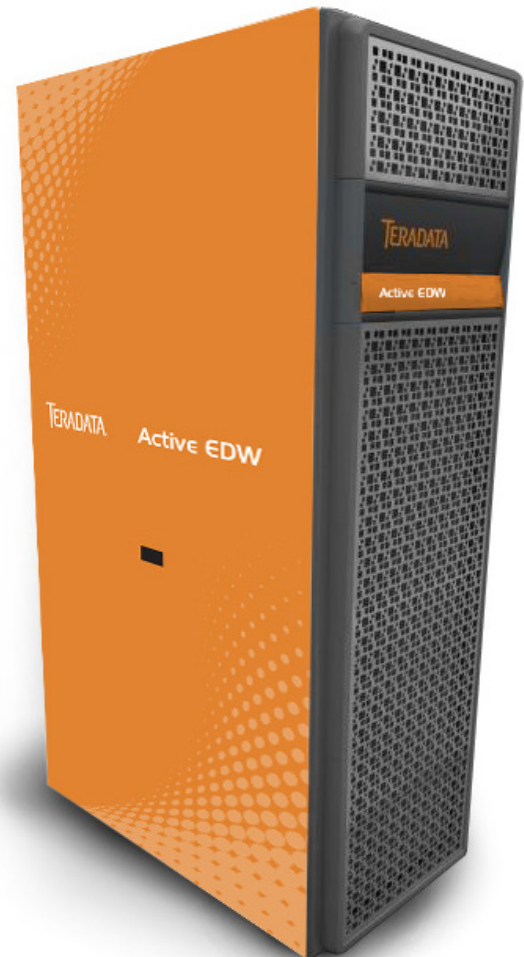# TERADATA ACTIVE ENTERPRISE DATA WAREHOUSE 6750

ACTIVE DATA WAREHOUSING PLATFORM FOR TERADATA SOLUTIONS

In today's fast-paced, ever-changing competitive environment, your data warehouse must provide higher performance, availability, and scalability to support your business's vastly increased tactical and analytical workloads. As a member of the Teradata® family of workload specific platforms the Teradata Active Enterprise Data Warehouse (EDW) 6750 meets the widest range of operational and strategic intelligence needs as the highest performing, most dependable, and most cost effective platform for a Teradata solution.

The Teradata Active EDW platform and Teradata Database together compose a totally integrated solution optimized for the operational and strategic analysis needs of the Teradata Unified Data Architecture™. As a proven framework, the Unified Data Architecture™ is a collection of services, platforms, applications, and tools that makes optimal use of available technologies to enable organizations to gain optimal value from all their data. The Active EDW 6750 is the robust platform for the integrated data warehouse element in the Unified Data Architecture™ that serves to operationalize this data value throughout your organization. The result? You focus on your business and not on managing technology, enabling you to make smarter decisions on any data at any time, faster and with maximum ROI.

To support your data warehousing initiatives, the Teradata Active EDW 6750 platform is purpose built to run the Teradata Database to its fullest capabilities including the industry leading Teradata Virtual Storage and Teradata Active System Management. The massively parallel processing (MPP) architecture of the platform is the perfect match to the parallel, shared nothing architecture of the Teradata Database.

This Teradata Active EDW platform delivers real-time intelligence to place vital data into the hands of front-line decision makers, while extending traditional data warehouse functionality into the realm of tactical decision making. With the Teradata Active EDW, you can combine both these strategic and operational workloads in a single data warehouse. The key attributes of the Teradata Active EDW platform are:

HIGH-PERFORMANCE TECHNOLOGY

With modular design and architecture, the Teradata Active EDW platform is implemented with best in breed system elements that are independently evolved without impact to the rest of the system. An example of this evolution is

Teradata Database's ability to leverage the most current industry-leading Intel® technology to achieve high-performance database computing nodes. The Active EDW 6750 features the 12 Core Intel Xeon® Processor and the platform's parallel architecture fully leverages both the Intel Multi-Core and Hyper-Threading processor technologies to gain maximum processor and system performance.

Another example of a key technology evolution delivered with the Active EDW 6750 is the use of hybrid storage that combines Solid State Drive (SSD) and Hard Disk Drive (HDD) technologies for performance optimization of your data. With Teradata's hybrid storage, the frequently used hot data are stored on very high-performance SSD devices while the less frequently used cold data are placed on the traditional performance HDD devices. Unique to Teradata data warehouses, the placement and migration of data based on data temperature is fully automatic with the Teradata Virtual Storage feature.

In operation, the Teradata parallel architecture uniquely takes full advantage of the speed of SSD storage. In fact, an SSD device is up to 27-times faster than enterprise HDD devices for Teradata workloads. While SSD offers a basic performance enhancement to a Teradata system, SSD's real magic is that it enables the full data warehouse power of a Teradata node to be applied to a far smaller size of data storage than with an HDD-only storage approach. The result is a significant boost in performance per capacity for a Teradata solution.

The bottom line is that higher query throughput along with faster, more consistent query response times provide business value by allowing more real-time users, faster response to events, deeper and more complex analytics, and broader application of your active data warehouse.

SCALABILITY

Unmatched in its scalability, a Teradata system based on the Teradata Active EDW platform accommodates future business growth by expanding incrementally from one to 2,048 nodes. It also accommodates user data space from eight terabytes to 61 petabytes of uncompressed user data. Featuring MPP architecture, the platform supports scalable growth not only in data capacity but in all dimensions including performance, users, and applications.

The Teradata BYNET® system interconnect for high-speed, fault tolerant messaging between nodes is a key ingredient to achieving scalability. The BYNET is based on a robust, powerful protocol with innovative database messaging features that optimize the use of a dual InfiniBand fabric for the Teradata MPP architecture.
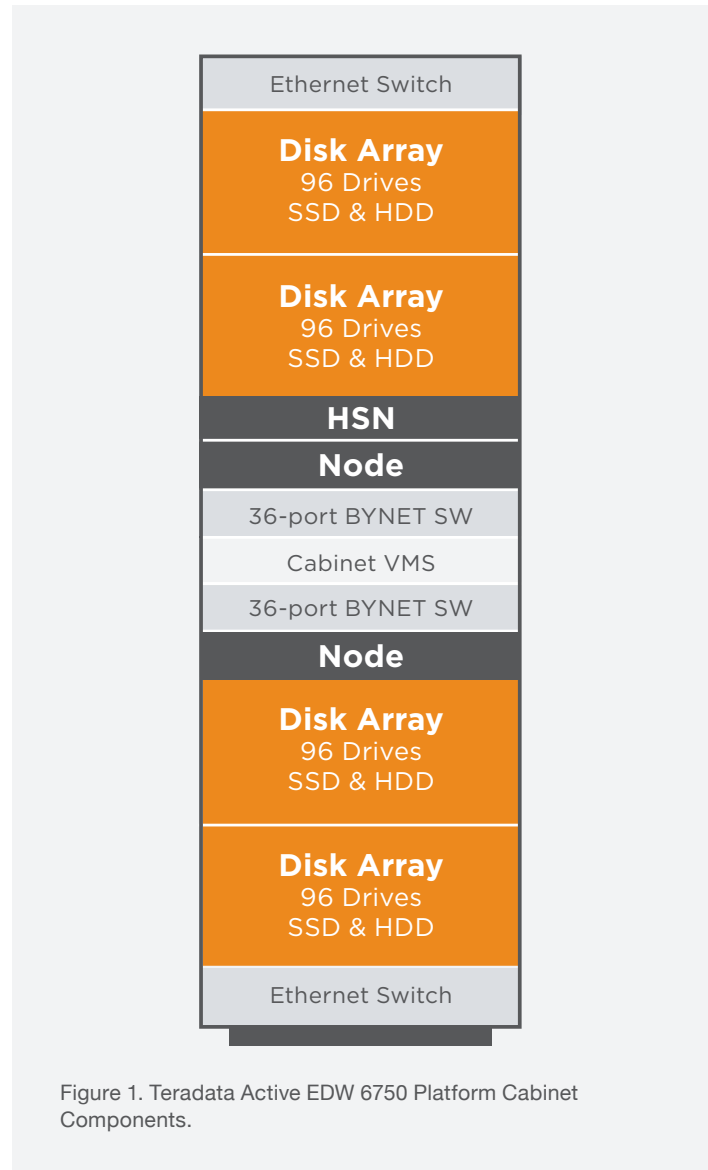
Ethernet Switch
Disk Array 96 Drives SSD & HDD
Disk Array 96 Drives SSD & HDD
HSN
Node
36-port BYNET SW
Cabinet VMS
36-port BYNET SW
Node
Disk Array 96 Drives SSD & HDD
Disk Array 96 Drives SSD & HDD
Ethernet Switch

Figure 1. Teradata Active EDW 6750 Platform Cabinet Components.

AVAILABILITY

The Teradata Active EDW platform achieves availability through Teradata's unique clique architecture in which one or more nodes and a hot standby node are connected to common storage. This clique approach allows Teradata Database to seamlessly failover workloads between the active and hot standby nodes in a clique if a node does fail. Minimizing the impact of component or module failures, the platform also contains redundant hardware components, so if a failure does occur, it won't affect Teradata Database operation or the end-user

experience. Many of the hardware components are hot-swappable, allowing service repair without affecting system availability.

MANAGEABILITY AND EASE OF USE

The platform features simplified platform administration, control, and monitoring with the single operational view provided by the Teradata Server Management Web Services.

The industry-leading, integrated systems management infrastructure monitors and controls the system, performs routine events, such as orderly start up and shut down, and prevents harm from a disruptive failure, such as a power outage or extreme heat. Combined with Teradata Viewpoint, which provides an intuitive and easy-to-use interface for managing and monitoring one or more Teradata systems, the platform enables users to have continuous access to the status of their business results.

GROWTH WITH INVESTMENT PROTECTION

The Teradata Active EDW platform and the Teradata Database have the capability called coexistence that supports multiple platform generations within a single system while gaining full performance from each generation. By enabling expansion through coexistence, you can grow your system to include the latest platform technology, while reaping a return on your initial technology investment and leveraging the price/performance curve as it evolves.

The Active EDW 6750 coexists with the previous generations of hybrid storage platform along with support for coexistence with future generations of the Active EDW platforms.

FLEXIBLE PLATFORM OPTIONS

The Teradata Active EDW supports a variety of processing and storage elements integrated into the system cabinets for the flexibility to meet customer needs. These include:

Teradata node – The basic processing element for the Teradata Database.

Hot standby node – A redundant Teradata node added to a clique to provide full performance continuity during node failure.

Data storage arrays – Multiple storage arrays that provide both the RAID controllers and data storage drives. The storage drives can be either SSD or HDD drive types.

Teradata BYNET InfiniBand Switches – Supports the high-performance BYNET system interconnect with high availability, fault tolerant, dual networks that ensure highly scalable, error-free MPP communication. These switches, housed in the system cabinet, are sized for systems up to 18 nodes. For larger sized systems, a separate BYNET switch cabinet is used to scale out the BYNET-based InfiniBand fabric to the required number of nodes.

Channel node – A dedicated Teradata node that supports Teradata Database's unique capability for mainframe connectivity. Also, the Extended Channel Server enables connection to a remotely located mainframe.

Teradata Managed Server – Applies enterprise-level Teradata system management capabilities to a commodity server for applications that support Teradata Database. A base model of the server can be configured to meet your needs and supports the Linux® operating system. Pre-configured models are available for specific Teradata tools and applications, such as Teradata Unity, Data Mover, Multi-System Manager and data loading. Multiple Teradata Managed Servers can be supported in the cabinet and in a separate Platform Framework Cabinet.

Virtual Management Server (VMS) – Based on the Teradata Managed Servers and virtualization technology, this server virtualizes multiple key system functions into a single physical server. These functions include the Teradata Viewpoint Appliance, the cabinet management functions, and the Teradata Customer Services Workstation for remote access to the system. The VMS saves valuable cabinet rack space by eliminating the need for separate physical servers for each of these functions.

Platform Framework Cabinet (PFC) – Provides a flexible approach to the packaging and management of all the platform elements described above that are not Teradata node or storage related. In addition to these elements, such as Teradata Managed Server and BYNET Switches, the Backup Archive Restore (BAR) backup devices for smaller sized systems are supported as space permits.

PLATFORM SUSTAINABILITY

The Teradata Active EDW platform's performance and scalability enable you to save significant energy and floor space while achieving the same data warehouse work as done by previous systems. The enhanced processing power of the nodes in the Active EDW 6750 and increased cabinet node count combine to provide up to twice the performance capability in a single cabinet

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THE TERADATA ACTIVE EDW PLATFORM

The Teradata Active EDW 6750 is available in one basic model. To meet your needs, choose the amount of frequently used hot data needed for each node, as determined by the amount of SSD storage, and the amount of less frequently used warm/cold data as determined by the number and capacity of HDD storage.

FEATURES AND CAPABILITIES	6750H
Storage Architecture	Hybrid Storage
Intel Xeon Processors	12-Core 2.7GHz
Memory/Node	512GB
TPerf/Node (Teradata's performance measure)	240
Cliques (redundancy group)/cabinet	One
Max active nodes/cabinet (and clique)	3
Coexistence	Three generations
Teradata BYNET V5	BYNET Software On InfiniBand
SSD	2.5" 400GB
HDD	2.5" 10K RPM: 300-, 450-, 600GB
User Data Space per Node (no compression)	8 – 30TB
Teradata Database Version	13.10 and higher

Figure 2. Teradata Active EDW 6750 features and capabilities.

compared to previous generations of Active EDW. This dramatically reduces the floor space and energy for the same performance and data space. Also, this Teradata platform's unique coexistence capability lengthens the useful life of Teradata systems resulting in less carbon and electronic waste.

PURPOSE-BUILT PLATFORM EXCELLENCE

The Teradata Active EDW platform can adapt and grow along with your business. Backed by award-winning professional services, support, and Teradata Corporation's demonstrated data warehousing expertise, the Teradata Active EDW is the solid foundation you need to drive real value from your data to maximize the return on your investment.

Each platform is integrated according to the configuration that best meets your needs and is pre-tested, so it's ready to run right after delivery. You can begin loading data and running queries shortly after initial delivery— and quickly begin getting business value.

The Teradata platform provides unmatched performance for all your strategic and operational analytics needs, eliminates risk, and allows you to focus on driving the highest return on your data warehousing investments— today and in the future.

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TERADATA ACTIVE ENTERPRISE DATA WAREHOUSE 6750 DESCRIPTION

TERADATA NODES

Processors

- Intel Xeon Processors E5-2697 V2 Series, 12 Cores
- Clock speed: 2.7GHz with maximum Turbo Boost to 3.5GHz
- Up to 30MB Level 2 Cache per processor
- Intel Hyper-Threading Technology with 2 threads per Core
- Intel Quick Path Interconnect at up to 8 Giga-transactions per second for I/O

Memory

- Up to 512GB (standard) using DDR3 fully-buffered DIMMS with ECC
- Memory controller built into each Xeon processor

Node Internal Storage Devices

- Integrated RAID controller with SAS backplane
- Eight media bays per node
  – Up to four hot-swappable SAS hard drives (plus three 900GB drives as standard for operating system and dump)
  – One CD/DVD-ROM drive

Connectivity per Node

- Seven PCI slots
  – Four full-height PCIe Gen 3
  – Three half-height PCIe Gen 3
- Storage Connectivity
  – 6Gb Quad and Dual SAS Adapters
- Customer Ethernet Network Connectivity
  – Four on-board 1Gb Ethernet connections (two for Server Management)

  – 1Gb Copper – Quad Port Adapter
  – 1Gb Fiber (Optical) – Dual Port Adapter
  – 10Gb Copper and Fiber – Dual Port Adapters

Operating System

- SUSE® Linux, SLES 10 & SLES 11*

Teradata BYNET V5 MPP Interconnect

- Enables linear scalability up to 2048 nodes maximum
- Fault tolerant interconnect via dual networks
- QDR InfiniBand interconnect for physical layer
  – Up to 10GB per second per node bandwidth on dual redundant networks
- Up to 100M link cable length for data center flexibility (other lengths available)
- InfiniBand adapters on PCIe Gen 3 for optimal interconnect performance
- BYNET V5 Switch Cabinets support system sizes over 18 nodes with cascadable InfiniBand switches of 108 and 324 ports in separate cabinet models

Data Storage

- Storage Devices
  – 400GB SSD, SAS Enterprise Flash drives
  – 300GB, 450GB and 600GB HDD, SAS interface, 10K RPM, enterprise-class drives
  – SSD provides ECC data protection and supports robust, five year write wear out protection

  – Full disk encryption on HDD drives for secure data if drive lost or stolen
- NetApp E5500 Arrays
  – Up to 96 drives (SSD and HDD) per array
  – Up to four arrays per cabinet
  – High availability with dual redundant RAID 1 controllers
  – Full data integrity protection with T10DIF end-to-end data integrity

Teradata Database

- Integrated and certified with Teradata Database
  - Release V13.10*, V14.0, V14.10, and future releases
- 6750H requires Teradata Virtual Storage feature to provide automatic temperature-based data migration and management in hybrid storage (SSD and HDD)

System Cabinet

- High-density cabinet enables complete Teradata clique (nodes and storage) in one cabinet
- One to three Teradata nodes plus Hot Standby node
- Five storage arrays per cabinet each with SSD and/or HDD devices
- Dual, 36-port BYNET V5 switches support up to 18-node system size
- Cabinet management server and Ethernet network switches
- Dual AC distribution with raised floor or overhead AC cable egress

*Note, available after mid 2014

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Platform Framework Cabinet

- Teradata Managed Servers for related applications such as Load, Unity, Data Mover, and SAS
- Virtual Managed Server combines Teradata Viewpoint, cabinet management, and services workstation functions
- Teradata Channel Nodes for Mainframe Connectivity: FICON and ESCON
- Teradata Backup Archive Restore (BAR)
  - Tape and disk storage products (see External BAR below)

High Availability Hardware Features

- Multiple AC inputs enable power sourcing from two grids for maximum uptime.
- Hot pluggable/replaceable components include power supplies, disks, and cabinet fans.
- Fault resilient fan modules, redundant power supplies, fault tolerant BYNET Interconnect.

External Backup Archive Recovery (BAR)

- Teradata integrated products and solutions
  - Quantum Tape libraries
  - EMC Data Domain Disk Backup
  - Storage management with Symantec NetBackup (BakBone NetVault or IBM Tivoli are alternatives)

OPERATING SPECIFICATIONS

- Height: 80.5 in. (204.5 cm)
- Width: 24 in. (61.4 cm)
- Depth: 47 in. (119.4 cm); 49 in. (124.4 cm) with doors
- Weight: 1,734 lbs. (786 kg) fully loaded
- Operating Temperature: 59°F to 89.6°F (15°C to 32°C)
- Voltage Range: North American: 200-240VAC, International: 220-240/380-415VAC
- Frequency: 50/60Hz
- Current: North American: 30A 4-cord or 60A 2-cord, International: 32A 2-cord
- Power: 7,100 Watts Max
- Dual AC: Standard; overhead power routing supported
- Compliant with U.S. and International Safety and Emissions Standards
- RoHS compliant; WEEE Services available

SUPPORT SERVICES

Global

- Regional service centers and in-country local language support
- 24/7 support
- Experienced data warehousing service associates

Warranty Support

- One-year remote and on-site hardware support, operating system problem resolution
- 24-hour incident reporting

Availability Management Services

- Proactive, holistic approach for protecting a system from risk events that can reduce or degrade availability.

Premier Warehouse Support

- Delivers a single source service to maximize value and availability of your solution.
- Flexible support options that allow you to select the coverage and response times you need.
- Integrated, proactive tools, such as Teradata Vital Infrastructure and Teradata ServiceConnect™ remote connectivity.

Teradata Vital Infrastructure

- Built-in support software available on each Teradata Active EDW platform.
- Regularly collects system asset data.
- Fault event data are recorded; automatic incident reports are created.
- Alert notifications are sent and tracked (Call Home capability).

Implementation Services

- Staging
- Installation
- Software Implementation

Operational Services

- Critical System Management
- Data Migration
- Operational Mentoring

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