V5 SYSTEMS

Outdoor Portable Power, Computing and Security
Independent from the Power Grid

The Industrial Internet will be built on application software and hardware

V5 self-power platform integrates technology partner software, hardware and sensors driving opportunity and revenue as we build the industrial internet together

Technology
Partners

DELLEMC   (intel)   vmware

ARROW   AXIS
COMMUNICATIONS

Introducing V5 Systems

Self-Powered Industrial IoT Computing and Security Solutions
Wireless Interoperating with Core & Cloud Applications

2016
Platinum Winner
"Connect What Matters" IoT Contest

SIA NEW PRODUCT SHOWCASE WINNER
Video Surveillance Hardware and Accessories
V5 Systems
2016 ISC WEST

SIA NEW PRODUCT SHOWCASE WINNER
Emergency Communications /Mass Notification Systems
V5 Systems
2017 ISC WEST

SIA NEW PRODUCT SHOWCASE WINNER
Video Surveillance Hardware and Accessories
V5 Systems
2017 ISC WEST

SAFE SKIES
Safe Skies Tested & Approved 2016

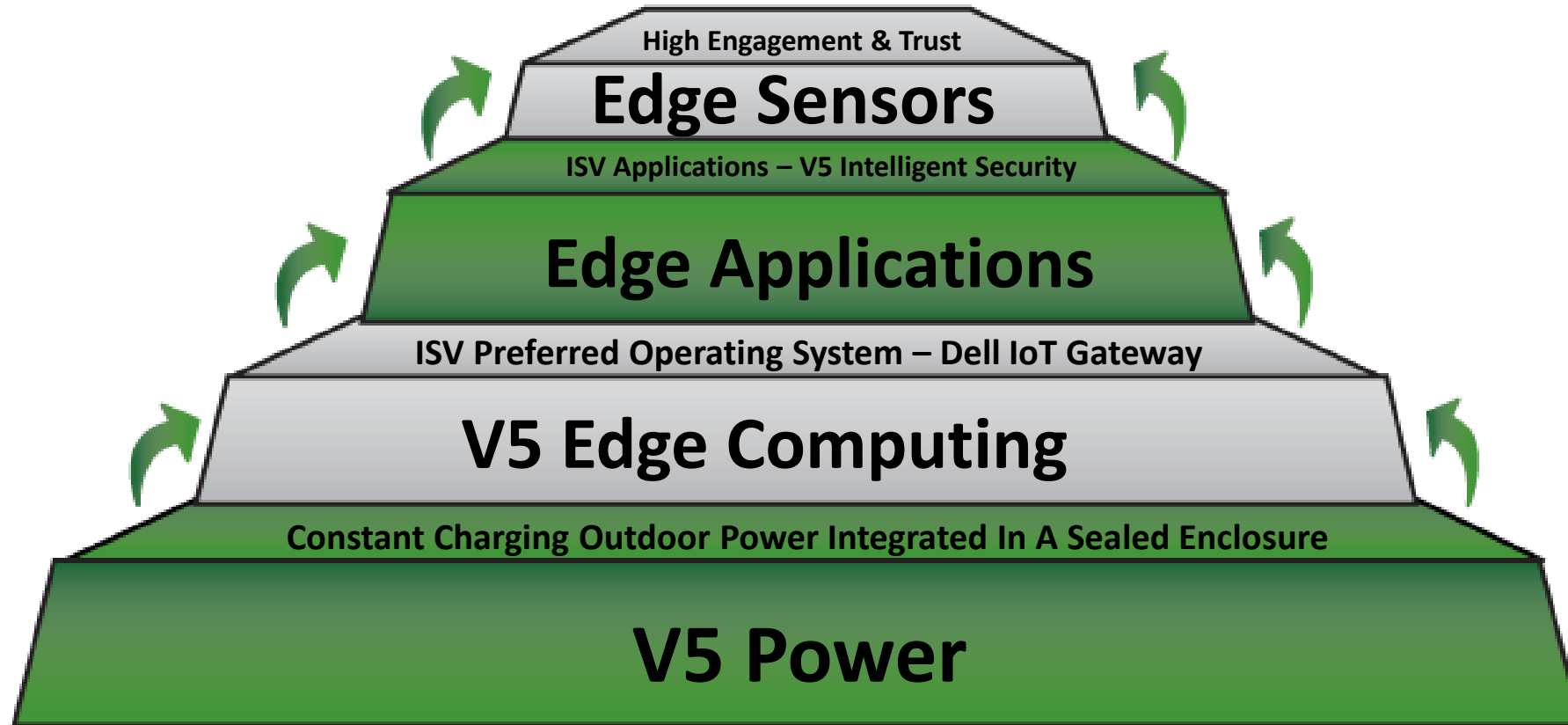Smart City 2016
Best Smart IoT Security Winner

Smart City 2016
Best Smart City Winner

Outdoor Industrial IoT Challenges

1 Planning, permitting and construction is time consuming

2 Too costly or difficult to tap into power and connectivity

3 IT/OT challenges connecting multiple nodes

4 Processing data that matters in real time - at the edge

V5 Technology Layers

High Engagement & Trust

Edge Sensors

ISV Applications – V5 Intelligent Security

Edge Applications

ISV Preferred Operating System – Dell IoT Gateway

V5 Edge Computing

Constant Charging Outdoor Power Integrated In A Sealed Enclosure

V5 Power

V5 Portable Building Blocks for
Self-Powered Outdoor Applications

PPU Use Case

UCLA – Student Housing

Problem Statements:
- Student Housing Vulnerabilities
- Trenching Power and Communications not viable and too expensive
- 250 locations

Components To Solve Problem:
- V5 Portable Power + V5 Solar Panels
- UCLA owned Axis video camera + Ubiquiti RF transmitter

Expected ROI:
- Student safety protects UCLA brand

Less than 30 days from 1st conversation to UCLA ordering PPUs from Dell

Self-Powered Edge Systems

V5 portable power, security and computing platform for outdoor applications

Independent of the power grid and wired networks

Portable Power
- Perpetual Outdoor Power for 3rd party hardware products

Portable Edge Computing
- Self Powered Server for outdoor deployments of 3rd party software, hardware and sensors

Portable Camera Adaptive Platform
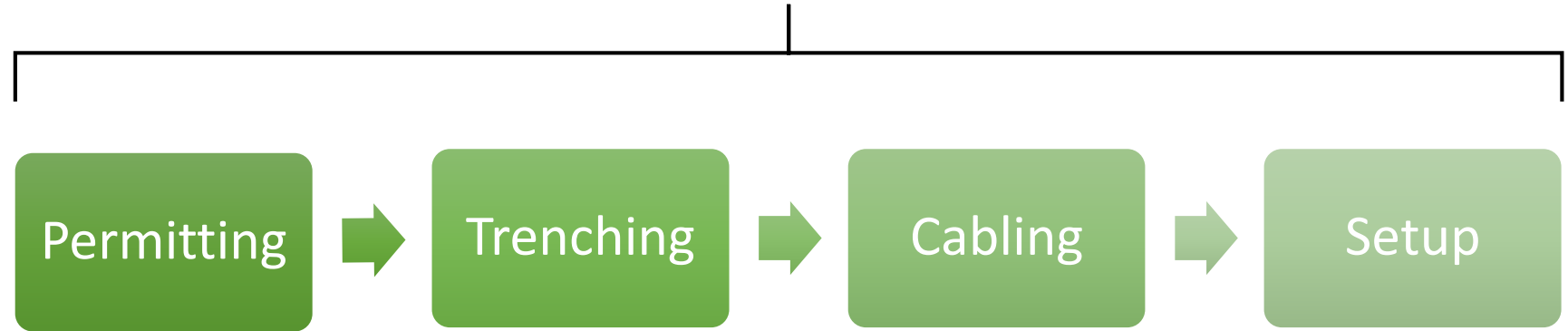- Self Powered [3rd party] video cameras and wireless communications

Portable Security Units
- Self Powered Integrated video surveillance, acoustic and chemical detection
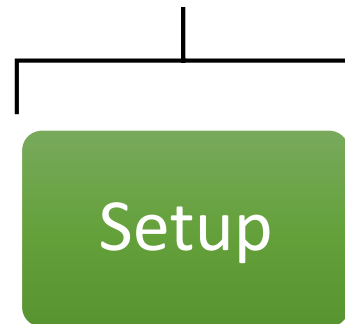
Unprecedented Time to Value

Trenching requires Weeks to Months to Years

Traditional
Power & Connectivity

| Permitting | → | Trenching | → | Cabling | → | Setup |

30-60 Minutes

Setup

Partner Opportunities

Rapid Deployment

- Turnkey Solution
- Fewer Resources Needed
- Effortless Setup

Expand Your Business to the Outdoors

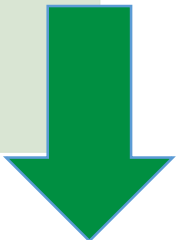- Large "greenfield opportunity" given the new and unique self-powered outdoor security solutions market

Rapid ROI

No Trenching
2 Year Warranty

Extremely Few Competitors

- Highly differentiated product

V5 Portable Power

What Can You Implement With Perpetual Power Independent of the Power Grid?

Edge Power – V5 PPU

Delivers perpetual power [5v, 12v, 24v, 48v]
Integrated Multiple Battery Subsystems
Power Management/Switching
4 hours, on average, of sunlight on V5 Solar Panels

PPU: 1.5Kw | DPPU 3Kw

IP67 Ruggedized Enclosure

Compact Form Factor

Less than 25 lbs.

Portable Edge Computing

Self Powered Edge Computing
Software Applications deployed outdoors
Independent from the Power Grid and Wired Networks

V5 Edge Computing – V5 PECU

Applications at the edge

IoT gateways, Linux or Windows based 'Outdoor Self-Powered Server'

Modular design to integrate 3rd party software applications validated on IoT Gateways

Modular design to integrate 3rd party hardware devices

Wireless Communications via WiFi, Cellular and Long Range RF

Real time processing of relevant information via edge computing

Advanced Computing Platforms for Industrial IoT Applications
"Bring your own IP and SI" integrated 3rd party hardware, sensors and software

PECU Use Case

Wunderlich-Malec & OSIsoft applications – Remote Station Monitoring

Problem Statement:
- WM VIP assists industrial customers to digitize the world around them; automating each component to deliver a world-class maintenance tool
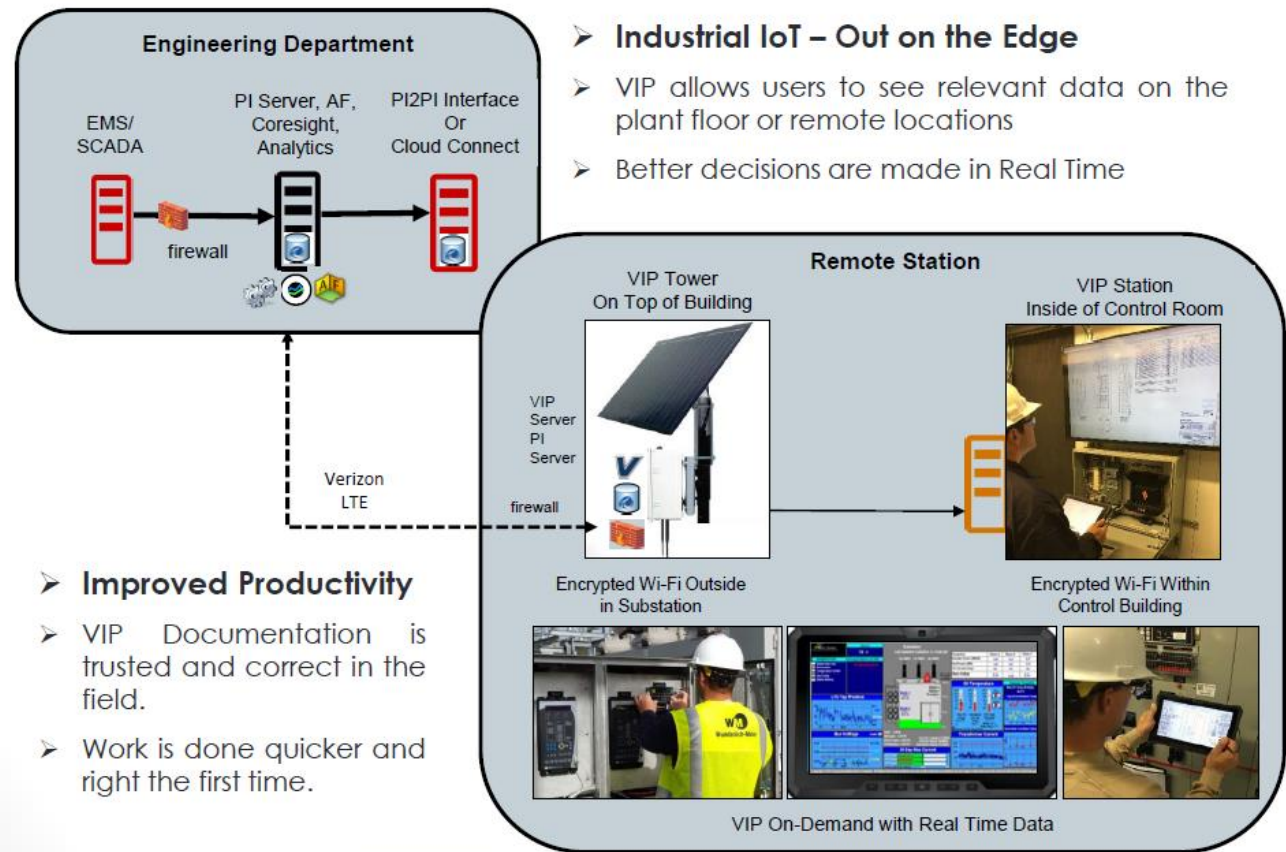
Components To Solve Problem:
- Master Packager: Arrow
- WM VIP – Applications & Integration
- OSIsoft – Analytics / Historian
- IoT Gateway - HPE & Dell
- V5 – Self-Powered Server [PECU]

ROI:
- Displays relevant documentation, live data and other resources about the equipment and components in their plant[s]

CENTRALIZED SOLUTION

Engineering Department

EMS/ SCADA — firewall — PI Server, AF, Coresight, Analytics — PI2PI Interface Or Cloud Connect

➢ **Industrial IoT – Out on the Edge**
➢ VIP allows users to see relevant data on the plant floor or remote locations
➢ Better decisions are made in Real Time

Verizon LTE

Remote Station

VIP Tower On Top of Building — VIP Server PI Server — firewall

VIP Station Inside of Control Room

Encrypted Wi-Fi Outside in Substation

Encrypted Wi-Fi Within Control Building

➢ **Improved Productivity**
➢ VIP Documentation is trusted and correct in the field.
➢ Work is done quicker and right the first time.

VIP On-Demand with Real Time Data

PECU Use Case

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REMOTE CONNECTION

VIP Tower Solution
➢ Emergency Power Back-Up
➢ Bullet Resistant Solar Panel
➢ 100% Power Back Up for VIP Tower Systems
➢ DC Battery Back Up
➢ 48+ Hour Operations for VIP System – if no power input

Dell IoT Gateway
➢ Encrypted WiFi Communications
➢ Cellular 4G / LTE
➢ Verizon / AT&T Capable

Physical Security Solutions

V5 Camera Adaptive Platform [CAP]

V5 Portable Security Unit [PSU]

V5 Camera Adaptive Platform

Integrate 3rd Party Video Cameras onto V5 CAP units for deployment in outdoor environments

Designed to work with customers backend VMS applications and communication ports

Compatible with PoE, 5Volts, 12Volts and 24Volts camera power requirements

Integrated cellular and WiFi support
Add Wireless Communications – RF or other systems

Camera Adaptive Platform

Outdoor deployments of
V5 Portable Power,
Computing, Wireless Communications
Partner video cameras
independent of the power grid & wired networks
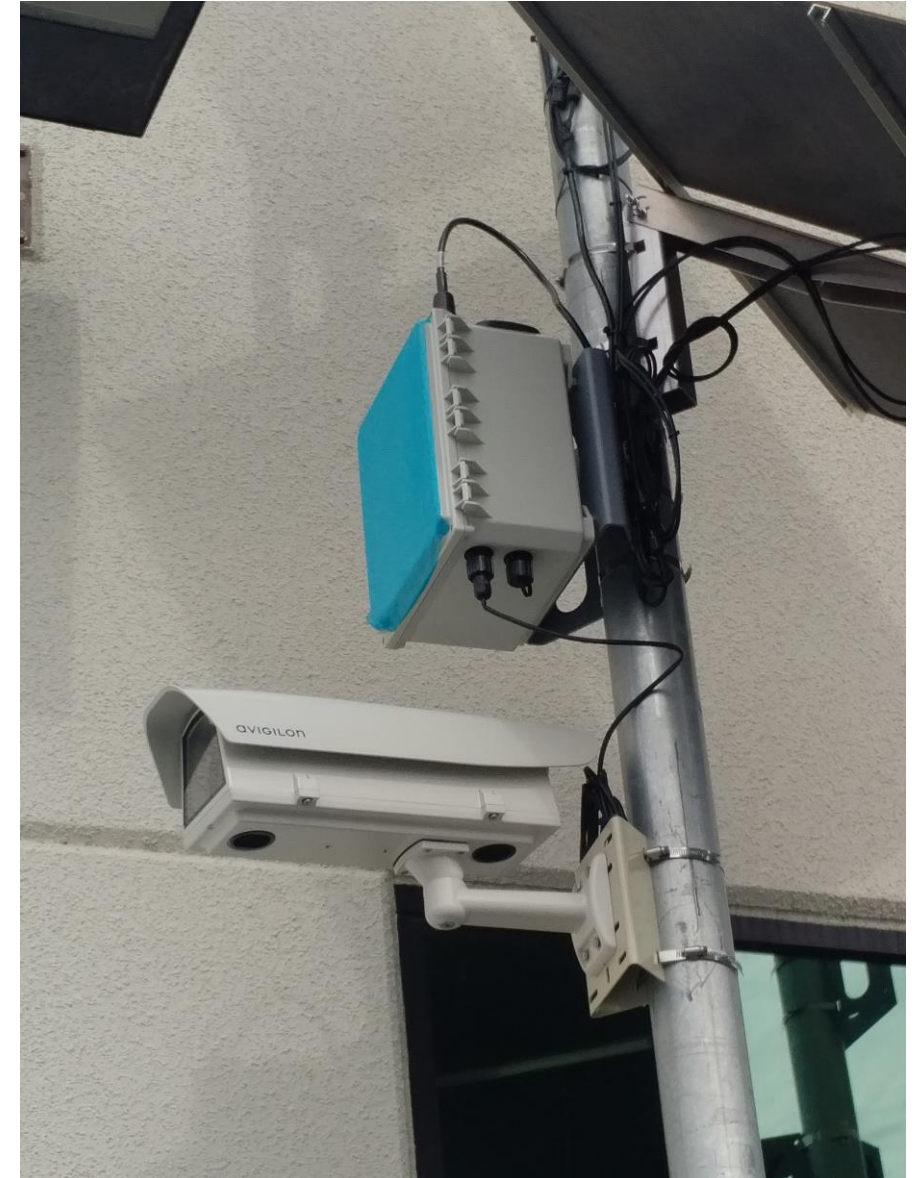
Edge Security – V5 PSU

V5 Portable Security Unit

PSU
(Portable Security Unit)

PSU-Streaming

Acoustic Sensor –
Gunshot Detection

PSU-PTZ
(Pan, Tilt Zoom)

PSU-LPR
(License Plate Reader)
V5 Predictive AI

Lidar
V5 Predictive AI

15FKL
CALIFORNIA

- Turnkey, all-in-one self contained system
- Proprietary power via V5 power management system & V5 solar panels
- Video storage – Up to 1TB Intel Based on board storage and/or back end server
- Ruggedized enclosure with industrial grade components
- Less than 2 ft. long and less than 25 lbs.
- Configure & Install in under 30 minutes

Instant Notification – Directly to First Responders Cell or Mobile Devices and email

Acoustic Tracking

Outdoor Self-Powered Gunshot Location & Tracking

Gunshot Location
Standalone or integrated with Video

➤ The ability to detect acoustic events of interest from ambient environmental audio using pre-trained Artificial Intelligence methodologies

➤ Current event detection for gunshots and fireworks

➤ Future event detection for spray cans to mitigate graffiti damage

➤ Trainable to detect any sound signature

➤ Provides a direction to the source of an event of interest if detected by one unit

➤ Provides a 2D or 3D pinpoint of the location of the event of interest, if two or more units detect the same event
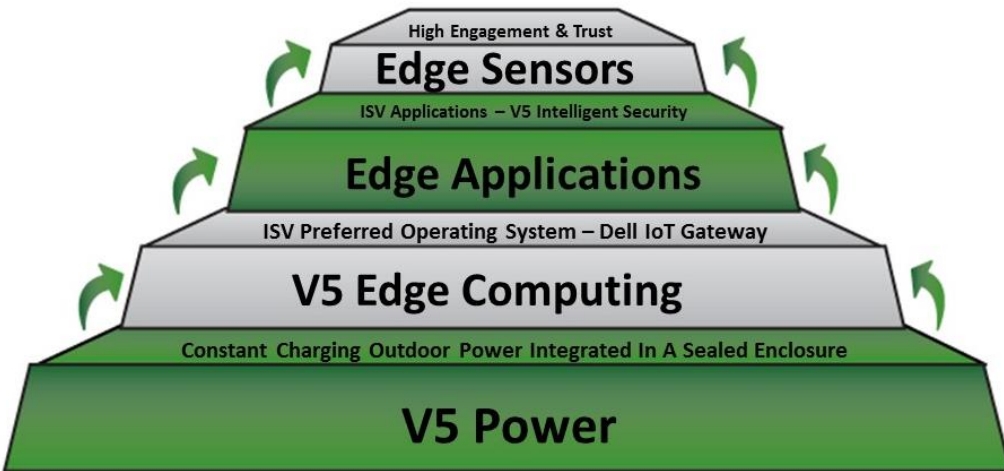
V5 Edge
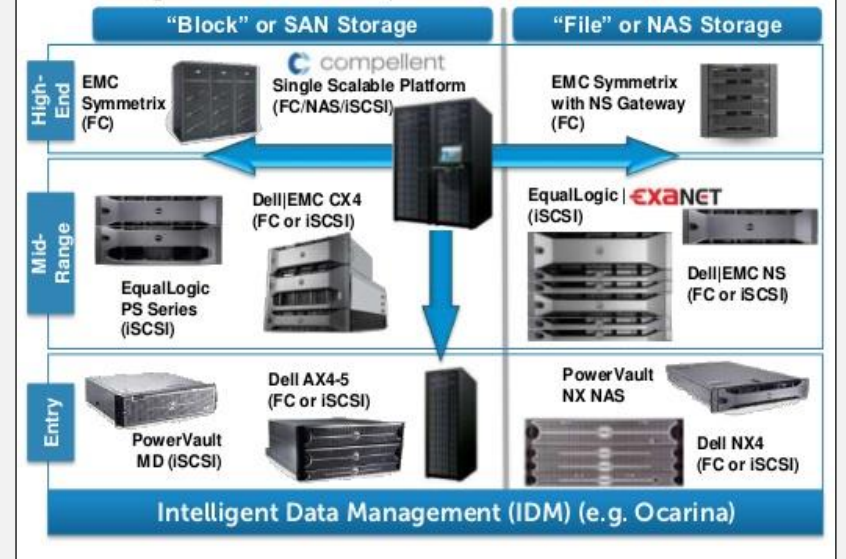# Interoperate with Core - Cloud

Outdoor Self-Powered Edge

Core - Cloud

Cellular
WiFi
RF

High Engagement & Trust
Edge Sensors
ISV Applications – V5 Intelligent Security
Edge Applications
ISV Preferred Operating System – Dell IoT Gateway
V5 Edge Computing
Constant Charging Outdoor Power Integrated In A Sealed Enclosure
V5 Power

Dell PowerEdge FX2 Servers
Dell EMC Storage Solutions

Use case examples

V5 Portable Security Unit [PSU]
V5 Portable Edge Computing Unit [PECU]

PSU Use Case

City Of Hayward/PD– Video Security In and Around City Hall

Problem Statements:
- Theft and drug crime in and around city hall due to open areas and it's close proximity to the main rail transportation for the bay area (BART)
- No power infrastructure where crime activity was happening

Components To Solve Problem:
- V5 Systems PSU = Solar-Powered Portable Security Units

Expected ROI:
- Trenching fees around $750K per mile
- 60% drop in calls for crime

Google Map View Of Deployed V5 Units
On V5 Systems User Interface

PSU Use Case

San Jose State University – Situational Awareness And Gunshot Detection

Problem Statements:
- Security in areas around campuses without power access
- Gunshot detection for campus

Components To Solve Problem:
- V5 Systems PSU = Solar-Powered Portable Security Units
- V5 Systems Gunshot Sensor = Sensor integrated on V5 Systems PECU Units

Expected ROI:
- Trenching fees around $750K per mile
- $250K per sq. mile per year for traditional gunshot monitoring

PSU Use Case

New Bedford Harbor - Palmers Lighthouse & Dockside

Problem Statement:
- Vessel ID for "Legal" Docking activity
- ID Chemical/Radiation Threats

Components To Solve Problem:
- Systems Integrator: INEX Advisors
- Axis Communications IP Camera = Vessel ID
- GE Current IP = Chemical/Radiation station
- V5 Systems Portable Security Unit with Analytics [captures the bows of boats for ID attestation]
- V5 PECU; V5 Power Units

ROI:
- $250K in Docking Fees and Fines collected per year

Dell FY2017 Social Responsibility Report – page 15
http://i.dell.com/sites/doccontent/corporate/corp-comm/en/Documents/fy17-cr-report.pdf

PECU Use Case

Salt Creek Vineyard - Micro Climate Weather Stations

Problem Statements:

- Smart Irrigation in Viticulture
- Designing for Predictive Analytics for higher Yield

Components To Solve Problem:

- Systems Integrator: INEX Advisors
- Davis Instruments IP = Weather Sensors and Instrumentation
  - full stack exfil MQTT for incorporation into different dashboards
- V5 Systems PECU = Solar-powered Dell Gateway

Expected ROI:

- Improve yield and quality of production, especially in red varietals subject to more risk
- 30% Reduction in Water Usage

Thank you!

www.v5systems.us