORK

Protocols: A protocol is rules and regulation that govern the communication. Without protocols there is no communication HANA database and client. This protocol provides the authentication to server and data encryption. SSL used the port no 5xx13 and 5xx14.

Database Client Access:

Client	Protocols used by client	TCP port number
1. Client used the SAP HANA database as application. Example: Business Warehouse. 2. The user used SAP HANA directly Example: Microsoft Excel. 3. SAP HANA studio: SAPHANA	The protocol used for database client access is SQLDBC.	3 xx 15 3 xx 17

studio is administrative block		

Administrative Tasks:

Client	Protocols and other information	Port no.
1)SAP support	The internal SAP protocol is used.	3xx09
2)SAP HANA studio	The protocols is used by studio is SQLDBC. here the connection agent play role of administrator	5xx13 5xx14 (SSL)

5. SAP HANA SERVER

Server: Server is the any computer program or machines that accept the client request and give response. Main motto of server is to share resources and hardware between the clients. The SAP HANA has the following server.

Index Server: It is responsible for the storing of actual data and the engines for processing the data. It acts also as main server. User all the other servers coordinate by the server

Name Server: It is having responsibility to store the topology of Distributed SAP HANA database name server. The SAP HANA used by distributed system by using the instances number. Name server has information about the running component of SAP HANA database.

Statistics Server: It has information about Status about the Performance and Resource Consumption from all the other server components. For the access the Statistics Server there is used of the SAP HANA Studio.it monitor the entire server working.

Pre-processor Server: It is used for to find Text Data and extracting the information on which the text search capabilities are based [2].

6. NETWORK SECURITY

6.1 Authentication and Authorization: SAP HANA supports an authentication method. Authentication is method to provide a way of identifying a user. The most basic is username/ password combinations for database users created and maintained through the SAP HANA Studio [4].

6.2 Encryption: ENCRYPTION Is method of data hiding in the network .The secure sockets layer (SSL) protocol be used to encrypt client-server traffic and internal communications in SAP HANA. SSL is not invulnerable (not have any weakness). SSL proxies are widely available and can be used to encrypt and decrypt packets passed between endpoints within a network. Root encryption keys are stored using the SAP Net Weaver secure storage file system (SSFS). Keys should be periodically changed using the sql command alter system persistence encryption create new key followed by alter system persistence encryption apply current key [5].

6.3 Auditing And Logging: An audit also called audit log. The meaning of audit means recording the log file. Once enabled, audit policies should be configured to log actions that include SELECT, INSERT, UPDATE, DELETE, And EXECUTE and other quires when combined with specific conditions. Policies can be configured for specific users, tables, views and procedures. It is recommending auditing all actions performed by privileged users including the SYSTEM user and actions that impact sensitive database objects. SAP HANA database supports to recovery. In it database have one copy of original data if anyone make changes in it then data is match with copy [5].

7. CONCLUSION

The requirement of every organization is to have the powerful database for storage the SAP HANA provides all things that make organization best. The SAP HANA has one speciality that thousands of users may read or update records of the same data. SAP HANA provides the best security to data. As all organization give important to have the powerful network of database the SAP HANA fulfil all the requirement of organization. SAP HANA database with network connectivity give benefits to the organization.

8. REFERENCES

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