Backup and Recovery

- Best-in-class offering
- Easy-to-use Backup and Recovery solution
- Data protection and disaster recovery in a single solution
- Scalable architecture and functionality
- Centralized and remote management
- Add an additional level of security

Protect your plant data with the Backup and Recovery solution.

Introduction

Your plant produces many things, including the data required to operate, manage and document your plant processes. How do you protect this data and ensure a loss of data will not disrupt production? Emerson's Backup and Recovery solution gives you the ability to easily back up your DeltaV™ distributed control system (DCS), AMS asset management software (AMS Device Manager) and other critical files, folders and databases, all with the security of knowing you can recover this data as needed.

You have many things to worry about when operating your plant and the integrity of your plant data should not be one of them. With Backup and Recovery, you will be able to spend your time focusing on the issues that are important to your plant production. Backup and Recovery is easy-to-use and offers one solution for data protection and disaster recovery, all with a single, user-friendly interface. If disaster strikes, you now have the ability to recover quickly and easily.

Based on industry-leading Acronis® Cyber Backup software, Emerson's Backup and Recovery solution is scalable from the smallest system with a single PC to the largest multiple-system facility with hundreds of PCs.

Benefits

Best-in-class offering: Emerson's Backup and Recovery is based on the Acronis Cyber Backup software. Emerson has partnered with Acronis to deliver a best-in-class offering for Backup and Recovery for the DeltaV DCS and AMS software. Acronis is a leading provider of easy-to-use disaster recovery and data protection solutions for physical, virtual and cloud environments. With Emerson's Backup and Recovery solution, you can protect your digital information, maintain business continuity and reduce downtime.

Easy-to-use Backup and Recovery solution: Backup and Recovery is easy to install, use and manage. Backup plan templates are provided for the DeltaV DCS and AMS software so you can be assured that all the data required to back up these systems is known and easily accessible. The backup plan templates may also be modified to add your specific files, folders or databases that require backup. The backup plan templates may be imported directly into the application, modified, exported and imported into other PCs running Backup and Recovery.

Improved virtualization compatibility: Key features now allow users of Backup and Recovery in virtual environments more flexibility and easier, more efficient backup and restores. Backup and Recovery will automatically track and save only changed blocks of information in the backup to significantly reduce the recovery time of virtual machines.

Easily restore images between physical and virtual platforms for testing or migration purposes. Get up and running again up to two times faster with a complete virtual system image that is ready for reinstallation utilizing smart technology that automatically detects the bare-metal hypervisor boot requirements.

Data protection and disaster recovery in a single solution: Backup and Recovery addresses both your backup and disaster recovery needs in a single application. Many other backup solutions require separate applications for backup and disaster recovery, unnecessarily complicating the solution and doubling the effort to install, use and manage the solution. By providing data and full image backup in a single application, you can protect your operating system, applications and files from everyday occurrences such as individual file loss all the way up to entire system failure due to natural disaster, human error or theft. By using Acronis' easy-to-use, patented disk imaging technology, servers and workstations can be recovered in minutes—not hours or days—helping to keep your plant up and running.

Scalable architecture and functionality: Backup and Recovery will meet your data backup and disaster recovery needs. From the smallest system to the largest multiple-system facility, Backup and Recovery can scale from one to hundreds of PCs. And once you have installed Backup and Recovery in your plant, it is easy to add new workstations, servers or complete systems to your existing Backup and Recovery system architecture. Regardless of your system size, Backup and Recovery will grow with you with its integrated, easy-to-use software and the ability to purchase more licenses.

In addition to data backup and recovery, optional functionality is available to eliminate the dependency on a specific type of PC platform or PC hardware to recover your data, giving you the ability to replace a failed workstation or server with a newer model. Backup and Recovery also includes an option to minimize data storage space and enhance backup performance by only storing the same piece of data one time.

Centralized and remote management: Backup and Recovery includes the ability to back up and manage multiple servers and workstations from a central location and from this same central location to deploy the backup agent software to the servers and workstations that require backup. With a central management server, you can simplify and control backup and recovery operations for hundreds of PCs.

Product Description

Backup and Recovery is an easy-to-use, easy-to-manage enterprise class data backup and disaster recovery solution for your DeltaV DCS and AMS software, and other critical files, folders and databases. Sold and supported by Emerson, the Backup and Recovery solution is based on industry-leading Acronis Cyber Backup software. Emerson's Backup and Recovery solution includes Backup Plan Templates for the DeltaV DCS and AMS software.

The Backup Plan Templates include all the data files, folders and databases required to back up and recover DeltaV workstations and AMS software applications.

Backup and Recovery includes many standard features that you would expect in a best-in-class data backup and recovery solution. Centralized software deployment and management, flexible data backup options to allow full or incremental backups, the granularity to back up individual files and folders, and a full image backup are just a few of the available features. The benefits of Backup and Recovery are equally numerous. Backup and Recovery may be deployed from a central location, easing the software installation process. The data being backed up from each server and workstation may be managed from a central location and/or from any number of remote locations, and any missing or corrupted data can be restored from the same central or remote locations, easing the backup management process. The Backup Plan Templates can be imported into the application via the user interface and, once imported, the Backup Plan Templates may be modified and exported for use on other systems, easing the backup configuration process.

Backup and Recovery Features

Backup and Recovery includes a number of features to enhance your backup and recovery functionality. One feature is ***Universal Restore***™. Universal Restore allows you to recover all your data and applications onto a different make or model workstation or server than the one that was originally backed up. Universal Restore captures all your system parameters, so there is no need to reconfigure anything when you switch. Simply insert the required device drivers during the recovery process. Universal Restore will give you peace of mind knowing that data backed up on today's PC hardware can be recovered on tomorrow's PC hardware.

Any time you restore a backup image from one PC to another PC, you must ensure that the PC being restored has an appropriate operating system license. All DeltaV PCs purchased from Emerson have the appropriate operating system licenses, but the DeltaV PCs use two operating system licensing models. If you use Universal Restore, you can only restore a backup image to a PC that is licensed with the same operating system license model as the PC where the backup image was taken. For more information on the DeltaV system PCs and operating system licensing models, refer to the Emerson white paper "DeltaV workstation operating system licensing."

Deduplication is another feature of Backup and Recovery. When backing up DeltaV DCS workstations and servers, you may find a lot of duplicated data; for example, backing up multiple operator stations.

Over time, huge amounts of duplicate files may accumulate, which can take up an enormous amount of storage space, not to mention the network bandwidth required to transfer all this duplicate data.

Deduplication allows you to store the same data only one time, regardless of how often the data is backed up across your workstations and servers.

Backup and Recovery includes the ***Emerson Backup Plan Templates***, a library that may be imported into the management server to create backup plans for conveniently organizing backups of DeltaV data. A backup plan contains a set of rules to specify the data to back up, the name and location of the archive, scheduling, and other options. The Emerson Backup Plan Templates are XML files, some of which have associated batch files. You can import and modify an Emerson Backup Plan Template which allows you to export a backup plan for future use, customized for your DeltaV network.

New for Backup and Recovery v4.3: the Active Directory license will now be included in the server license so there is no need to purchase the Active Directory license separately.

The Active Directory License will allow customers to back up and recover domain controllers in both physical and virtual environments by installing the Agent for Active Directory on a domain controller.

The Agent for Active Directory creates an application-aware disk backup also known as a single-pass backup. While doing a backup, the Agent for Active Directory adds Microsoft Active Directory metadata to the resulting backup file. The agent enables you to extract Active Directory files from a single-pass backup without recovering the entire disk or volume. After that, you can replace the corrupted files with the extracted ones.

The Active Directory add-on license works in concert with a server license when applied to a physical domain controller. Consequently, if physical domain controllers are to be used with a virtualized system, then an active directory license and a server license is required for each physical domain controller.

The Virtual Host license allows customers to back up and recover all the virtual machines on their Virtual Host by installing the Agent for Virtual Host directly on the Hyper-V host. You are no longer required to purchase a server or workstation license for each virtual machine. A Virtual Host license must be purchased for each host machine where the Hyper-V agent is installed. The Agent for Hyper-V license will also allow for installation of the Agent for Windows on each virtual machine for file, folder and disk level backups.

Configure a dedicated network to handle file transfers, either for a backup or when recovering a backup. The storage of backups can be on the management server or on shared storage that is not used for DeltaV virtual machines. This storage can be shared with other backups, provided you maintain separate archive storage locations.

Please note that if you are ordering the virtual host license for a virtual system, the Active Directory agent is also included with the Hyper-V license for use with virtual domain controllers only at no extra cost.

If you have a hybrid installation that consists of multiple physical and virtual systems, the physical systems can share a Backup and Recovery management server but the cluster management server domain using the virtual host license(s) must have its own, dedicated management server/license server. The physical and virtual systems in this hybrid configuration can share a storage node if the physical and virtual systems have their own dedicated vaults within the storage node.

These new capabilities expand the versatility of the product when working with virtual environments.

Backup and Recovery Architecture

Backup and Recovery includes several components: a management server, a license server, a management console, centralized vault(s), storage node(s), a PXE server, and the backup agents that run on the workstations and servers being backed up. The management server is used to manage the backup agents and the data storage. The license server manages the Backup and Recovery licenses for the backup agents deployed on each PC being backed up. The management console is the application user interface. The centralized vaults and storage nodes are where the backup data files are stored. The PXE server is used in data recovery to boot PCs through the network. The backup agents are installed on the workstations and servers and execute the backup tasks.

With Backup and Recovery, two supported architecture options are available, each defined by the location of the management server. In the first option, the management server is installed on a non-DeltaV PC located on the network level above the DeltaV area control network ("level 2.5"). The management server is located within the DeltaV system firewall and used to back up workstations and servers within a single DeltaV DCS or possibly multiple DeltaV systems that share the same level 2.5 network and reside within the same system firewall. In this option, all of the Backup and Recovery components may be installed on the management server PC or, for larger systems, may be necessary to install the centralized vault(s) or storage node(s) on a separate PC or network storage device. The DeltaV workstations and servers are connected to the management server via the level 2.5 network created by configuring the third network interface card (NIC) in the DeltaV workstations and servers. This option may be desirable for larger systems where several DeltaV, AMS software, and/or third-party workstations and servers on level 2.5 require backup. See Figure 1.

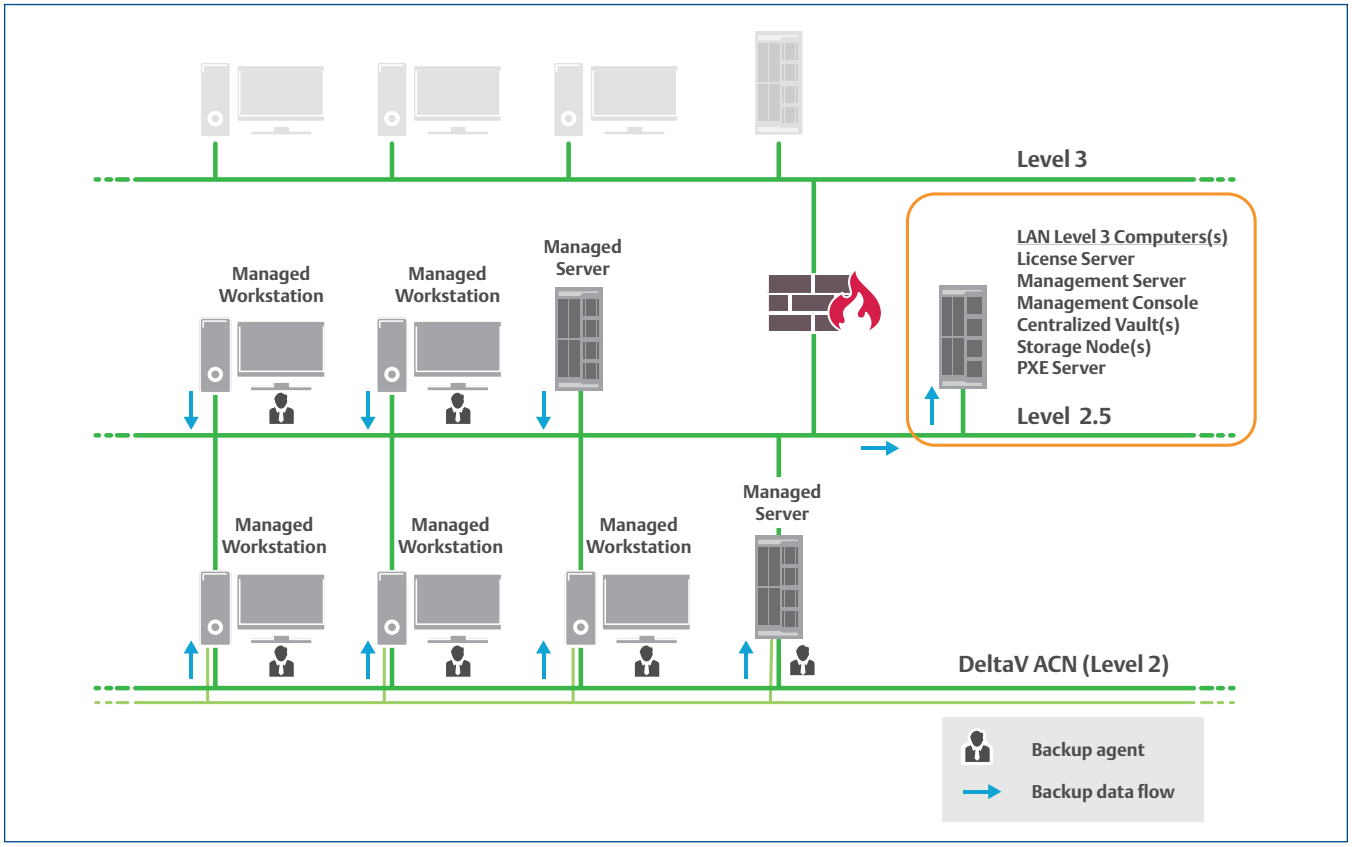

Figure 1 *— Backup and Recovery with Management Server located on a Level 2.5 data backup network.*

In the second option, the management server is installed on a non-DeltaV PC located on the plant LAN ("level 3"). The management server is located outside the DeltaV system firewall and used to back up workstations and servers within a single DeltaV system or multiple DeltaV systems that are connected to the same level 3 network and/or AMS Suite and/or non-DeltaV workstations and servers on the level 2.5 and level 3 networks. In this option, all of the Backup and Recovery components may be installed on the management server PC or, for larger systems, it may be necessary to install the centralized vault(s) and storage node(s) on a separate PC or network storage device.

The DeltaV workstations and servers are connected to the management server through the system firewall by configuring the third NIC in the DeltaV workstations and servers. This option may be desirable for large systems where one or more DeltaV systems, AMS Suite, and/or third-party workstations and servers on level 2.5 and/or level 3 require backup. See Figure 2.

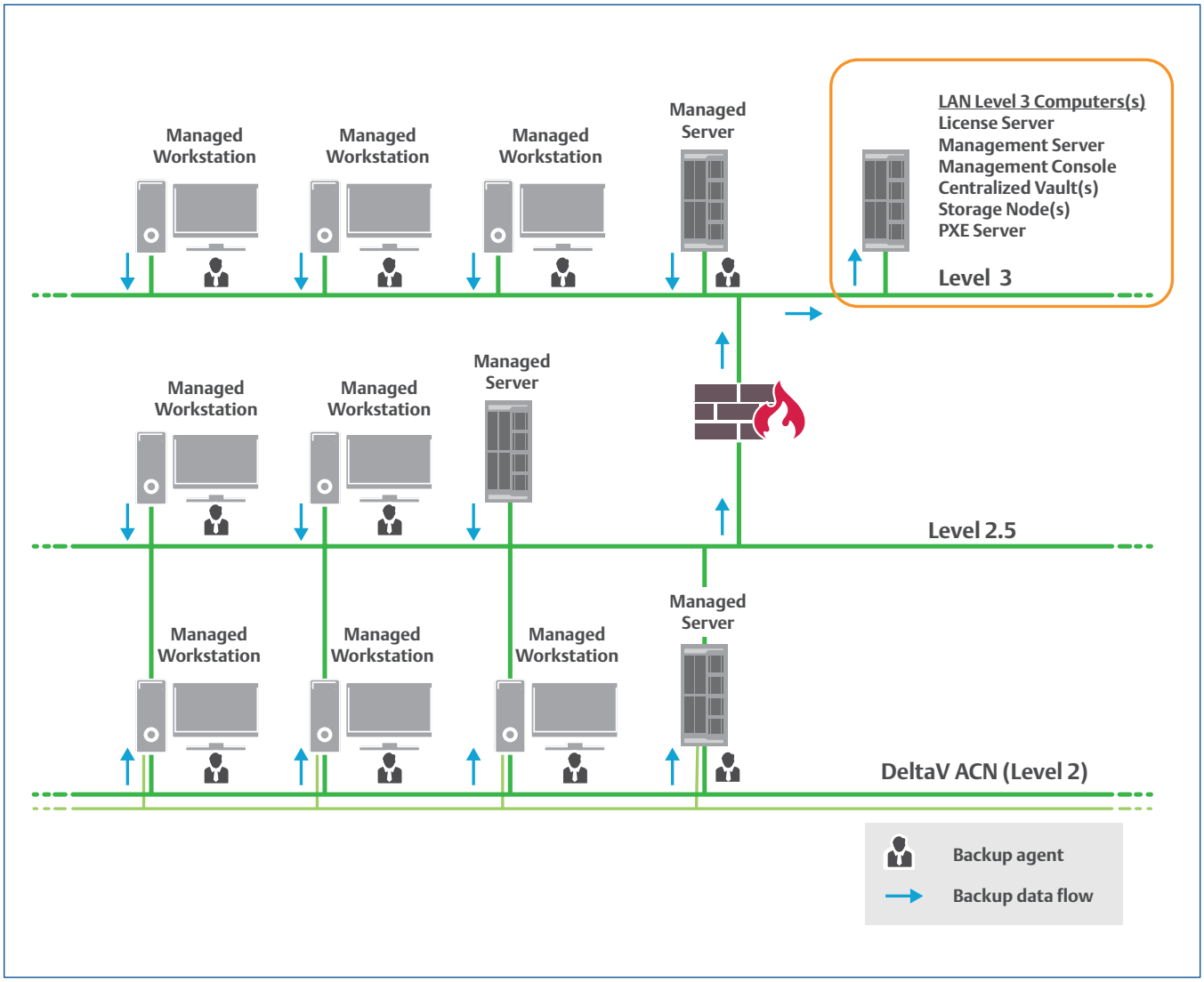

Figure 2 *— Backup and Recovery with Management Server located on a Level 3 plant network.*

While several configurations may be used with the Virtual Host license installed on a cluster management server, Emerson supports two Backup and Recovery Management Servers and license servers installed on non-host, non-domain controller, non- DeltaV computers that are dedicated to the cluster management server domain, and not managing backups for other systems. One Backup and Recovery Management Server is dedicated to host level backups on the host network and the other Backup and Recovery Management Server is dedicated to file backups for all the virtual machines on the VM network. The Backup and Recovery Management Servers cannot have any visibility to each other.

Additionally, the license servers are dedicated to this system and the license servers for Backup and Recovery can reside on the management servers. The Agent for Hyper-V is installed on each host. Configure a dedicated network to handle file transfers, either for a backup or when recovering a backup. Backups can be stored on the management server or on shared storage that is not used for DeltaV virtual machines. This storage can be shared with other backups, provided you maintain separate archive storage locations. See Figure 3.

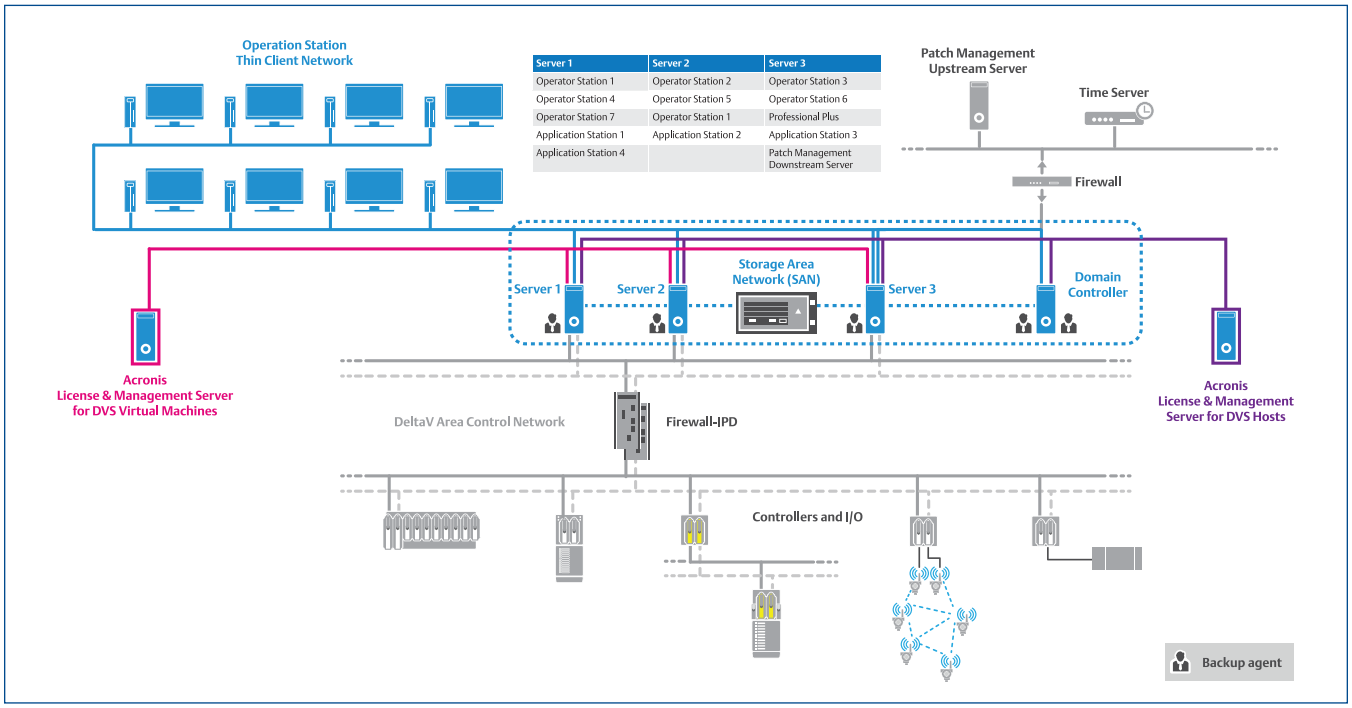

Figure 3 *— Backup and Recovery: Management Servers for Hyper-V level and VM backups on a virtualized architecture.*

Backup and Recovery Licensing

Each backup agent requires an Emerson Backup and Recovery license. The type of license is determined by the operating system in use on the PC being backed up. Thus, to license Backup and Recovery, you need to determine the number of workstations and server class PCs you want to back up. Backup agents may be used in the same system and managed by a single license server, as needed.

- Please note that Backup and Recovery v4.3 licenses are not backwards compatible to previous versions.
- Customers on previous versions of Backup and Recovery that wish to upgrade their installation to v4.3 will uninstall their version and purchase new v4.3 licenses.

Please note that moving from major versions of Backup and Recovery will require a purchase of new perpetual licenses, even with a Guardian subscription as Backup and Recovery and Guardian are independent of one another.

Cybersecurity Management Solutions

Backup and Recovery is an integral part of Emerson's Cybersecurity Management Solutions portfolio.

A comprehensive cybersecurity solution consists of many different components, each specific to reducing risks associated with various process control system functions. Emerson's Cybersecurity Management is an integrated approach to finding the best cyber solutions to fit your current process control system and existing plant security policies and procedures.

Cybersecurity Management solutions cover:

- Integrated/Manual Patch Management services
- Disaster Recovery
- Backup and Recovery
- System Health Monitoring
- Endpoint Security
- Application Control
- Network Security Monitoring
- Security Information & Event Management (SIEM)
- Smart firewalls, Smart Switches and Controller Firewalls
- On-site spare parts management
- Security consultation services
- Incident Response Services
- Development Services for IR Plan and Site Policies & Procedures Review

Reduction of risks associated with the use of these solution components minimizes the time spent on incidents and allows focus on other important day-to-day tasks.

Services Available

Emerson's Backup and Recovery solution can provide expert consultation, implementation, verification, and recovery support for Emerson's Backup and Recovery solution.

These services are offered at various levels to accommodate different customer needs. For example, some customers prefer to have an entire solution implemented by Emerson while others only require consultation to get them started. To allow for this flexibility, each installation of Backup and Recovery Services is quoted through your local Emerson representative.

Backup and Recovery – Implementation Service. This service implements an entire Backup and Recovery solution for customers who choose to outsource it. This service installs the Backup and Recovery solution such that your automation system is regularly backed up and capable of being recovered in the event of data failure. The basic process would be to evaluate needs with the site, create an implementation plan, install equipment and software and ensure it is operational, configure software, and verify proper operations.

Backup and Recovery – Consultation Service. This service is for customers interested in performing the Backup and Recovery implementation themselves but seek input on important decisions like topology, data to backup, and configuration settings.

Backup and Recovery – Verification Service. This service periodically verifies that the backup mechanism is properly backing up the system and the system is capable of being recovered from the backups.

Emerson verifies that backups are performed in accordance with the schedule specified by the customer and that backups are capable of being properly restored. The first activity can be accomplished by examining the vault where the backups are stored.

The second activity requires restoration and inspection of the backups. The service provider will use your backups and spare hardware (spare server and spare workstation models) or virtual machine equivalents to test the image backups and restore individual data backups for each DeltaV™ subsystem (i.e. Continuous Historian, Batch Historian, Event Chronicle, Objectivity, etc.).

Backup and Recovery – Recovery Service. This service helps customers recover backed-up data and restores the operability of the automation system in the event of a data failure. Whether a customer requires just a single file to be recovered or an entire system, this service can recover data both large or small.

Ordering Information

This service requires a written scope of work, deliverables, timing and budget. A service request must be received and reviewed by Emerson. Emerson will in turn provide a written proposal to the customer for review and acceptance.

v4.3 Ordering Information

Description	Model Number
Emerson Backup and Recovery Workstation v4.3, License Pack Only	VF1062W
Emerson Backup and Recovery Server v4.3, License Pack Only	VF1062S
Emerson Backup and Recovery Server Evaluation[1]	VF1062E
Emerson Backup and Recovery v4.3 for Virtual Hosts, License Pack Only[2]	VF1062V

Notes:

[1] The trial evaluation media provides a fully functional, 30-day time limited version of Backup and Recovery server and can be used to evaluate the Backup and Recovery software on a PC running any of the supported Windows operating systems. To upgrade to the full version of Backup and Recovery, simply order the appropriate licenses and apply the new licenses to the license server. Evaluation media is purchased from Emerson.

[2] The Agent for Hyper-V license will also allow for installation of the Agent for Windows on each virtual machine for file, folder and disk level backups.

Ordering Process

Order a quantity of Emerson Backup and Recovery licenses for the number of workstations and servers that require backup, using the model numbers shown above in table. You will receive a license certificate for each workstation and server license ordered. The Media Pack is required for installation of the Backup and Recovery software and can be downloaded from Guardian.

Detailed instructions on the Backup and Recovery software installation and licensing process are provided in the installation guide included in the Backup and Recovery Media Pack.

Backup system licensing examples

1. A single DeltaV distributed control system requires Backup and Recovery for the Professional Plus station and two Application Stations. You want a single license server due to the system size and you want the license server to reside on a non-DeltaV workstation at level 2.5. Order three Backup and Recovery licenses, one for each DeltaV workstation, using the operating system in use by each DeltaV workstation. Install and run the Backup License Utility to obtain the license order code. Email the license order code, the Emerson sales order number, the DeltaV system ID, and the three license serial numbers to Emerson to receive an encrypted license file containing three Backup and Recovery license keys.
2. Two DeltaV distributed control systems require backup for the Professional Plus station, three Operator Stations, one Application Station on each system and one central AMS software server. You want a single license server for both DeltaV systems to enable centralized license management and you want the license server to reside on a non-DeltaV workstation at level 2.5. Order eleven Backup and Recovery licenses, one for each DeltaV workstation in each system and one for the AMS software server, using the appropriate operating system in use by each DeltaV workstation and AMS server. Install the Backup License Utility on the non-DeltaV workstation and run the Backup License Utility to obtain the license order code. Email the license order code, the Emerson sales order number, the DeltaV system ID for the system you wish to associate with Backup and Recovery technical support, and the eleven license serial numbers to Emerson to receive an encrypted license file containing eleven Backup and Recovery license keys.

DeltaV Distributed Control System Version and Operating System Compatibility

DeltaV DCS Backup and Recovery v4.3	DeltaV v13.3.1 and v14.3		Non-DeltaV Install	
	Win 10	Server 2016	Win 10	Server 2016
Advanced Workstation	YES	NO	YES	NO
Advanced Server	NO	YES	NO	YES

Notes: The backup agents and management server are supported for use on the DeltaV DCS versions running the operating systems as listed in the table above. The backup agents and management server are supported for use on non-DeltaV workstations and servers running the same versions of the operating systems listed in the table above.

Management Server Requirements

Software: See the DeltaV Distributed Control System Version and Operating System Compatibility chart for the operating system requirements for sing Backup and Recovery on DeltaV and non-DeltaV PCs.

Hardware: A Dell R740 or later model server with the following specifications is recommended for installing the Backup and Recovery management server on a DeltaV or non-DeltaV PC:

- CPU: Intel Xeon, 2.0 GHz (minimum)
- RAM: 16 GB (minimum), 1333MHz UDIMM
- Hard disk drive: 6 x 600 GB 15K RPM SCSI, RAID 10

Related Products

- DeltaV Distributed Control System
- AMS Device Manager
- DeltaV Virtual Studio

Prerequisites

- The Backup and Recovery Media Pack is required for installation of the Backup and Recovery software and should be downloaded digitally from Guardian.
- Backup and Recovery v4.3 is available for use with DeltaV v13.3.1, v14.3 and v14.3 systems using DeltaV Live as well as R6.
- Backup and Recovery v4.3 is available for use with the latest applicable and supported DeltaV Virtual Studio and updated as described in the DVS hotfix release notes.
- A Dell R740 or later model server is recommended for use as the management server. Recommend that no other non-Backup and Recovery applications be installed on the management server.
- Backup and Recovery server may require additional storage for the backup data. Please make accommodations for properly sizing additional storage for your data.

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