General Solutions Description

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RECoN Pack Solutions Overview

The Anvil RECoN solution (**R**oaming **E**mergency **Co**mmunications **N**etwork) is structured around Mesh Access Points, the cornerstone of an advanced wireless network that is:

- Truly portable
- Self-configuring
- Self-healing
- Highly secure
- Standards-based
- Broadband digital

RECoN offers an integrated solution which allows for voice, video and data to be streamed across a wireless (Wi-Fi) network. For example, the Incident Commander and staff at a Mobile Command & Control Post can view images from any directions around an incident site via multiple high-resolution cameras.

In addition, once a wide area communications link (satellite, broadband, etc.) is established, access to voice, video and data streams are also made available to authorized users over a private network or the internet (for example, remote senior managers, HazMat, Fire Services, Emergency Management agencies, etc.). A high level of multi-layer security is maintained throughout the network (local and over the internet) to prevent unauthorized access to the communications. One of the key benefits of RECoN is the ability to use commercial off-the-shelf equipment (COTS) such as wireless enabled Notebooks, PDAs, and Tablets.

Also available from Anvil are personnel DVR (Digital Video Recording) modules and miniature cameras that are carried by individual Tactical Team members and can stream for recording purposes and/or be transmitted wirelessly over the BreadCrumb network.

The cameras and supporting equipment (battery pack, cameras, DVR module and wearable Breadcrumb) are installed into a Tactical Vest for true portability and hands-free video streaming. Since the Anvil DVR+ can handle up to 4 video inputs (and 2 audio inputs), a Team member can wear a miniature camera on his shoulder and carry a second camera on an extendible monopod, to allow for viewing around corners, under vehicles, etc.

For covert operations, Anvil offers the Micro DVR, a miniaturized solid-state DVR for surveillance purposes that is so small that it will fit in a shirt pocket or under a hat. Simply attach a miniature camera and start recording. Inside the Micro DVR is a powerful video processor that provides real-time recording and playback at up to 30 frames/sec.

Security of the network is provided through Fortress Security products. The Fortress product family provides the most robust, scalable and easy-to-manage line of security gateway solutions for ensuring privacy of wireless networks and mission-critical enterprise applications. These FIPS certified security products provide user privacy, access control, device and user authentication as well as data link layer integrity to guard against denial-of-service attacks.

Other wireless security products operate at the Network Layer (Layer 3) or higher. The higher the layer used to implement encryption, the more information that is broadcast freely over the airways and exposed to external attack. By building a security infrastructure that encrypts at Layer 2, Fortress products eliminate the opportunity for hackers to intercept important network data, view internal network addresses, or interrupt availability through denial-of-service attacks.

Leveraging Fortress Technologies' years of experience in developing secure network solutions for the US Government and other sensitive application environments, the Fortress system offers both device and user authentication and robust encryption methods, strong enough for the most demanding mission critical environments.

The Fortress software is included for each Mesh Access Point and is optional for client devices such as notebooks, tablets, PDAs, etc. Client devices need to be enabled with the Fortress client if the Mesh Access Point Fortress feature is enabled.

For large-scale critical incidents, the ability of participating agencies to communicate with each other in joint response (interoperability) has proven to be the single most perplexing problem. Anvil has selected the Mercury “intercom” solution to solve communications interoperability needs. Coupled with its radio over internet protocol (RoIP) / voice over internet protocol (VoIP) products, the Mercury solution can be networked to provide hundreds of nodes for larger applications and for wide area interoperability systems (WAIS).

For better wireless penetration into a building, Anvil offers portable 900MHz and 1.2GHz transmission systems.

All Anvil components are powered by rechargeable battery packs to make them truly portable and self-sustaining. Anvil also can provide custom-built battery packs to meet all needs and durations.

RECoN™ Packs

RECoN Packs are highly portable and self-contained in a rugged travel case. Available in a number of standard configurations, RECoN Packs can also be custom configured to meet specific requirements. Each RECoN Pack consists of a number of components to fulfill the functions of video streaming and recording, voice communications, remote sensing, data application access, etc.

Since RECoN Packs integrate with standard COTS equipment, most existing components such as computer Notebooks, PDAs and Tablets will integrate with the Anvil Solution set. Please contact your Anvil representative to discuss how to leverage your existing investment in your computer systems.

Comparative Chart of RECoN Packs

	Pack 1	Pack 2	Pack 3	Pack 4	Pack 5	Pack 6
Mesh Access Points	2 x SE 4 x batteries	3 x SE 6 x batteries	4 x SE 8 x batteries 4 x external antenna	4 x SE 8 x batteries 2 x external antenna	3 x SE 2 x XL 6 x batteries 4 x external antenna	4 x SE 2 x XL 8 x batteries 6 x external antenna
Cameras	2 x Axis 207w 4 x batteries 2 x battery chargers	4 x Axis 207w 8 x batteries 4 x battery chargers	4 x Axis 207w 8 x batteries 4 x battery chargers	2 x Axis 207w 4 x batteries 2 x battery chargers 1 x PTZ camera	4 x Axis 207w 8 x batteries 4 x battery chargers	4 x Axis 207w 8 x batteries 4 x battery chargers 1 x PTZ camera
Video Software		VIM Lite	VIM Lite	VIM Lite	VIM Lite	VIM Lite +
Video DVR	1 x DVR+	1 x DVR+	1 x DVR+	1 x DVR+	1 x DVR+	2 x DVR+
Handheld device (PDA)			2 x Symbol MC50	2 x Symbol MC50	4 x Symbol MC50	6 x Symbol MC50
Tablet/Notebook		1 x Itronix DuoTouch Tablet	1 x Itronix DuoTouch Tablet	1 x Itronix DuoTouch Tablet	1 x Itronix GoBook III Rugged Notebook	1 x Itronix GoBook III Rugged Notebook
Storage Case	1 x Pelican Case	1 x Pelican Case	1 x Pelican Case	1 x Pelican Case	2 x Pelican Case	2 x Pelican Case

These are standard Packs. Custom Packs are easily configured to meet client's specific requirements.

A small RECoN Pack consisting of:

- Mesh Access Points (2)
- 8db antenna (1)
- Video DVR (1)
- Fixed lens wireless camera (1)
- mini lipstick camera (1)
- spare batteries and assorted connectors and cables

all in a well-padded, soft-shell case with component organizers

A Typical Incident

Upon arrival at an incident site, the RECoN Pack (contained in a large foam-protected rugged Pelican case) is opened, providing the following components for immediate deployment:

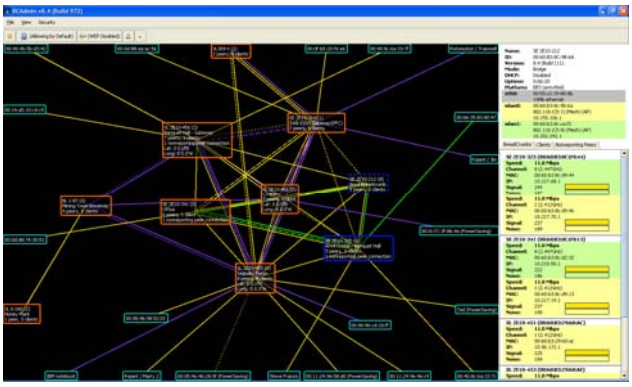
- 4 Mesh Access Points - automatic meshing, mobile wireless access points with internal hot-swappable batteries
- PTZ (remotely controllable pan, tilt, zoom capability) high-resolution camera
- 3 fixed lens cameras, wireless
- Video compression software pre-installed on a Notebook computer
- DVR+ (portable Digital Video Recorder)
- LCD Large Screen video display (will display multiple cameras simultaneously for the Command Post staff)
- Wireless Tablet computer
- Voice over IP software on a server
- External antennas
- Miscellaneous data connection cables

The Mesh Access Points are switched on and deployed around the incident site at strategic locations to provide a “Bubblenet”, i.e. full Wi-Fi coverage for all authorized users within the coverage area.

Both the “video server Notebook” and the “LCD Large Screen video display” typically are located in the Command Post (mobile vehicle or temporary site). The high-resolution cameras and the Mesh Access Points are located in strategic positions around the incident site. Deployment time is a matter of a few minutes (typically 4 to 7 minutes depending on the number of components deployed) and upon completion, the output from the cameras are available immediately for viewing on any authorized device (Notebooks, Tablets, PDAs, etc.).

Communication is automatically established via the pre-configured video-server, Mesh Access Points and cameras. As video is streamed from each camera, the images will be displayed on the large LCD screen. Each camera can be controlled by the Incident Commander (or designate) on the rugged Tablet. Video will be available for viewing by all authorized users. Should it become necessary for the Incident Commander to leave the Command Post, he/she will still have video and/or voice contact via the wireless enabled Tablet as long as he/she stays within range of the RECoN Mesh Access Points.

The Mesh Access Points Administration software allows the administrator to identify each device that connects to the networks and can selectively disable any “rogue” devices attempting to access the network.



As soon as a wide area communications link (e.g. satellite, broadband) is established, the video stream from each of the cameras will be transmitted to a secure web portal housed at the department’s EOC or other high-security facility. Utilization of this facility will help ensure security of the network for other remote users’ access. Authorized remote users will be able to view the video from their office desktops over a VPN (Virtual Private Network) connection by connecting to the EOC web host. With the appropriate security level provided, remote users will also be able to control the PTZ functions of each camera.

The video stream can also be stored on the department’s server for subsequent retrieval e.g. concurrent off-site backup, post-incident analysis, training purposes, etc.

The video application allows for multiple layers of authorization, each with a different set of permissions to view, control the cameras, or playback the video, etc. This will allow authorized users to playback any segment of the video stream while the video system continues to record and stream in live time.

An additional benefit of RECoN is that it will allow authorized users to utilize VoIP (Voice over Internet Protocol) as a voice communication capability, in the event that the standard LMR system or the cellular phone network experiences difficulties.

Please contact your Anvil representative for information on the self-aligning Satellite Dish for vehicle or ground-deployed portability.

Support for cameras

Anvil's RECoN Pack will support numerous cameras and other add-on devices for various applications, e.g. optic fibre scopes, sniper or spotter scope cameras, infra-red cameras, thermal-image cameras, etc.

Fibre Optic Scope

Spotter Scope Camera

Handheld Thermal Imaging Camera

Thermal Image Monocular Display

These components represent a few of the various items available from Anvil Technologies. Specifications and further information on these and other products are available from your Anvil representative.

RECoN System Advantages

The advantages are tangible, immediate and will enhance the safety, health and efficiency of the officers on scene. It will provide Incident Commanders with "virtual eyes", facilitating quicker and better decisions, access via the internet to critical information from remote databases, the ability to provide live video feeds securely to remote sites and instant replay of video of an event.

The Incident Commander will now have a total view of all sectors of the incident perimeter. The Incident Commander will be able to see exactly what is going on externally and internally, the latter where cameras have been deployed within a building. For example, where the Tactical Team is entering into a building from the rear and out of sight, the Incident Commander will now be able to zoom in, provided a camera had been deployed with a view of that area.

The Incident Commander will be able to monitor visually how given instructions have been followed, in other words, whether the strategy and tactics are working. Having a visual eye on the actions, he will now be able to take instant remedial action if necessary. Having "virtual eyes", the Incident Commander will be able to view how resources have been deployed to all the sectors and their effectiveness.

There are instances when the Incident Commander would like to view a particular hot site; however, that site may be unsafe to have officers present. In this instance, a camera can be deployed and controlled remotely.

In the event a Team member goes missing, the Incident Commander will be able to review the recording to identify where and when the Team member made entry. Similarly, if there is an explosion, the recording can be replayed to analyze the source or cause of the explosion and the distribution of any fragments from the explosion.

Where it becomes necessary to request industry and/or government agency assistance, the Incident Commander will be able to stream live video securely over the internet. This will significantly enhance situational awareness and provide for better, quicker advice and decisions.

In the event of a serious or escalated incident where the Police Command, Fire Chief, senior City official or off-site Subject Matter Experts needs to be involved, live video can be streamed securely over the internet or sent to a cell phone that has video capability.

RECoN Pack Benefits Summary

- Immediate, beneficial impact on the safety, health and effectiveness of Police Department operations by reducing the potential for serious injuries or fatalities of officers
- Provides a very valuable tool to Incident Commanders utilizing the Incident Management System (IMS) at large-scale, hazardous events
- Enhanced situational awareness by allowing the Incident Commander to view exactly what is occurring around the entire incident scene from the Command Post
- Effective tool for Incident Commanders to assess whether strategy and tactics are progressing towards mitigation of the incident
- Allows Incident Commanders to assess situation status more quickly by seeing events and reducing the need to request information from Sector Officers
- Incident Commanders will be able to react immediately to negative situations
- Sector Officers will be able to accurately update Incident Commanders by allowing the Incident Commander to view results or problems occurring with strategy and tactics as deployed
- Quicker, better decisions made by immediate access to timely, meaningful information by monitoring Sectors and progress of operations
- Facilitates better use and tracking of police resources such as personnel deployment, apparatus placement, etc.
- Allows remote monitoring of a situation when too dangerous for personnel to be present
- Allows instant replay to review critical sudden events that occurred to assess cause, loss and concern for wellbeing of officers; and
- Secure, remote (not on scene) visual access for real-time incident information for appropriate senior police officers, government or industry expert authorities, via a VPN to personal computers over long distances
- Provides a visual record of events for report preparation, forensic investigation, training and SOP (Standard Operational Procedures) review.

Online Training

Online learning or "e-learning" *(electronic learning)* is an innovative method of learning whereby some of the interaction takes place via the internet. Students benefit from the self-paced approach regardless of geographic location. Therefore, courses are available wherever internet is accessible. However, most online training or "e-learning" programs can take hours to complete which rapidly deteriorate the learner's interest. Constantly having to scroll to read too much information; poorly planned interface that does not interact with the learner; inadequately designed learning management systems that fail to track learners results are some examples of e-learning systems that exist.

Anvil's partner, Respond Solution's innovative creation of learning centres each learner's needs in on-line learning environment. This allows students to get fully involved; participate in simulations and tests like never before, and get instantaneous feedback on his/her progress. Students can refresh and update skills when required, without waiting for a full course to be scheduled. This sophisticated system coupled with Respond-Solution's philosophy is designed with the learner and client in mind.

Our approach to different learning styles can be accommodated by on-line learning. We offer generic courses as well as the capability of customizing any curriculum that a client may need to simultaneously access hundreds or even thousands of employee's within an organization world wide. Our instantaneous database makes tracking of staff's progress a breeze by providing real time administrative data.

Respond Solution provides a cost-effective approach for employers as time management is improved and controlled with e-learning. Our interactive images, text and video provide a valuable education to suit any organizations needs.

Summary:

- New user friendly inter-phase design
- Modular & Lesson "easy to follow" curriculum format
- New interactive real time video scenario format
- Ability to insert client specific curriculum automatically
- Real time reporting and tracking for users and client coordinators
- Automatic email reminders on user due dates
- Automatic email reminders on forgotten user name and/or passwords
- SSL 128 bit encryption

Anvil Technologies

Anvil represents the coming together of a focused group of senior industry consultants. Incorporated in 2002, Anvil's senior partners individually bring 20+ years of experience in the application of technology to business solutions.

Anvil's team contains ex-Police Officers and industry-specific experts with wide knowledge in Public Safety, Healthcare, Transportation, etc. Partnering with a number of "best-in-class" companies, Anvil has successfully integrated a number of COTS (Commercial Off-The-Shelf) products into a series of solutions. Use of COTS products offers significant opportunities for reduced development time, faster insertion of new technology, and lower life cycle costs. Even though each of the products Anvil provides is standalone and fully functional, once integrated by Anvil's innovative staff they synergistically become an unparalleled foundation for increased productivity and safety.

Anvil Technologies has integrated a number of solutions to allow Emergency Management Services and other government agencies access to newer technologies, to improve inter-agency coordination, communication and operability. We offer our clients an invaluable combination of modern technology and emergency and risk management consulting. Our experts cover various related disciplines allowing Anvil to bring world-class knowledge and field experience to your side, including the ability to integrate legacy systems and technology with our new solutions.

Anvil's unique combination of expertise and technology in a single firm provides Public Safety personnel with comprehensive end-to-end security solutions.

In summary, Anvil's team will develop the appropriate solution to meet your needs, integrate the right components, deploy, test and document the solution and provide the hands-on training (or train your trainers).

Anvil is an authorized reseller to the U.S. Department of Defense.