VR-N100U
Product Presentation

End-to-End IP Video Solution

Overview

- Background of JVC
- Reasons for VR-N100U Development
- Solution Overview
- Controlled and Stable Environment
- Network Topology Overview
- VR-N100U Details
- Direct Attached Storage
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- Comparison – MPEG4 vs MJPEG
- Enterprise Client Software
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- Alert Console & Map Creator Applications (OPTIONS)
- Wireless Connectivity Utilizing Microwave & WAP for Large Areas
- 802.11 Cisco Aironet Hands-Off Video to Mobile Users by Coverage
- Implementing Wireless Networks
- Summary of VR-N100U Advantages
- JVC Roadmap
- Video Storage Options

End-to-End IP Video Solution

Background of JVC

Victor Company of Japan

- Parent Company of JVC
- "JVC" is the Company Name for all Subsidiaries Outside of Japan
- Multi-Billion Dollar World-Wide Corporation
- 52% Ownership by Matsushita/Panasonic
- Technology Innovator (Examples Below)
  - > Co-Inventor of Victor Talking Machine (Mascot is Nipper the Dog)
  - > Inventor of the VHS & D-VHS Formats
- Consumer Products (Audio, Video, TV, Mobile, Computer, etc.)
- Professional Products (IP, Security, Broadcast, Video, Storage, etc.)

JVC Professional Products (USA)

- US Division Concentrating on IP Solutions

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Reasons for VR-N100U Development

1st Market Shifts from Analog to Digital Video

- Improved Video Quality
- Advancements in CCTV Peripherals (Cameras, Monitors, etc.)

2nd Migration from Time-Lapse VCR to DVR

- Advancements in Computer Systems (CPU, RAM, Peripherals, etc.)
- Random Access Digital Video
- Video Capture Cards
- Anyone Can Build Their Own DVR

3rd Migration from DVR to NVR

- Customers Require More Advanced Systems
- Improved Networking Infrastructures & Broadband Connectivity
- New IP-based Networked Cameras and Encoders for Analog CAMs
- Maximum Flexibility and Cost Savings

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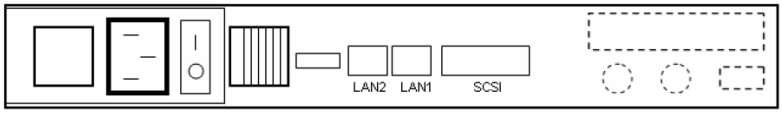
JVC VR-N100U
Network Video Recorder

1U Form-Factor VR-N100U

Front & Rear Views



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Solution Overview (1 of 2)

Appliance Technology
- Designed Specifically as a Enterprise Network Video Recorder Server
- Turn-Key (Hardware/OS/Software/Storage are Tightly Integrated)

Secure Solution
- Clients Have No Direct Access to Networked Cameras
- No Third Party Software Can Be Installed
- Firewall Protects Networked Cameras and Storage
- UNIX Platform with All Ports Are Tightly Locked Down

Server-Client Architecture
- Clients Can Only View/Access Video via the VR-N100U

Independent and Dedicated Camera Network
- All Network Cameras Directly Managed By Only the VR-N100U

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Solution Overview (2 of 2)

Highest ROI (Return On Investment) Value

- Integrates Seamlessly into Any TCP/IP Network & Supports Any Client
- No Network Upgrades Required for VR-N100U Installation
- Completely Scalable to Grow With Customer's Security Needs

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Controlled/Stable Environment (1 of 2)

Embedded Server Platform

- 4th Generation Hardware Platform
- Custom Designed "X1" Server Board
- Complete Control Over Every Hardware Component
- Onboard Multi-Drive & LVD SCSI Channels
- Onboard Dual NICs
- Onboard LCD/LED Module
- No Keyboard, No Mouse and No Monitor Required on VR-N100U

Embedded Video-Centric Server Operating System

- 4th Generation Vanilla Linux Kernal-Based Platform (Non-Windows)
- Controlled & Optimized OS (No Unnecessary Overhead)
- Closed Environment for Maximum Security
- Limited to No Outside Threats (e.g. Virus, Worm, etc.)
- No Daily Patch or Service Pack Updates Required
- OS and Applications are Stored on Non-Volatile Flash Disk

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Controlled/Stable Environment (2 of 2)

Optimized Security Application
- Intelligent Camera Management (Most Major Brands Supported)
- Virtual Matrixing
- Powerful and Flexible Functionalities

Optimized Storage Application
- Robust Storage Options
- Unique “Fast Write” Algorithm
- Unique “Fast Check” Algorithm
- Unique “Optimized Recovery” Algorithm
- Up to 105TB of RAID5 Support per VR-N100U

Open Platform
- Network Independent (Integrates into TCP/IP WIN, MAC and UNIX)
- Client Independent (Supports WIN, MAC and UNIX)
- Management via Standard Web Browser and/or Enterprise Client Software (WIN 2000/XP) with Unlimited Licenses
- Scalable for Any Environment (LAN-to-WAN & SOHO-to-Enterprise)

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Network Topology Overview (1 of 4)

Installs Like CCTV, But Delivers IP
- Integration of VR-N100U Solution is Similar to that of Traditional CCTV Systems:

Passive Analog Camera	*vs*	*Intelligent IP Camera*
Coax Cabling	*vs*	*CAT5/6 & Wireless*
Analog Multiplexor	*vs*	*Network Switch*
16 VCRs for 16 Cameras	*vs*	*One VR-N100U for 16 CAMs*
CCTV Monitor & Keyboard	*vs*	*Any Networked Client PC*
Monitor Room Access Only	*vs*	*Global & Flexible Access*

Network Friendly
- Advanced System with Straight Forward Implementation Approach
- Integrates into Existing Network Backbone
- Utilize Company Network ONLY when Viewing Live or Archived Video
- Network Status Does Not Affect Camera Recording on VR-N100U
- Automated & Seamless Wireless Integration (e.g. Satellite, Microwave)

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Network Topology Overview (2 of 4)

VR-N100U Network Front Channel (LAN1)

- Single Static IP Address for Integration Into Company Network (Setup via Web Browser, WIN 2000/XP Client Software, Front LCD)
- Wired to LAN via Category 5/6 Cable
- Looks Like a Standard Network Server
- Operates as an Appliance (Dedicated Video Surveillance Device)
- Interface Between Clients and Networked Cameras
- Auto-Discovery and Self-Configuration of Cameras

VR-N100U Camera Back Channel (LAN2)

- Private Independent Camera Network Managed by VR-N100U
- Maximum of 16 Networked Cameras per VR-N100U
- Camera Connectivity can be Wired and/or Wireless
- Standard Network Switch (Unmanaged Layer 2 or Managed VLAN) Attaches Cameras to the VR-N100U

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Network Topology Overview (3 of 4)

Localized VR-N100U

- Networked Cameras are Installed in the Same General Location as the VR-N100U
- Advantage is that Any Broken Link on the Main Network Will Have No Effect on the Video Recordings
- Disadvantage is that Any Maintenance Will Require Deployment to that Local Location (if Locations Are Far Distances From HQ)

Centralized VR-N100U

- Networked Cameras are Installed in a Remote Location from the VR-N100U
- Advantage is that the VR-N100U can be Installed In a Centralized Room with Other Server Equipment for Easy Maintenance and Monitoring
- Disadvantage is that Any Broken Link Between the Remote Network Cameras and the VR-N100U Will Affect Video Recordings

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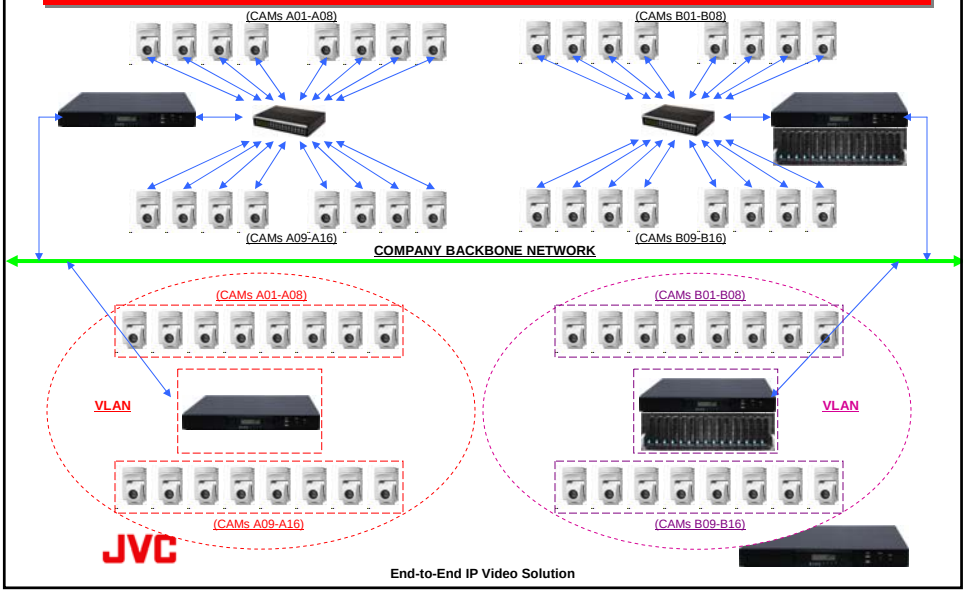
Network Topology Overview (4 of 4)



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VR-N100U Details (1 of 2)

Pure IP-Based System
- 1st System to Support All Native IP Cameras & Analog Encoders

Self-Configuring
- Automated Camera Discovery during Installation and Maintenance

Secure & Reliable Transmission
- Offers Point-to-Point 128-bit Encryption for Video and Data
- Video Quality and Integrity by Utilizing MJPEG
- Multi-Level User Privileges

Automation
- Scheduler-Based Recording Control, Automatic PTZ Preset Tour

Camera Protection
- All IP Cameras and/or Encoders are Protected by System Firewall

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VR-N100U Details (2 of 2)

Power Search Features
- Random Access, Snapshots, Pre-authored ISO Image Creation w/MD5

Feature-Rich Camera Functions
- Motion Detection, Optical PTZ, Digital PTZ on Live/Recorded Video

Distributed Storage
- Internal RAID5 Storage and Multi-Terabyte External RAID5 Storage

Flexibility for 3rd Party Integration
- Integrates into Access Control, POS, Asset Tracking, etc. Applications
- Alert Console and Map Creator Options

Video Analysis Support
- Seamlessly Integrates with Object Video
- Manages Alerts from Trip Wires, Object Detection, Object Tracking

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Direct Attached Storage (DAS)

The Direct Attached Storage Module for the VR-N100U Network Video Recorder is the ONLY Storage Designed for Enterprise Video:

- 3U Form-Factor Rackmountable Units
- Supports up to 15 Drives as a Single SCSI ID Device
- Utilizes Fast and Cost Effective Serial ATA Drive
- Capacity Ranges From 1.20TB up to 7.50TB per DAS
- Offers “Optimized Recovery”
- Offers “Fast Write”
- Offers “Fast Check”

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Unique Storage Features (1 of 2)

Optimized Recovery- A unique feature ONLY to JVC

At JVC we know your video is important, so we developed software embedded in our controller that understands when a disk has failed and when the hot spare is inserted so that the system uses a recovery drive that will allow the RAID to resynchronize in a fraction of the time. When the RAID comes back online, all data is moved back to the RAID. This function is automatic and protects against loosing any data. In case of a total RAID failure the **Optimized Recovery** handles all of the recording until the RAID is brought back online.

Fast Write

This Is another unique technology that allows JVC to write 720 FPS with large file sizes. **Fast Write** is a controller algorithm that maximizes the performance of any disk attached to the controller as well as increasing the life of the disk by isolating head movement across the media. Data is written in a structured manner.

Unique Storage Features (2 of 2)

Fast Check

Whenever you have unreliable power or accidental abrupt shutdown, the **Fast Check** takes over to ensure that the File Systems do not become corrupted, while allowing 100TB of disk check to recover in a time that is as fast as 100GB of disk.

Centralized Storage Management

The video management software supports a single and central management of all Video and Storage that can be managed from any central or multiple remote points in the world.

Spare Parts

If needed, additional spare parts for the Direct Attached Storage are available for purchase for onsite usage.

Comparison – MPEG4 vs MJPEG

MPEG4

- Stream of Inter-Framed Images (I,B,P frames = Group Of Pictures)
- Easily Corruptible Video (Seconds-to-Minutes) due to Dropped Network Packets
- Video Must Be Encoded From Source and Decoded for Viewing
- Requires 3~4Mbps to Deliver Quality Streams for Video Analysis & Surveillance
- Unable to Decode Multiple Streams due to Heavy CPU Requirements

CONCLUSION:

Good for Broadcasting Application (e.g. Internet) where Video Continuity and Integrity are *NOT* Critical

MJPEG

- Continuous Stream of Independent and Complete Video Images
- Data Integrity During Transmission and on Storage Medium
- Video is Never Manipulated from Source (No Encode/Decode Needed)
- Quality Video is Achieved at Lower Bandwidths with Self-Contained Images
- Client Requires Minimum Processing Power to View Multiple (e.g. 16) Streams

CONCLUSION:

Good for Security (e.g. Airport) where Video Clarity, Integrity and Reliability are EXTREMELY CRITICAL

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Enterprise Client Software (1 of 6)

Application

- ZView Software
- Windows 2000/XP-based Enterprise Client Software
- Alternative to Using Your Web Browser Only

Software License

- JVC Includes Unlimited User License for ZView Application with Each VR-N100U

Usage

- Powerful Enterprise Management Tool
- Applicable for All Level of Users (Viewers, Operators, Administrators)
- Virtualization of All VR-N100U and Cameras From a Single Interface
- Supports Automatic Bridging of Subnets
- TAB Display Options are Fully Configurable to Better Match User Type

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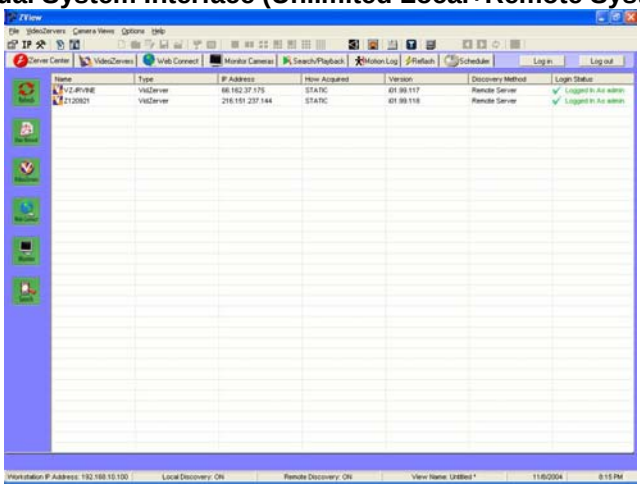
Enterprise Client Software (2 of 6)

Single Virtual System Interface (Unlimited Local+Remote Systems+CAMs)



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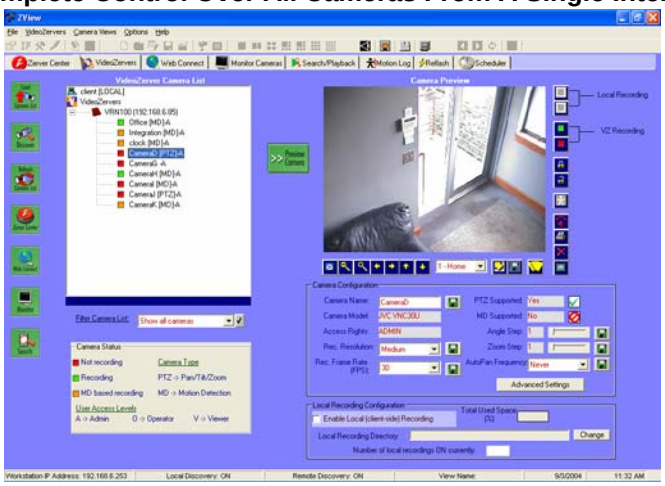
Enterprise Client Software (3 of 6)

Complete Control Over All Cameras From A Single Interface



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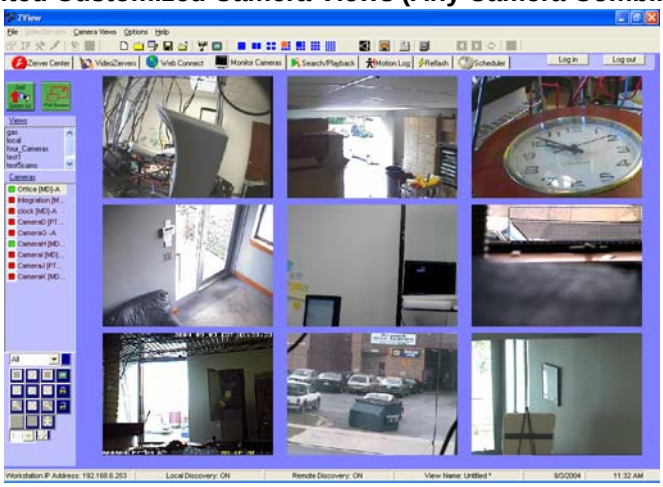
Enterprise Client Software (4 of 6)

Unlimited Customized Camera Views (Any Camera Combination)



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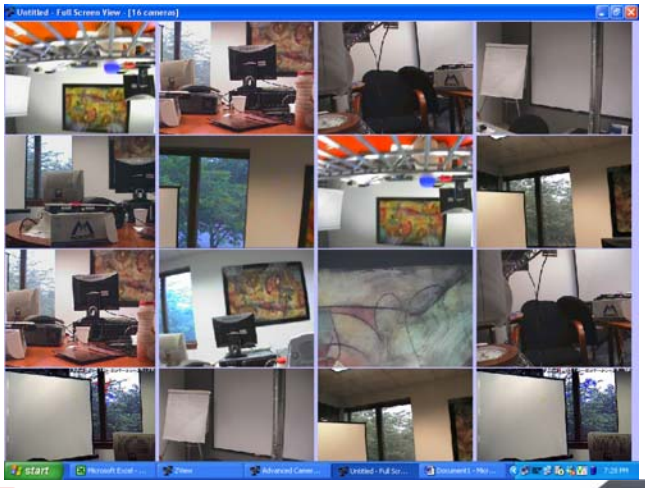
Enterprise Client Software (5 of 6)

Full Screen View (e.g. 4x4 = 16 Simultaneous CAMs per Monitor)



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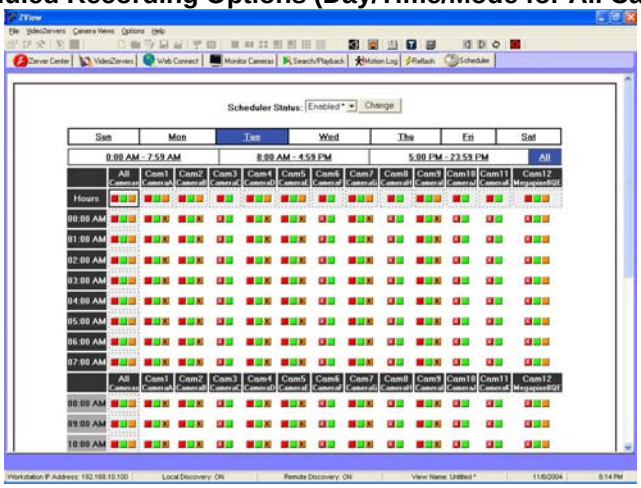
Enterprise Client Software (6 of 6)

Scheduled Recording Options (Day/Time/Mode for All Cameras)



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Web Browser Management (1 of 4)

Client Independence (WIN, MAC, UNIX)

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Web Browser Management (2 of 4)

System Administration & SMTP Alerts

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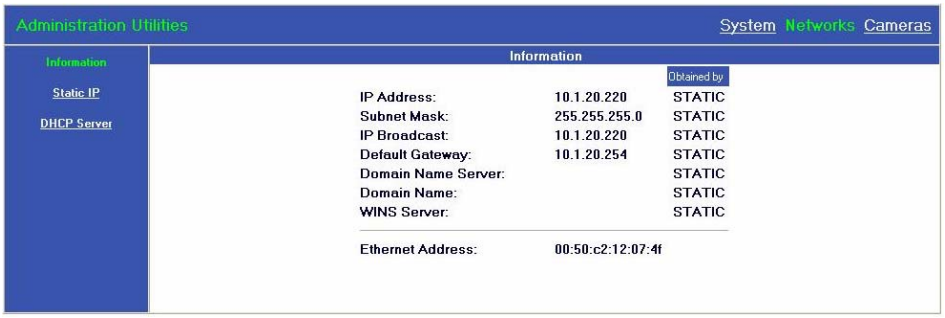
Web Browser Management (3 of 4)

Network Administration



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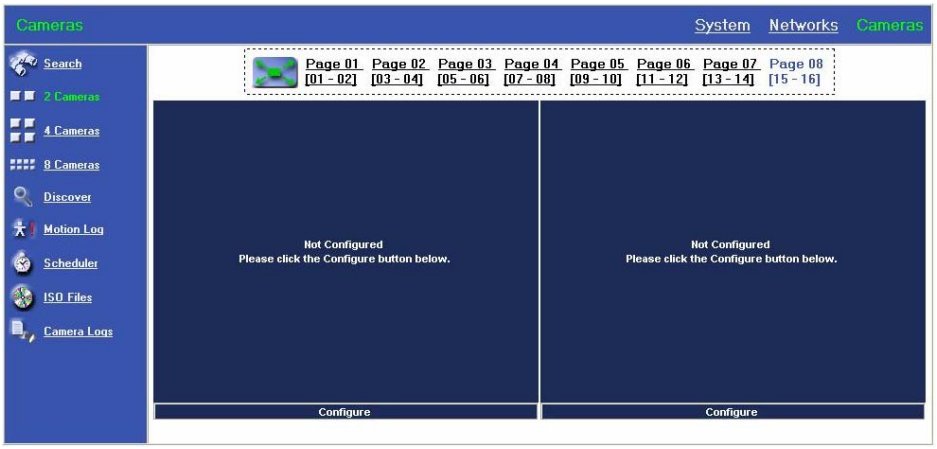
Web Browser Management (4 of 4)

Camera Administration



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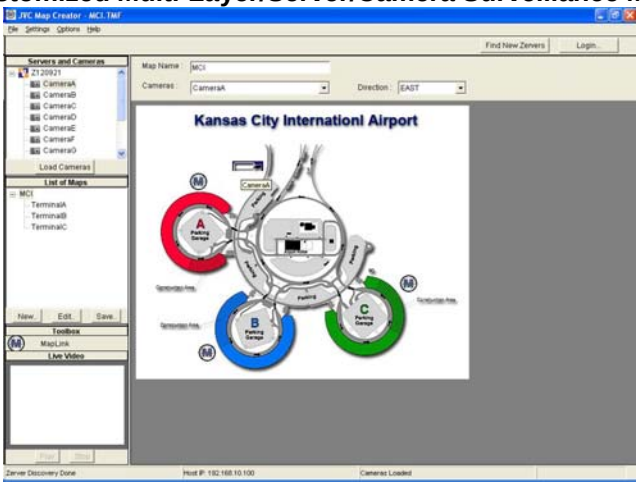
Map Creator Application

Customized Multi-Layer/Server/Camera Surveillance Maps



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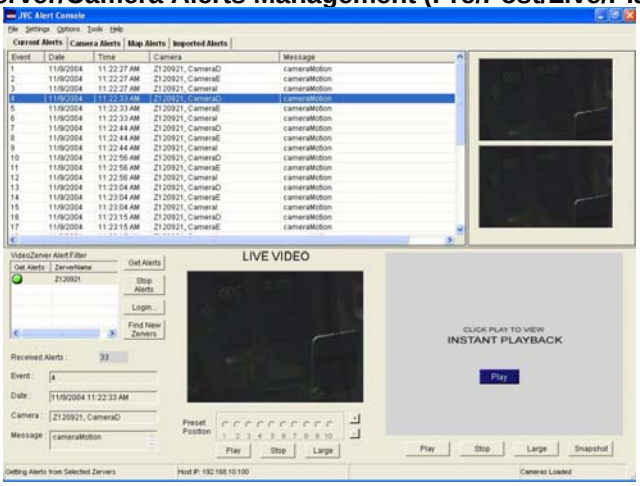
Alert Console Application (1 of 3)

Multi-Server/Camera Alerts Management (Pre/Post/Live/Playback)



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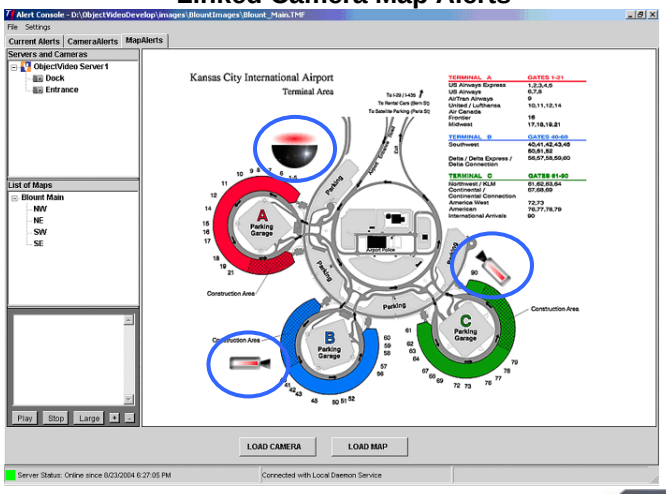
Alert Console Application (2 of 3)

Linked Camera Map Alerts



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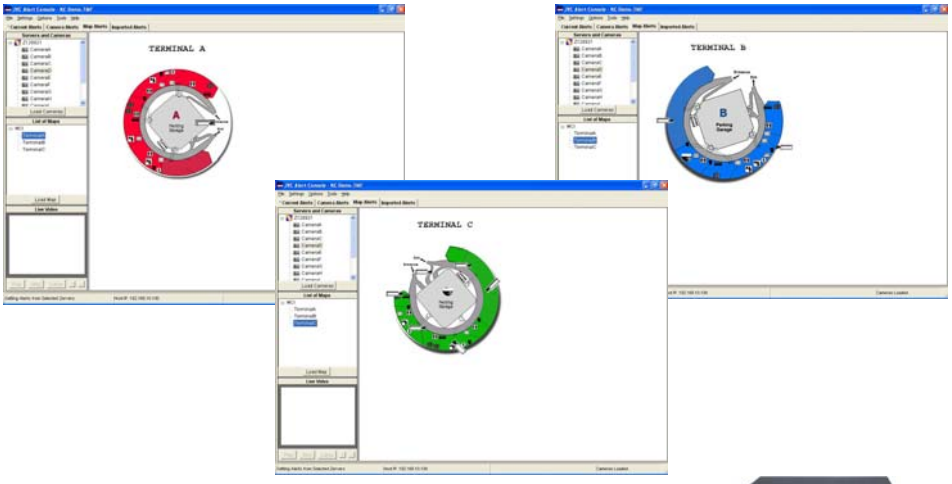
Alert Console Application (3 of 3)

Lower-Level Camera Map Alert Layers



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Wireless Connectivity Utilizing Microwave & WAP for Large Areas

5.8GHz Dedicated
Link to Head-In Unit
Up to10 Miles Away

802.11
Broadcast
From Head-In Unit

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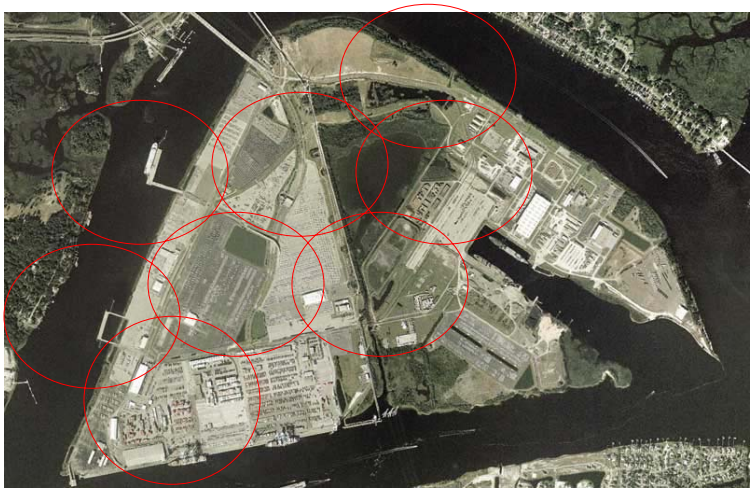
802.11 Cisco Aironet Hands-Off Video to Mobile Users by Coverage



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Implementing Wireless Networks (1 of 2)

Microwave

- Use 5.8GHz Microwave Band for Secure Wireless Video

Topology

- Each Network Camera Uses One SU (*Subscriber Unit*) to AP (*Aggregate Point*)
- You Can Have Multiple SU's to a Single AP

Networks

- PTZ Cameras Should Be Placed on Full-Duplex Networks

Vendors

- Triango and Motorola are Examples of Companies that Provide Reliable Wireless Devices

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Implementing Wireless Networks (2 of 2)

Codec

- MJPEG Should Always Be Used on Any Wireless Networks

Usage

- Patrol Cars Running Alert Console on Laptops or Tablet PCs to Automatically Receive Alerts, View Live/Recorded Video, Determine Camera Locations (Map Console), and Control Camera Functions to Assist Them To Determine Status or Urgency of Alerts.

Clients

- Requires Processing Power (CPU), Memory (RAM), High Resolution (Video Card), and Fast Connectivity Speed (e.g. 802.11a/b/g)
- Laptops
- Tablet PCs
- However, PDA's & Cell Phones are Still Not Powerful Enough for Viewing Motion Video for Surveillance

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JVC Roadmap

- New Storage Algorithms
- New Next Generation IP Cameras
- Support for Additional Network Cameras
- Advanced Power Search
- New Fail-Over and Backup Options
- Video Analysis Functionality

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Summary of VR-N100U Advantages

- Our System an Withstand Scrutiny When it Comes to Determining the Chain-of-Evidence / Data-Flow, in the Court of Law
- Complete End-to-End Digital IP Turn-Key Solution
- More Secure than Any Windows-based Software Products
- 100% API Driven Enterprise Level Solution (LAN, WAN, Internet)
- Secure (Encrypted) & Loss-Less Video Recording & Playback
- Seamless Integration with Wired/Wireless Ethernet Connections
- Network Platform, Speed, and Client Independence
- Non-Invasive Solution that is Completely IT and CCTV Friendly
- Distributed Architecture for Cameras and Storage
- Open Platform Supporting Major-Brand IP Cameras and Encoders
- Single Interface Management for All Devices and VR-N100U's
- Multi-Level User Privileges Per Camera
- 3rd Party Integration with Video Analysis (e.g. IP for Object Video)
- Supports Optional Alert Monitoring, Map Creation & CCTV Keyboards
- *****SINGLE SOURCE FOR SOLUTION AND SUPPORT*****

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Video Storage Options

- **VR-N100U**
  - **Hard Drive / RAID**
  - **NAS**
  - **Optical**
    - CD-R/RW
    - DVD-R/-RW/RAM
    - Printer for Disc ID's
  - **Tape**
    - S-DLT
    - LTO
    - AIT

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