DeltaV™ Zones

- An architecture designed to effectively operate and manage large systems
- Enhanced flexibility to operate geographically dispersed systems
- Integrated operation and alarming for multiple DeltaV™ systems
- Enhanced systems maintainability – for both commissioning and maintenance related activities

Multiple standalone DeltaV systems can now be connected via an Inter-Zone Network to provide unprecedented view and control of your entire plant.

Introduction

The DeltaV™ Zones hierarchical system architecture helps provide flexible system operation and expansions with enhanced system performance.

Each zone represents a DeltaV system (defined by a ProfessionalPLUS Station), with up to 30,000 I/O each. Up to 15 zones can be integrated to provide the ability to share selected information across zones. Large processes requiring more nodes than a single DeltaV system supports can be split into separate zones, thus providing added flexibility to expand and upgrade each zone independently.

Multiple zones are integrated into a unified architecture that is logically transparent throughout all domains. Any operator workstation within the unified architecture can provide view and control for the areas assigned to that workstation, regardless of domain. Data exchange between domains is seamless via the fully redundant DeltaV Inter-Zone Network.

Benefits

An architecture designed to effectively operate and manage large systems. The DeltaV Zones supported features are intended to make the DeltaV system a better fit for certain control system architectures and to give DeltaV users more flexibility to operate and maintain their systems. This enhanced flexibility includes the ability to integrate multiple DeltaV systems that were formerly separate, or segregate formerly single DeltaV systems into multiple integrated domains. DeltaV Zones provides an operational infrastructure that can be used to easily manage large-scale facilities of up to 15 independent DeltaV systems.

Enhanced flexibility to operate geographically dispersed systems. Zones allow users to interconnect DeltaV systems that are designed to be separate. Examples include:

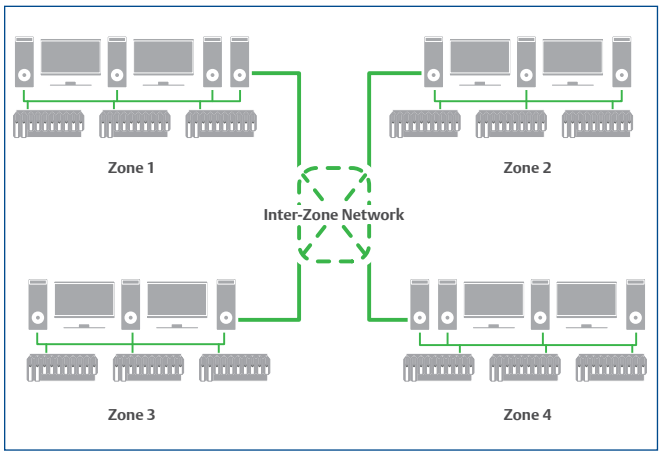
- Controller nodes cannot all be on the same DeltaV control network due to distance, communication link, or node limit restrictions.

- The user desires to administer/configure the DeltaV systems separately, perhaps to ensure adequate redundancy.
- Plant expansion can be performed without impacting existing operations.

Integrated Operation and Alarming for multiple DeltaV systems. Users can interconnect DeltaV systems so that operational functions may be performed on the combined DeltaV systems from a single workstation at the same time, without requiring that the DeltaV systems undergo disruptive (or costly to engineer) configuration changes. Examples include:

- Display and change parameters from different zones in the same DeltaV Operate application; including display of parameters from different zones in the same display.
- With virtually no re-engineering effort, use the displays originally engineered for a different zone and reference the intended parameters in its respective zone.
- Integrate alarm information from multiple zones in a single DeltaV alarm banner and combined summary displays.
- View continuous historian data in other zones.
- View event data gathered from plant areas in multiple zones.

Enhanced systems maintainability – for both commissioning and maintenance related activities. Each system in a DeltaV Zones system functions as a complete system independently of the other zones. This allows maintenance or commissioning activities in each system to be performed without impacting the other systems. Zones also allows each system to operate at a different DeltaV revision, and still share data across zones. This allows users to better manage their system upgrades.



The Inter-Zone Network is shown in bold green to demonstrate how multiple standalone systems can be connected via Inter-Zone Servers in each zone.

Engineering

The capability now exists to remotely engineer another zone system. In addition to the added convenience, this flexibility provides an added level of system redundancy. The procedure is as follows:

- The user accesses a DeltaV Remote Client session (terminal server session) configured and licensed for engineering access (i.e. DeltaV Professional Station).
- From this session the complete functionality of a DeltaV engineering station is available to the user.
- In this session, only the connected zone is available for engineering, including any external references it may have to other zones in the control strategy.

Control

Interconnect separate DeltaV systems so that control strategies may exchange data. Expected uses include:

- Feedforward/feedback information between DeltaV systems. Examples include the information exchange between upstream and downstream units or critical utilities information.
- Share Foundation fieldbus device status information from DeltaV systems in other zones.

This new flexibility can provide better plant-wide control by providing the ability to access key information that was previously unavailable or too costly/difficult to implement.

Large or geographically dispersed systems can benefit from the DeltaV Zones Architecture.

Networking

The network between the zones is named the Inter-Zone Network. The Inter-Zone Network is a high-speed 1 Gigabit Ethernet network and is fully redundant, with redundant connections and redundant network equipment.

Hardware

The hardware used for the Inter-Zone Servers consists of high performance servers. These servers are the same as for the DeltaV Application Station, thus reducing spares inventory.

Redundant Inter-Zone Server capability is available to ensure maximum reliability of Inter-Zone communications.

Performance

The two main types of critical data communicated through the zone network are operator data and control data. Two criteria determine the performance of the Process Zones architecture: throughput quantity and communication time.

The throughput quantity of a single zone server is not limited by the device, but by the size of the system, i.e. all data from the largest possible single zone system can be transmitted to the Inter-Zone Network. The zone servers have been tested to 20,000 parameters per second in each direction.

On average, the communication time between two zones adds one second to the time required for an interlock signal to be communicated between two controller nodes that sit on the same network. An interlock condition detected in a module located in one zone should be available to a subscribing module in another zone within 2 seconds.

A redundant Inter-Zone Server can be used to further increase the availability of the Inter-Zone architecture. Following a communication failure, communication between zones is restored automatically.

Plant Wide Network Integration

In addition to the Inter-Zone network, users may want to integrate zone data into plant wide applications, such as:

- AMS Suite: Asset Portal
- Alarm System Management
- Plant Wide Event Historian
- 3rd party enterprise historian

The Inter-Zone network is expected to be a dedicated redundant Ethernet network intended for use with DeltaV communication protocols. The Plant Wide Network is viewed as an open network intended for sharing of plant data with information systems and other data consumers.

Each DeltaV system may also make use of the AMS Suite: Intelligent Device Manager server to manage Foundation Fieldbus and HART devices connected to that system. This information can in turn be collected by the AMS Suite: Asset Portal that provides access to the device diagnostic information across the enterprise.

Alarm System Management with DeltaV Analyze can be located on a dedicated server on the Plant Wide Network. This provides easy and ready access to alarm analysis tools to everyone who needs it.

The Plantwide Event Historian (PEH) can be used to consolidate alarms and events from all Zones into a single alarm and event database. This database can also be used by the DeltaV Analyze application.

A 3rd party enterprise historian can be used to consolidate DeltaV real-time and/or historical data from each DeltaV zone system along with real-time and historical data from other 3rd party devices and systems.

If needed, users can assign enabled Plant Areas from one zone to the DeltaV Continuous Historian or Event Chronicle in another zone. Doing so makes the data available to that zone's Process History View client.

Ordering Information

Description	Model Number
Zone Operations Workstation license (per zone), where xxx represents the number of workstations having zone operations capabilities (xxx = 000 – 080)	VE2111Exxx
Optional Redundant Zone Server capability (per zone)	Optional Redundant Zone Server capability (per zone) VE2111RED

Related Products

- **Plantwide Event Historian.** Captures all alarms and events for your entire plant and integrates them into one database for easy viewing, retrieval, and analysis.
- **DeltaV Analyze.** Provides Web based analysis of alarms and events in either the Event Chronicle or Plant Event Historian.
- **Enterprise Historian.** OSIsoft PI Server used as the DeltaV system historian, providing enterprise historian functionality while fully integrated into the DeltaV system engineering and operator functions.
- **Backup and Recovery.** Provides data backup and disaster recovery for DeltaV system and associated process control data.

Related 3rd Party Products

- OSIsoft Enterprise PI Server. Receive, archive and distribute aggregated process data from multiple DeltaV and 3rd party systems.

Prerequisites

- DeltaV v9.3 or later.
- One ProfessionalPLUS Station in each DeltaV Zone system.
- The Inter-Zone Server requires a DeltaV workstation. A variety of hardware is available to meet your specific requirements. Call your local sales office for details.
- Enterprise historian functionality requires the purchase of the OSIsoft PI Server and PI DeltaV Smart Connector interface from OSIsoft.

Application Notes

- Alarm Help supports alarms originating from zones that are not in the same zone as the Operator Workstation, beginning with the DeltaV V13.3.1 release

Emerson
North America, Latin America:
+1 800 833 8314 or
+1 512 832 3774

Asia Pacific:
+65 6777 8211

Europe, Middle East:
+41 41 768 6111

www.emerson.com

DELTAV™

EMERSON™