

TERADATA ACTIVE ENTERPRISE DATA WAREHOUSE 6700

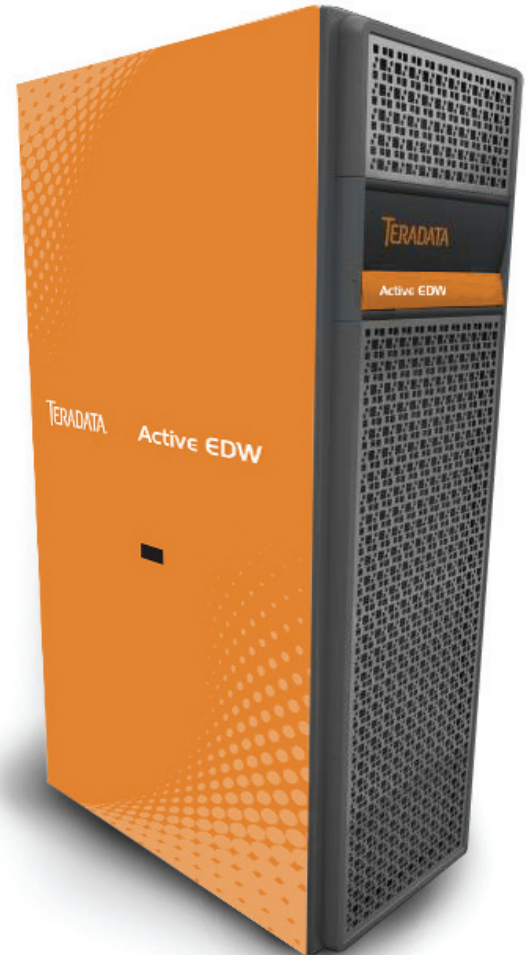
ACTIVE DATA WAREHOUSING PLATFORM FOR TERADATA SOLUTIONS

In today's fast-paced, ever-changing competitive environment, your data warehouse must provide higher performance, availability, and scalability to support your business's increased real-time and decision-support workloads. Teradata offers a broad family of platforms that spans a company's business and analytical data warehouse needs. The Teradata® Active Enterprise Data Warehouse (EDW) 6700 meets the widest range of operational and strategic intelligence needs as the highest performing, most dependable, massively parallel processing (MPP) platform ever released for a Teradata solution.

Teradata Active EDW platform and Teradata Database are a totally integrated solution optimized for the operational and strategic analysis needs of the integrated data warehouse in the Unified Data Architecture™. The result? You can 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 all your data warehousing initiatives, the Teradata Active EDW 6700 platform is purpose built to run the Teradata Database to its fullest capabilities including Teradata Virtual Storage and Teradata Active System Management. The 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 by operationalizing the Active Data Warehousing™ solution in your enterprise. This key capability places 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, discrete 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 6700 features the Eight 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 6700 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.

The basic Teradata parallel architecture uniquely takes full advantage of the speed of SSD storage. In fact, an SSD device is 16 to 22 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 the 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 2,000 nodes. It also accommodates user data space from seven terabytes to 60 petabytes of uncompressed user data. Featuring MPP architecture, the platform supports scalable growth in all dimensions.

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 powerful protocol with built-in database messaging features that optimize the use of a dual InfiniBand fabric for the Teradata MPP architecture.

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 a clique's active and Hot Standby nodes if a

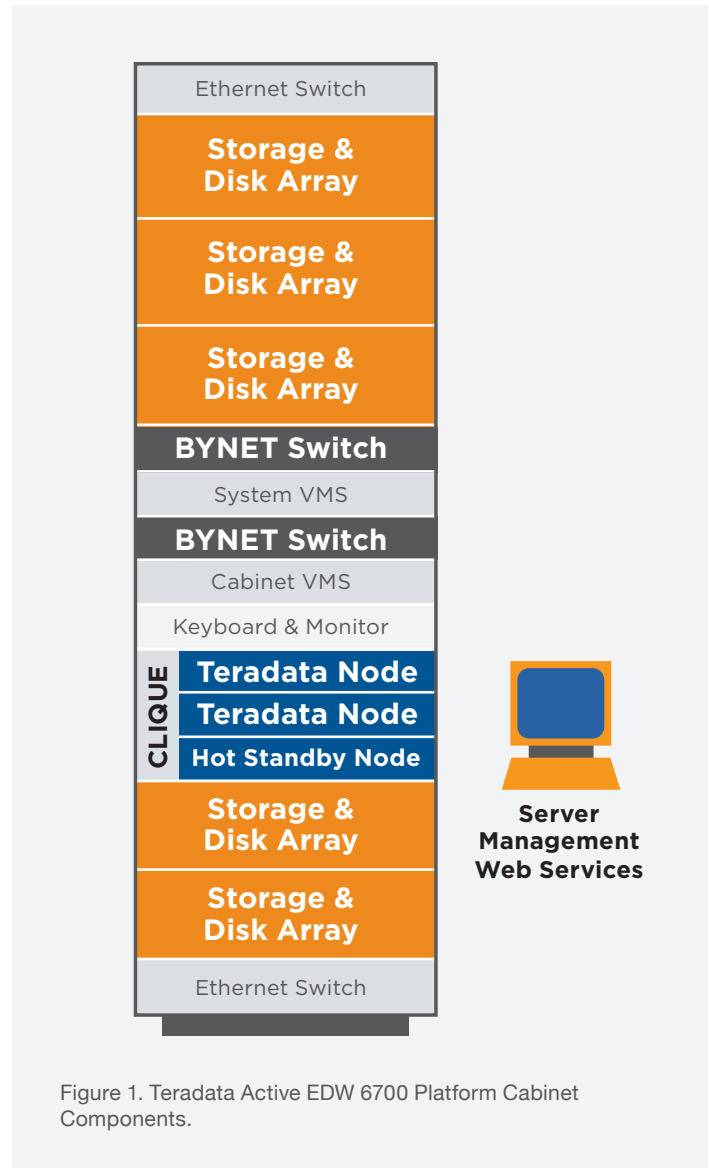


Figure 1. Teradata Active EDW 6700 Platform Cabinet Components.

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 through the single operational view on 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 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 expand 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 6700 coexists with the previous generation of hybrid storage platform and with three previous generations of HDD-based systems, 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® 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 (MS) – 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 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 small form factor storage drives of the Active EDW 6700 saves up to 2/3 of the data center space compared to previous generations of Active EDW dramatically reducing 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.

THE TERADATA ACTIVE EDW PLATFORM

The Teradata Active EDW 6700 is available in two basic models. 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.

TERADATA ACTIVE EDW 6700 AVAILABLE MODELS

| MODEL | 6700C | 6700H |
|---|---------------------------------|----------------------|
| Storage Architecture | HDD-only | Hybrid Storage |
| Intel Xeon Processors | 6-Core 2.0GHz | 8-Core 2.6GHz |
| Memory/Node | 128GB (256GB option) | 256GB (512GB option) |
| TPerf/Node (Teradata's performance measure) | 91 | 167 |
| Cliques (redundancy group)/cabinet | One | |
| Max active nodes/cabinet (and clique) | 2 | 3 |
| Coexistence | Four generations | Two generations |
| Teradata BYNET V5 | On InfiniBand | |
| SSD | Upgradeable | 2.5" 400GB |
| HDD | 2.5" 10K RPM: 300-, 450-, 600GB | |
| User Data Space per Node (no compression) | 12 - 30TB | 7 - 29TB |
| Teradata Database Version | 13.0 and higher | 13.10 and higher |

Figure 2.

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 protect your data and your investment.

Each platform is integrated according to your configuration and 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.

TERADATA ACTIVE ENTERPRISE DATA WAREHOUSE 6700 DESCRIPTION

TERADATA NODES

Processors

- Intel Xeon Processors E5-2600 Series Eight or Six Cores
- Up to 20MB 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 256GB using DDR3 fully-buffered 16GB DIMMS with ECC
- Optional expansion using 32GB DIMMs (256GB in 6700C and 512GB in 6700H)
- Memory controller built into each processor

Node Internal Storage Devices

- Integrated RAID controller with SAS backplane
- Six media bays per node
 - Up to four hot-swappable SAS hard drives (three 900GB drives for operating system and dump standard)
 - 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 1Gbit 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 64-bit

Teradata BYNET V5 MPP Interconnect

- Enables linear scalability up to 2000 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
- 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 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
 - HDD and SSD data availability protection with DAP end-to-end data integrity
 - 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 Arrays
 - Up to 72 drives (SSD and HDD) per array
 - Up to five arrays per cabinet
 - High availability with dual redundant RAID 1 controllers

Teradata Database

- Integrated and certified with Teradata Database
 - Minimum release V13.00 for 6700C and V13.10 for 6700H
- 6700H 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

Platform Framework Cabinet

- Teradata Managed Servers for related applications such as Load, Unity, Data Mover, and SAS

Continued

- 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
 - Oracle 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
- 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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DECISION
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