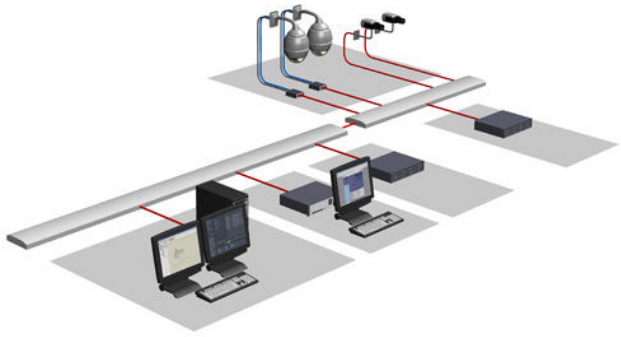
MVM-BVRM Video Recording Manager v2.30

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Invented for life



- Distributed storage and configurable load balancing
- iSCSI disk array failover for extra reliability
- Used with all Bosch Video-over-IP cameras and encoders
- Configuration support for all Bosch disk arrays (DSA and DLA series)
- Integration of 3rd Party Cameras (ONVIF, RTSP, JPEG)

Bosch Video Recording Manager (VRM) provides a Distributed Network Video Recorder solution, eliminating the need for dedicated NVRs and signaling the second generation of IP network video recording. VRM supports iSCSI-based storage systems and Bosch Video-over-IP devices (IP cameras and IP video encoders).
VRM introduces the concept of a storage virtualization layer. This abstraction layer enables VRM to manage all of the individual disk arrays in the entire system as a single “virtual” common pool of storage, which is intelligently allocated as needed.
VRM eliminates the need for classic Network Video Recorders (NVRs) and their associated server hardware, operating systems, and anti-virus software, as well as the ongoing software patches and updates these systems require.
This new NVR technology makes installation, operation, and maintenance much easier while reducing the total cost of ownership.

System Overview

The Video Recording Manager comprises:
- Recording Management Service (VRM Server)
- Configuration Manager
- Video Streaming Gateway (VSG)

The central Recording Management Service runs as a service on Microsoft Windows platforms. Bosch recommends running VRM Server on a dedicated server/hardware platform.
VRM offers system-wide recording, monitoring, and management of Bosch iSCSI storage, video encoders, and cameras.
VRM software supports Bosch H.264 and MPEG-4 IP video devices including all encoders, Dinion and FlexiDome IP cameras, as well as AutoDome and Extreme IP cameras and the Bosch HD cameras. With the new Video Streaming Gateway component 3rd party cameras supporting either ONVIF, RTSP or JPEG protocol are supported. Supported storage subsystems include the Bosch iSCSI-based DSA, DSA E-Series and DLA Series disk array systems. The iSCSI disk arrays can be attached anywhere on a standard IP network.
VRM offers additional redundancy and data availability by supporting Automated Network Replenishment (ANR) with Bosch Video-over-IP devices (BVIP Firmware 4.0 or later required).

Optimal Performance
The Video Recording Manager offers a high-performance, flexible, scalable, and a highly reliable iSCSI storage management solution.
Optimized performance is obtained by the use of intelligent addressing on a block level, which also allows for load balancing of the video recording to all available storage blocks located on any storage array in the system.
Load balancing is provided with respect to the bandwidth and the number of iSCSI connections and is configurable per IP address (iSCSI target).

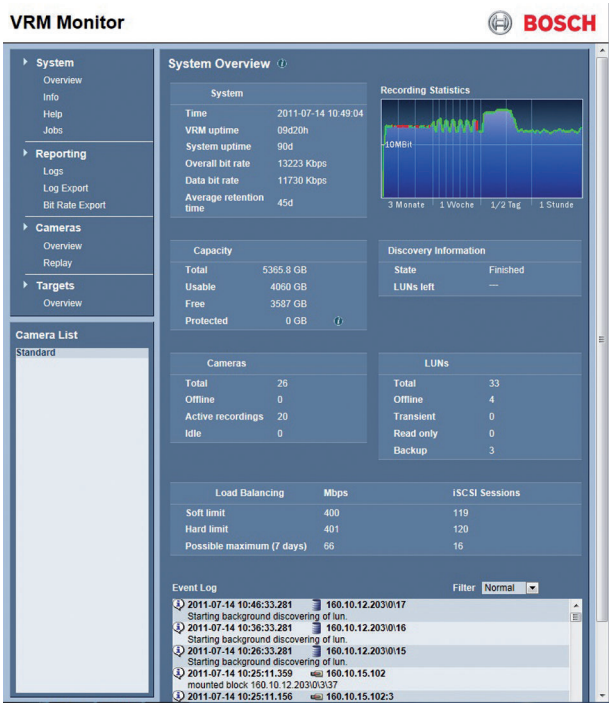
Logical Virtualization
The VRM virtualization layer allows the scalability of storage beyond the physical limits of a single storage subsystem. This logical abstraction layer means that each camera can use any storage space it actually needs, rather than an allocated, arbitrary, discrete chunk ahead of time. Adjust retention times of video data as required.

Fast Recording and Retrieval
VRM provides fast and flexible retrieval via a search database of recordings and metadata. Metadata is a form of data that describes other data such as events, ATM/POS information, and video content analysis data. The metadata is recorded with the video data and provides a fast and efficient way for the search engine, in the playback client, to quickly locate specified video clips. The database also keeps track of the location of recording blocks. If this database is lost, VRM can recreate the database by reading the stored metadata, thus providing a self-healing capability.

Distributed Storage
VRM not only provides for redundant management of metadata, it also introduces a significant enhancement of overall reliability and availability. By providing redundancy for storage provisioning and a failover design for the central recording management service, there is no single point of failure. In addition, unlike classic NVR systems, VRM scales without requiring additional PCs. This greatly reduces the risk of system failures.

Functions

VRM Server
VRM Server, with the central Recording Management Service, maintains a database containing the recording source information and a list of associated iSCSI drives. The central monitoring includes a Web-based user interface for status monitoring. This provides system status overview, recording status information, as well as for live view and recording preview for single cameras.



VRM Server

Configuration Manager
The Configuration Manager allows for central configuration of the network storage subsystems, recordings (including schedules), data rate, frame rate, stream, and privileges, as well as for managing user accounts.

Playback Client
For replay use Bosch Video Client BVC Version 1.3.1 or later. The BVC is available on the Bosch ST web site www.boschsecurity.com.
For more information about Bosch Video Client BVC, see the product specific documentation.

Integration of 3rd Party Cameras
VRM with its new component **Video Streaming Gateway** offers the option to integrate cameras that support ONVIF, standard RTSP or JPEG protocols. The Streaming Gateway is intended for live viewing and VRM iSCSI based recording of cameras in low bandwidth environments or of 3rd party cameras supporting one of the above mentioned protocols.

Automatic Network Replenishment ANR
A VRM server can perform maximum 3 ANR jobs simultaneously. If you configure multiple ANR jobs for 1 device (for example with 4 channels), these jobs are performed one after the other. This avoids overload of the device. The number of ANR jobs cannot be increased by a secondary VRM server. The maximum performance is 24-times of replay, the actual performance may be limited by the capabilities of the encoder/camera.

ANR is only effective for data within the minimum retention time of the system. Recording gaps outside the minimum retention time will not be considered.

Backup of data through VRM
A VRM server can execute maximum 5 backup jobs in parallel. The number of backup jobs cannot be increased by a secondary VRM server. The maximum performance is 24-times of replay. Consider this for bandwidth estimation of the iSCSI targets.
The backup functionality is not supported by BVMS or the BVC replay client.

Design Recommendations
Load Balancing (if VRM is configured in "All Mode")
VRM provides a new server based "All Mode" (Automatic Mode).
If the previous video device based "All Mode" is used the following design recommendations should be observed:
When calculating the number of storage arrays for VRM environments we strongly recommend adding an additional iSCSI target (n+1 calculation) or using the “Failover Mode”.
This recommendation is especially important when using the DLA Series because these storage systems provide a lower reliability and availability than the DSA Series.
ANR
The first implementation of ANR in VRM is suited to protect against single short network outages. One network outage must be longer than 10 seconds to be detected by the ANR mechanism. If the outages are shorter potential gaps are not detected and recording is not refilled.
ANR is not suited to be used for:

- Wireless applications because of frequent network outages.
- Mobile applications because of long outages with large recording gaps which takes very long to be filled.

Licensing
Existing VRM 2.0 licenses can be used.

Installation/Configuration Notes

VRM Components
The Video Recording Manager consists of the following components which may be installed on separate systems.

- VRM Server (central Recording Management Service) with Web interface for VRM Monitor
- Configuration Manager
- Video Streaming Gateway

VRM Monitor

- Displays overall system status information, including uptime, bit rate, and retention times.
- Provides status information on recordings and storage.
- Displays live view and recording previews for a single camera.

Configuration Manager

- Allows configuration of the iSCSI storage subsystems.
  - Bosch DSA Series (NetApp Storage Systems)
  - Bosch DLA Series (Bosch OEM Disk Arrays)
- Allows configuration of recording parameters, including schedules, data rates, frame rates, streams, and privileges.
- Allows management of users and groups with privileges and roles.
- Allows configuration of load balancing parameters (bandwidth and iSCSI connections) per disk array (IP address).

Technical Specifications

Bandwidth	1 Gbit network (recommended)
Supported languages	Arabic, Czech, English, German, Danish, Dutch, Finnish, French, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Portuguese, Polish, Russian, Spanish, Simplified Chinese, Swedish, Thai, Traditional Chinese and Turkish

VRM Server (running as a service)

Supported operating systems	• Windows 7 Ultimate, Professional Edition 32-bit, 64-bit versions • Windows Server 2003 R2, Standard Edition, 32/64-bit versions • Windows Server 2008 R2, Standard Edition 64-bit versions • Windows Storage Server 2008, Standard Edition 64-bit versions

Hardware requirements

CPU	Quad-Core Intel Xeon Processor E5606 (2.13 GHz/4-core/8 MB/ 80 W)
RAM	1 GB or more
Graphics card	VGA or SVGA-compatible
Network adapter	1 Gbps
Installation	Windows administrator rights
Recommended Bosch Server Hardware	• MHW-S380R7-MCDE/ MHW-S380R7-HCDE • MHW-S380R7-MCUK/ MHW-S380R7-HCUK • MHW-S380R7-MCUS/ MHW-S380R7-HCUS

VRM Monitor

Browser	Replay only with Microsoft Internet Explorer, v8.0 or 9.0
Network adapter	1 Gbps
Software	DirectX 9.0c/MPEG Active X

Configuration Manager

Supported operating systems	• Windows XP Professional SP3, 32-bit versions • Windows 7 Ultimate/ Enterprise, 32/64-bit versions • Windows Server 2003 R2, Standard Edition with SP2, 32/64-bit versions • Windows Server 2008 R2, Standard Edition 64-bit versions • Windows Storage Server 2008, Standard Edition 64-bit versions
Hardware requirements	
CPU	Intel Pentium (minimum 2.80 GHz) to Intel Core i3/i5/i7; Intel Xeon Dual Core or Quad Core (X3 or E3 Families)
RAM	256 MB or more
Graphics card	VGA or SVGA-compatible
Network adapter	1 Gbps
Software	DirectX 9.0c
Installation	Windows administrator rights

Note:
One VRM supports:
- 2048 channels
- 1 PB storage (net capacity)
- 40 disk arrays (recommended)
- maximum 120 iSCSI targets supported

When planning for larger environments we strongly recommend using large sized disk arrays instead of a large number of small disk arrays (vertical scaling instead of horizontal scaling). For systems with more than 40 disk arrays, please contact a Bosch Design Engineer. iSCSI based storage systems not qualified by Bosch are not supported.

Ordering Information

MVM-BVRM-016
Bosch VRM base package with a 16-camera license single-pack. VRM 2.0 licenses can be used.
Order number **MVM-BVRM-016**

MVM-SVRM-BAK
Bosch VRM Failover license. VRM 2.0 licenses can be used.
Order number **MVM-SVRM-BAK**

MVM-XVRM-016
16-camera upgrade license
Order number **MVM-XVRM-016**

MVM-XVRM-032
32-camera upgrade license
Order number **MVM-XVRM-032**

MVM-XVRM-064
64-camera upgrade license
Order number **MVM-XVRM-064**

MVM-XVRM-128
128-camera upgrade license
Order number **MVM-XVRM-128**

MVM-XVRM-256
256-camera upgrade license
Order number **MVM-XVRM-256**

MVM-XVRM-512
512-camera upgrade license
Order number **MVM-XVRM-512**

MVM-XVRM-1024
1024-camera upgrade license
Order number **MVM-XVRM-1024**

MVM-XVRM-2048
2048-camera upgrade license
Order number **MVM-XVRM-2048**

MHW-S380R7-MCUS Bosch VMS Central Server Mid-range (US)
High performance upper-mid-range server, American English localization included
Order number **MHW-S380R7-MCUS**

MHW-S380R7-MCDE Bosch VMS Central Server Mid-range (DE)
High performance upper-mid-range server, German localization included
Order number **MHW-S380R7-MCDE**

MHW-S380R7-MCUK Bosch VMS Central Server Mid-range (UK)
High performance upper-mid-range server, British English localization included
Order number **MHW-S380R7-MCUK**

MHW-S380R7-HCUS Bosch VMS Central Server High-end (US)
High performance high-end server, American English localization included
Order number **MHW-S380R7-HCUS**

MHW-S380R7-HCDE Bosch VMS Central Server High-end (DE)
High performance high-end server, German localization included
Order number **MHW-S380R7-HCDE**

MHW-S380R7-HCUK Bosch VMS Central Server High-end (UK)
High performance high-end server, British English localization included
Order number **MHW-S380R7-HCUK**

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