Tech Company

Zen4 System Hardware Guide

Tech Company Systems, Inc. Legal Notice

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Product Support

This appendix provides information about product warranties, customer service, returning components, and ordering replacement or spare components.

Note: For additional product support information that is not covered in this appendix, visit the Tech Company Customer Support web site or call one of the customer service phone numbers listed in .

(continued from Product Support)

Warranty

Zen4 systems are covered by a comprehensive warranty to assist you in troubleshooting and issuing replacements and returns.

[Writer will need to write a description of general information about the standard warranty.] For detailed information about the standard warranty, contact the Tech Company Sales or Customer Support Team.

(continued from Warranty)

Verifying Warranty Status

Contact Tech Company to confirm your warranty is up-to-date.

Procedure

- Locate the serial number from the label on the back of Zen4chassis.
- Contact contact Tech Company Customer Support **or** your Tech Company account representative to verify warranty status.

Result: You will know if your products apply for customer support, returns, and/or replacements.

(continued from Warranty)

Service Features and Levels

Tech Company Customer Support provides 24/7 service with tiered response levels, delivered directly with online call logging and status tracking available.

Author will need to write a 1-2 sentence description of the concept, not to exceed 50 words.

Customer Service Features

The goal of the Tech Company Customer Support organization is to consistently deliver the quality of service you require in a mission-critical, data center environment. Tech Company is committed to providing around-the-clock customer service, either directly or through our service partners who have been factory-trained and certified by Tech Company Systems. You can log calls at any time by telephone or email, or through a web interface to our support system. All calls are actively managed to conclusion by a Tech Company Support Engineer. (A service partner may provide the on-site repair services.) Status tracking is available via the web interface to our support system.

Tech Company provides multiple scalable service levels to suit individual customer needs. Some of the service levels include access to an assigned Tech CompanyCustomer Support account engineer. This engineer can help you with installation and upgrade planning and provide progress reviews. An assigned account engineer is the primary point of contact for handling service calls.

Tiered Response Levels

Customers with the appropriate service contract may designate one of the following priority levels for service calls:

- Priority 1. Highest severity: Work starts immediately to resolve the problem.
- Priority 2. Medium severity: Work starts within 1 hour to resolve the problem.
- Priority 3. Lowest severity: Work starts within 4 hours to resolve the problem.

(continued from Service Features and Levels)

Contacting Customer Support

Contact Customer Support to troubleshoot hardware queries or initiate an Return Materials Authorization (RMA).

Call or email Customer Support to initiate a query

- 24-hour hotline: 1-800-968-6501
- Email: support@Tech Company.com

Result: Initiate, troubleshoot, or resolve a query.

For additional information about customer service, visit the Tech Company website at: Insert website name here.

(continued from Contacting Customer Support)

Return Materials Authorization (RMA) Procedure

Zen4 offers a parts replacement service, the Return Materials Authorization (RMA) Procedure, for customers who wish to maintain their systems beyond or outside the warranty period.

RMA Description

Tech Company systems are covered by a 1-year comprehensive on-site warranty covering parts and labor. Following the warranty period, systems will normally be maintained by Tech Company under the terms of a service agreement covering parts and labor. For customers who wish to maintain their own systems and obtain replacement parts from Tech Company, we offer a parts replacement service which includes this RMA procedure.

Tech Company will, at its option, repair or replace any product or component that fails during the term of the parts replacement service agreement at no cost to you, provided that you contact the Tech Company Support Center to report the failure and that you comply with the Tech Company return policies.

RMA Conditions

A replacement product or component will be shipped to you on the first contracted day following confirmation of the failure. When you receive the replacement, you must return the failed product or component to Tech Company under the RMA number issued by Tech Company. Tech Company may invoice you for any failed products or components under the following two conditions:

- You have caused further damage to the product or component.
- The product or component is not returned within 10 days of receipt of the replacement.

Products returned to Tech Company must be pre-authorized by Tech Company with an RMA number marked on the outside of the package, and sent prepaid, insured, and packaged appropriately for safe shipment using the packaging that the replacement was sent in. Only packages with RMA numbers written on the outside of the shipping carton and/or the packing slips and shipping paperwork will be accepted by the Tech Company receiving department. All other packages will be rejected.

(continued from Return Materials Authorization (RMA) Procedure)

Following the RMA Procedure

Complete the RMA Procedure to return a component and receive a replacement.

Procedure Overview

Products returned to Tech Company must be pre-authorized by Tech Company with an RMA number marked on the outside of the package, and sent prepaid, insured, and packaged appropriately for safe shipment using the packaging that the replacement was

sent in. Only packages with RMA numbers written on the outside of the shipping carton and/or the packing slips and shipping paperwork will be accepted by the Tech Company receiving department. All other packages will be rejected.

Title to any returned products or components will transfer to Tech Company upon receipt. Tech Company will be responsible for all freight charges for returned products or components as long as you use the carrier designated by Tech Company.

Before you begin

Call the Tech Company Customer Support Center Hotline to request a replacement component. Be prepared to provide the following information:

- Chassis serial number
- Serial number of item to be returned
- Model number of item to be returned
- Description of problem
- Return address and phone number

Result: Tech Company will issue an RMA number and ship a replacement component.

Return the defective item for a replacement

1. **Unpack and install the replacement product to empty the packaging materials.**
2. **Use the same packaging materials to pack the defective item for return.**
3. **Display the RMA number clearly on the packaging exterior to ensure Tech Company accepts the package.**
4. **Return the defective product back to Tech Company via a designated shipping carrier.**

Result: User will have successfully returned the defective product to the Tech Company according to the terms of the service agreement.

(continued from Return Materials Authorization (RMA) Procedure)

Ordering Replacement or Spare Parts

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There are two ways to order replacement or spare parts:

- Visit the Tech Company Customer Support website: Insert website name here
- Contact your Tech Company account representative

Result: You will be issued a replace or spare part.

(continued from Introduction to the Tech Company Servers)

System and Architectural Overview

The Tech Company Zen4 enterprise server combines partitionable symmetric multiprocessing (SMP) using 64-bit AMD Opteron® processors with multi-Gigabit Ethernet networking, Fibre Channel storage I/O, and offloaded application services. The network and storage I/O can be dynamically allocated across a built-in 80-Gbps switch fabric. Multiple Zen4 system chassis can be directly coupled and managed as a single pool of resources. The result is a mainframe-class architecture that offers high throughput and stability for enterprise applications.

[Author to add 2-3 sentence description that illustrates topic purpose]

The Zen4 system consists of a chassis with the following installed resources ():

- **Processor and Memory Modules (PMMs)** that support general-purpose computing requirements. Two types of PMMs are available: PMM-0410s and PMM-0200s.

  PMM-0410s provide processor sockets for up to four AMD Opteron 64-bit x86 CPUs with memory. The PMM-0410 also offers a total of 8 Gbps of storage I/O bandwidth using Fibre Channel interfaces.

  PMM-0200s provide CPU sockets for a maximum of two AMD Opteron 64-bit x86 CPUs with memory. Applications can be installed on a PMM-0200 to provide low-latency access by the PMM-0410. Such a configuration can improve performance for certain applications on the PMM-0410 that depend on other applications that can be accessed with low latency.
- **Q-Series System Modules (ZSMs)** that implement provisioning, system management, and fabric management capabilities.
- **Ethernet Network Modules (ENMs)**, each providing 10 Gbps of network I/O bandwidth, using either copper or fiber optic interfaces.
- **Fibre Channel Modules (FCMs)** that interface to storage arrays and storage devices, either directly or indirectly through storage area networks (SANs).
- **Application Service Modules (ASMs)** that provide acceleration facilities for specialized functions such as load balancing, SSL encryption, and XML processing. The initial ASM implementation is the ASM-0201, which hosts SSL acceleration and server load balancing (SLB) services either in standalone or "cluster" mode.

Major Zen4 components are designed for front-accessible servicing. Power modules are located on the back of the chassis (). Fan trays above and below the resource modules provide system cooling.

Figure 1-1 Zen4 Chassis—Front View

Figure 1-2 Zen4 Chassis—Rear View

(continued from Introduction to the Tech Company Servers)

System and Architectural Overview

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Figure 1-2 Zen4 Chassis—Rear View

(continued from System and Architectural Overview)

Technical Overview

The Zen4 system is a collection of resources arranged around a coherency fabric and a network or I/O fabric. Three broad types of resources are attached to the fabrics and linked through an internal switch: processing and memory, I/O modules (Ethernet and Fibre Channel), and off-load or acceleration services. The ZSM monitors and manages these resources. The processors and associated memory are organized as standard SMP servers, allowing flexible combining and partitioning to meet application needs. The Ethernet and Fibre Channel interfaces provide connections to the external network and to storage resources. The Zen4 system includes built-in layer 2 network switching capabilities.

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There are multiple operating environments within a Zen4 system, including user operating environments for customer application deployment and internal operating environments for the Zen4 system software. The user operating system (for example, SUSE™ Linux Enterprise Server 9) runs in a partition to create a server that runs user applications.

Reliability, availability, and serviceability (RAS) are three qualities that represent the collective quality-of-service attributes of network systems. The Zen4 system has a combination of features, hardware design, and software design that maximizes uptime and minimizes downtime. Hardware design features that contribute to high levels of RAS include front access to most components for servicing, redundant cooling and power systems, and redundancy of system control modules and network interfaces. A graphical user interface and command line user interface are available for management of the system resources; in addition, an SNMP agent allows the Zen4 chassis to be integrated into enterprise monitoring systems such as HP OpenView® or IBM Tivoli® for diagnostics, monitoring, and troubleshooting. The partition boot architecture of the Zen4 system helps minimize downtime arising from disruptive operating system updates.

Server administration and network administration are combined in the Zen4 system; the flexible security model provided by the Zen4 platform allows these functions to be separated in settings where this is preferred. The Zen4 platform provides fine-grained security and role-based access control that defines specific access privileges for different user roles. In addition to the default user roles, you can define other specific roles and access privileges. Within each user role, you can also specify query-only access and query-plus-set access for individual management and administration operations.

Processors, Memory, and Partitioning

Application processors are deployed on modules called Processor and Memory Modules (PMMs). PMMs support general-purpose computing requirements and are available in two series: PMM-0410s and PMM-0200s.

- PMM-0410s provide processor sockets for up to four AMD Opteron 64-bit x86 CPUs with memory. The PMM-0410 also offers a total of 8 Gbps of storage I/O bandwidth using Fibre Channel interfaces.
- PMM-0200s provide CPU sockets for a maximum of two AMD Opteron 64-bit x86 CPUs with memory. Applications can be installed on a PMM-0200 to provide low-latency access by the PMM-0410. Such a configuration can improve performance for certain applications on the PMM-0410 that depend on other applications that can be accessed with low latency.

The application processors and memory are the only resources that attach to the coherency fabric. The processors and memory on a PMM can be organized into standard SMP servers; in a chassis equipped with PMM-0410s, multiple PMM-0410s can be linked through the coherency fabric (backplane) to create instances of SMP servers containing up to eight processor sockets. Smaller partitions of two or four processors can also be configured.

A chassis equipped with two PMM-0410s can support eight system processors (8 cores with single-core processors or 16 cores with dual-core processors), 128 GB of system memory, 30 Gbps allocated between network traffic and storage traffic, and three Application Service Modules (ASMs).

The PMM-0410s and coherency fabric support physical partitioning of the processors and memory. Because each partition is an independent server, multiple independent instances of operating systems can be hosted concurrently.A partition can be created, initialized, started, stopped, reset, or destroyed without affecting the operation of other partitions. Each partition appears as a separate entity for system management.

Physical partitioning is implemented in the hardware and in system software. The hardware ensures that hardware and software faults in one hardware partition cannot propagate to another partition.

For more information about the PMMs, refer to

System Management

System management is implemented through a combination of management software components and a distributed hardware management subsystem. Through the hardware management subsystem, system components communicate with the ZSM, which manages chassis resources. The hardware management subsystem also allows remote, “lights-out” operation of the Zen4 system. This management capability extends to a system in the standby power state, when it has limited operational capabilities as it waits for instructions. All system messages are directed to the ZSM console and system log (syslog) facility. For more information about the ZSM, refer to

Access to the Zen4 system for management and software installation is through network or serial connections, eliminating the need for keyboard, video, and monitor connectors

on the system itself. All necessary software installation can be accomplished through a network connection.

The Zen4 chassis has a front panel display with associated selection buttons. Using the front panel display, you can view system status information and shut down or restart the chassis. A command line interface (CLI), accessible through a direct console port connection or a network connection, provides complete management functions for the system. The Tech Company Q-Visor™ software provides the same management capabilities as the CLI, through a user-friendly graphical interface. Q-Visor software also provides visual alarms and alerts.

For more information about configuring and managing the Zen4 system, refer to the *Zen4 Software Configuration Guide*.

Storage I/O

The Zen4 system has slots for two installed Fibre Channel Modules (FCMs). One FCM provides access to an aggregate of 16-Gbps Fibre Channel I/O bandwidth through 2-Gbps Fibre Channel interfaces. A system with two installed FCMs, therefore, provides a total of 32 Gbps of Fibre Channel I/O.

In addition, each PMM-0410 has dedicated Fibre Channel ports that are associated only with the server partitions on that PMM.

Internal Storage

The Zen4 system does not include an internal hard drive for the user operating system (UOS). The Zen4 system provisioning facility allows users to create flexible server configurations that can be revised and reconfigured quickly based on a number of considerations. This flexibility is lost if the user operating system resides on an internal hard drive. An optional direct-attached external hard drive subsystem is available for supporting traditional boot configurations.

Long-term storage for the management software is provided by an on-board flash disk and a 2.5-inch hard disk on the ZSM. The flash disk is used for storing system management software, configuration data, and application software. The 2.5-inch hard disk is used for event logging.

System Battery/System Time

To increase system reliability, the ZSM uses a capacitor, rather than a battery, to maintain the system time when the chassis is not plugged into a power source. The system time can be maintained for approximately 48 hours while the chassis is unplugged.

(continued from Software Components)

Typical System Installation

shows a typical installation of the Zen4 system with four server partitions. Each partition has two Fibre Channel I/O connections to a storage area network (SAN) and two virtualized Ethernet connections to the external network. The ZSM has an Ethernet connection and a serial connection to a management network.

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[Author to add Concept elements]

Figure 1-1. Logical View of Typical Installation

(continued from Software Components)

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