Impresa 4.0

Soluzioni per la digitalizzazione del settore industriale

Smart Logistic & Asset Tracking

Masi Matteo
Sales Specialist – Industry Digitization / Industry 4.0

Global Manufacturing Challenges Ahead…

- Increasing Complexity
- Increasing Cost Pressure
- Diverging Markets
- Production Flexibility
- Value Chain Insight
- Product Servitisation
- Changing Customer Behaviors
- Competitive Landscape

Changing Trends Are Driving Changing Priorities

Imagine the Possibilities…

- Connected
- Secure
- Data driven
- Efficient

Da Industria 4.0 a Impresa 4.0

#DIGITALIANI

Industria 4.0

Focus su linea di produzione, Fabbrica e Macchine

Impresa 4.0

Focus sul valore del digitale al servizio dell' Impresa Manifatturiera Italiana

https://www.internet4things.it/tag/digitaliani/

La via Italiana all'Impresa 4.0


Ministero dello Sviluppo Economico
PIANO NAZIONALE
INDUSTRIA 4.0

Agevolazioni fiscali

WARRANT GROUP®

La matrice Spese | Agevolazioni

ATTIVITA' DI RICERCA E SVILUPPO
Approccio integrato Warrant Group

	CREDITO RICERCA E SVILUPPO	PATENT BOX	CREDITO INVESTIMENTI SUD	SUPER / IPER AMMORTAMENTI	CREDITO PERSONALE ALTAMENTE QUALIFICATO	POR FESR	HORIZON 2020	START UP INNOVATIVE	PMI INNOVATIVE
Oggetto sociale *finalizzato all'**innovazione***								✓	✓
*Svolgimento attività di **ricerca e sviluppo***	✓	✓			✓	✓	✓	✓	✓
Soglie quantitative *all'attività di R&S svolta*	✓	✓				✓		✓	✓
*Presenza di **personale altamente qualificato***	✓				✓	✓		✓	✓
*Presenza di **personale qualificato***	✓					✓			
*Investimenti in **macchinari,** strumenti e attrezzature*	✓		✓	✓					
Titolarità** di diritti sull'**IP	✓	✓						✓	✓
Reddito** di sfruttamento di **IP		✓							

Tipologia di spesa di Ricerca e Sviluppo	**PREMIO FINO AL 31.12.2016**	**PREMIO DAL 1.1.2017**
Personale altamente qualificato impiegato in attività di ricerca e sviluppo.	50%	50%
Spese relative a contratti di ricerca stipulati con università, enti di ricerca e organismi equiparati, e con altre imprese, comprese le start-up innovative; Servizi di ricerca e consulenze acquisiti da professionisti autonomi assimilati ai contratti di ricerca.	50%	50%
Quote di ammortamento delle spese di acquisizione o utilizzazione di strumenti e attrezzature di laboratorio.	25%	**50%**
Competenze tecniche (comprese le spese relative a personale non altamente qualificato) e privative industriali.	25%	**50%**

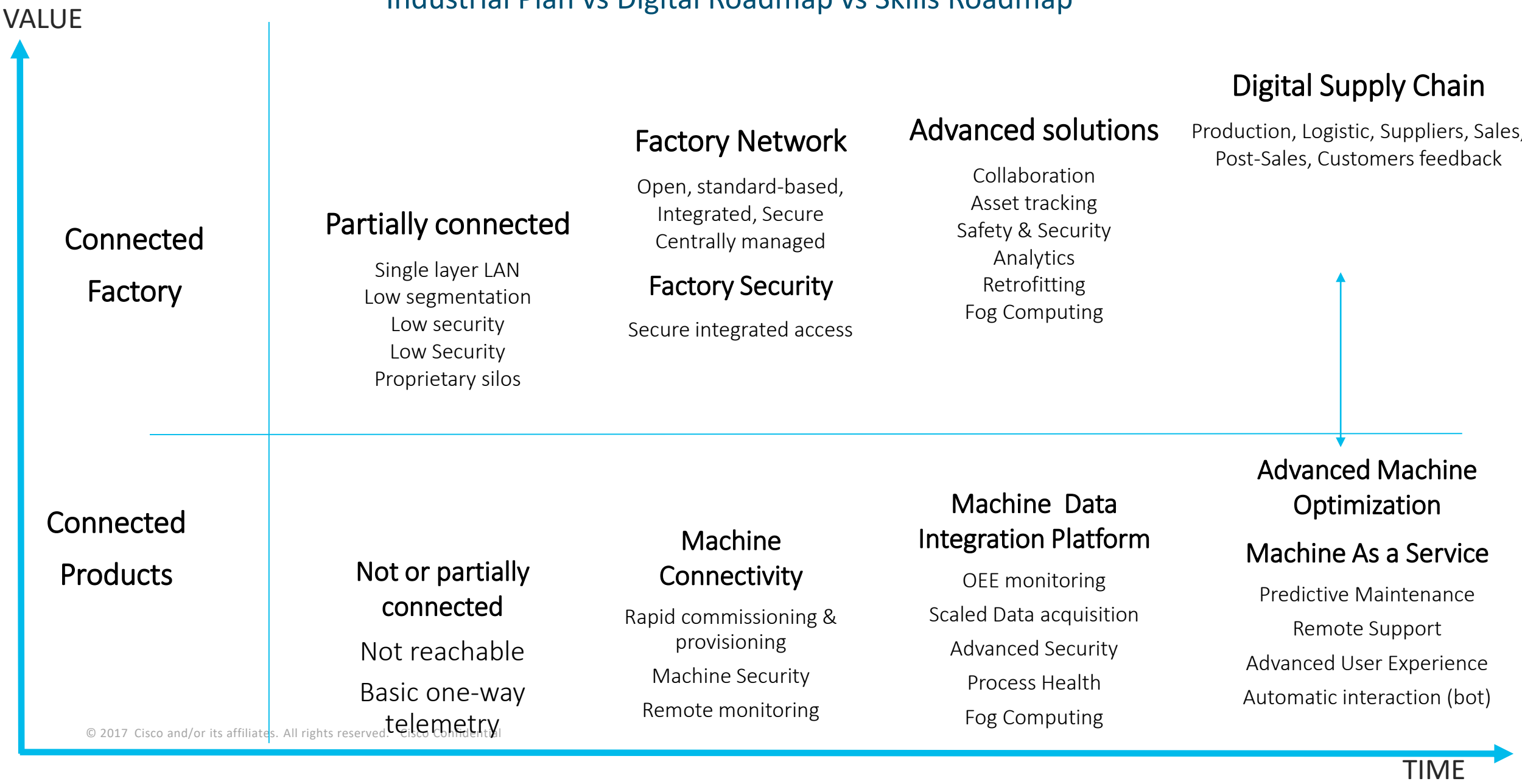
Obstacles implementing Industry 4.0 in their Organization

- Lack of strategy, a roadmap
- Lack of key talent & capabilities
- Lack of strategy to collect, manage, secure data
- Lack of understanding the ‘What’ in order to deploy the “How”
- The RISK of Doing Nothing

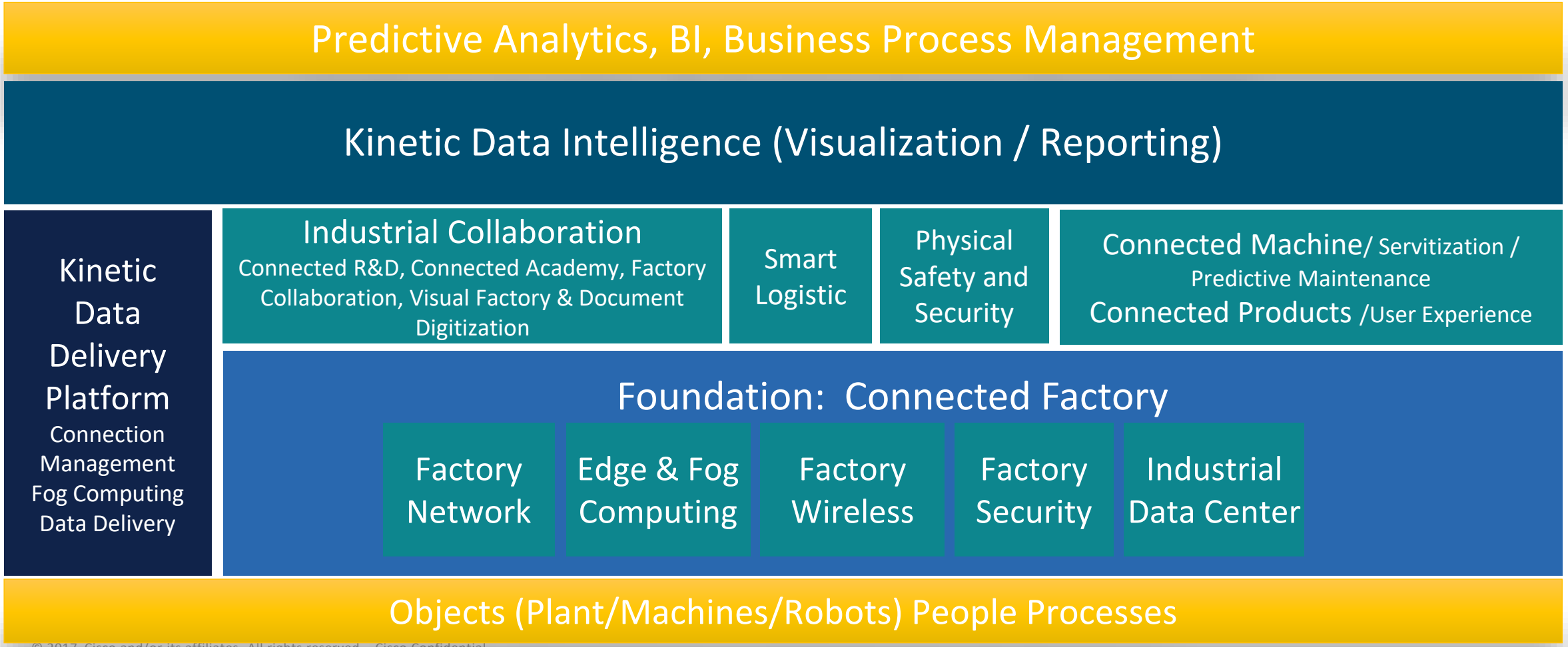
Cisco as a leader of Industry4.0 ecosystem

Digital Manufacturing Roadmap guideline

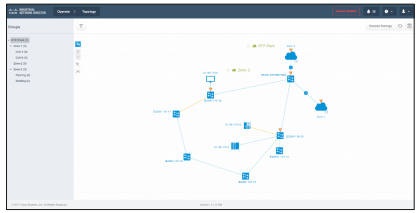
Industrial Plan vs Digital Roadmap vs Skills Roadmap



Industry4.0 Infrastructure and Solutions



Connected Factory (CPwE Validated Design Guide)



Enterprise Zone
Levels 4 and 5

Industrial IDMZ (iDMZ)

Level 3
Site Operations
(Control Room)

Manufacturing Zone
Level 3
Distribution and Core

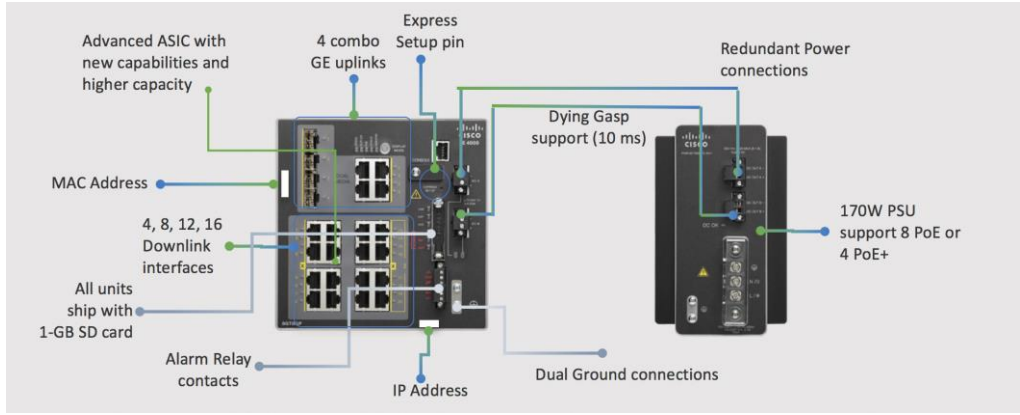
Cell/Area Zone
Levels 0–2

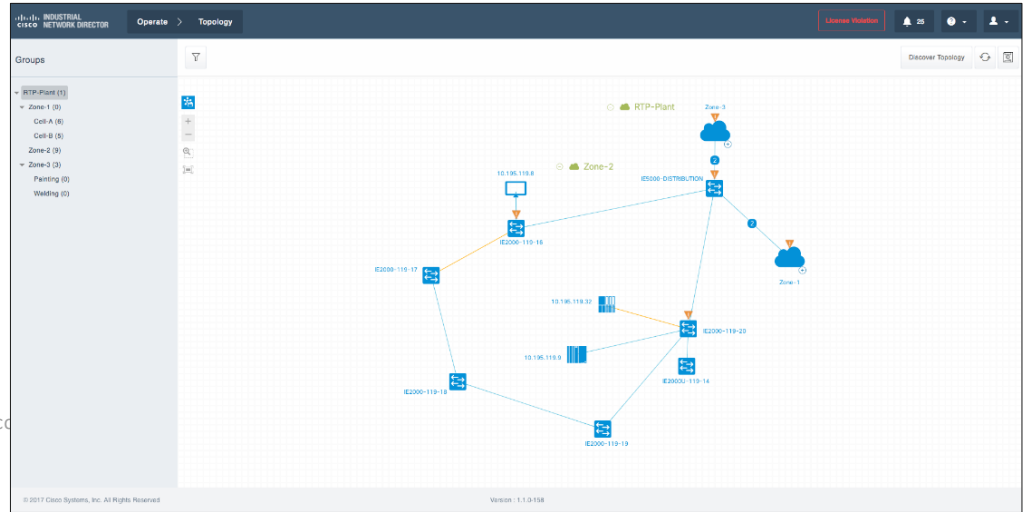
Cisco CPwE

Connected Factory

https://cisco.app.box.com/s/holetxzm5b1suh2s28ijqcbf31gznir6

- 1 Network: Open, Standard-based, Secure, Scalable
- Enterprise & Industrial Protocols
- Network-As-A-Sensor built-in security
- Integrates Manufacturing Systems + Business networks
- Enables real time visibility to business applications
- Reduce downtime
- Improved OEE and productivity
- Increase safety





New

- TSN (Time Sensitive Networks) support
- Industrial Network Director

Marcegaglia Connected Factory

Transforming plant ops at Marcegaglia

https://youtu.be/DnNeJmHcC58)

Challenge

- Improve efficiency and uptime in all their factories
- Reduce production costs; drive productivity
- Guarantee highest levels of safety

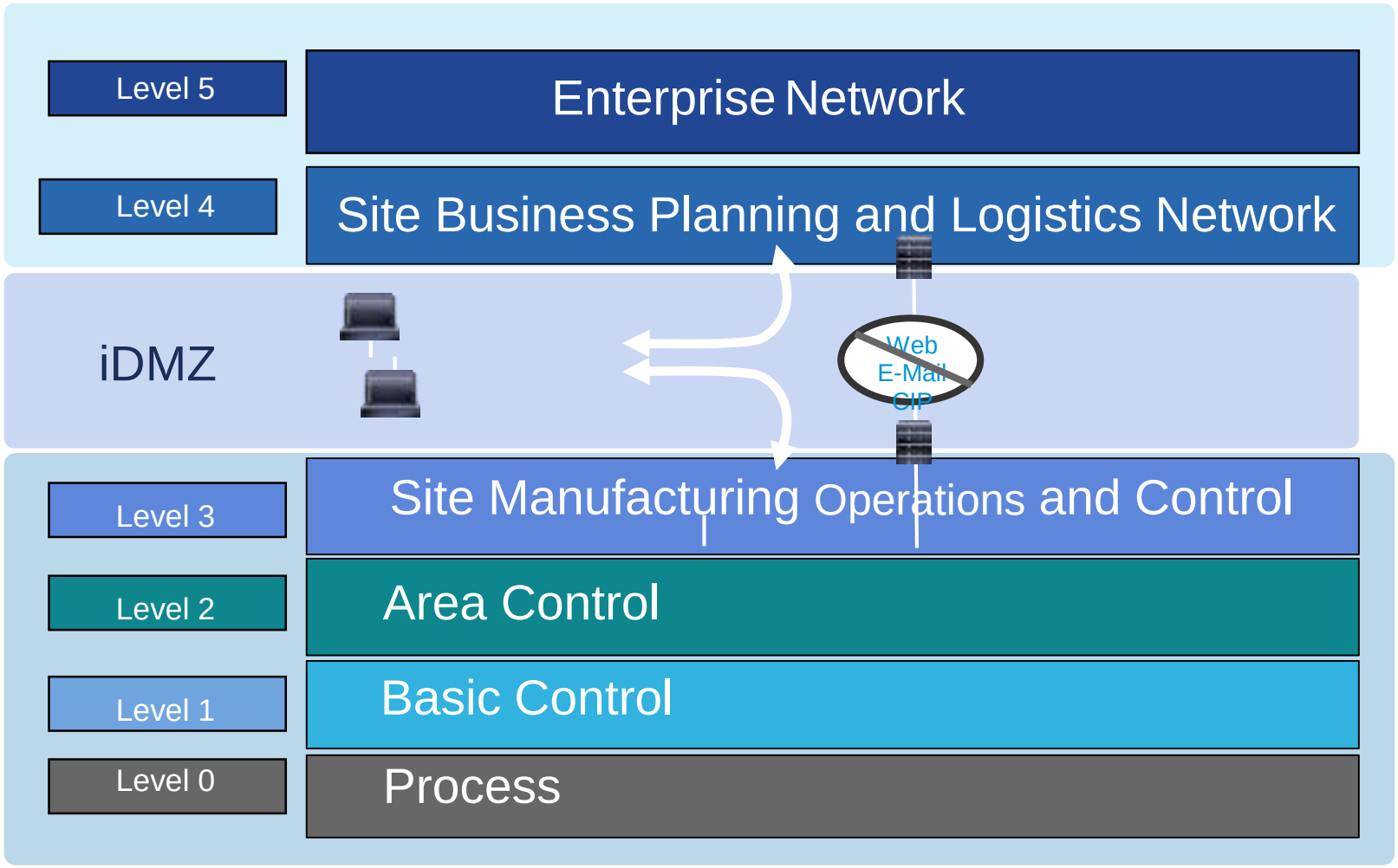
Solution

Connected Factory Network and Factory Wireless—with extended teams of IT and OT working together

Results

- Reduced to zero production errors
- Improved physical safety for personnel
- Improved IT security for connected systems and devices

Factory Security



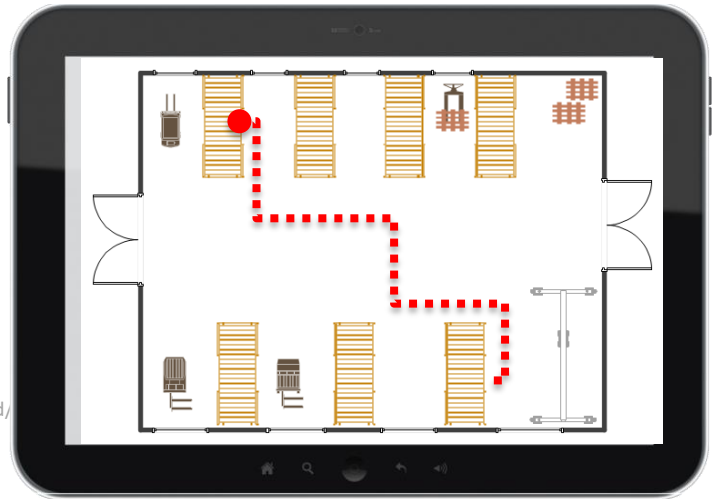
- Business continuity, availability, integrity
- Quick crisis management and response
- Reduce downtime
- New business models: Remote maintenance + Remote collaboration
- Granular security policies
- Integration with Network-As-Sensor framework
- 3 steps security
  - 1: Secured Connectivity
  - 2: Secured Visibility and Control
  - 3: Converged Security and Depth

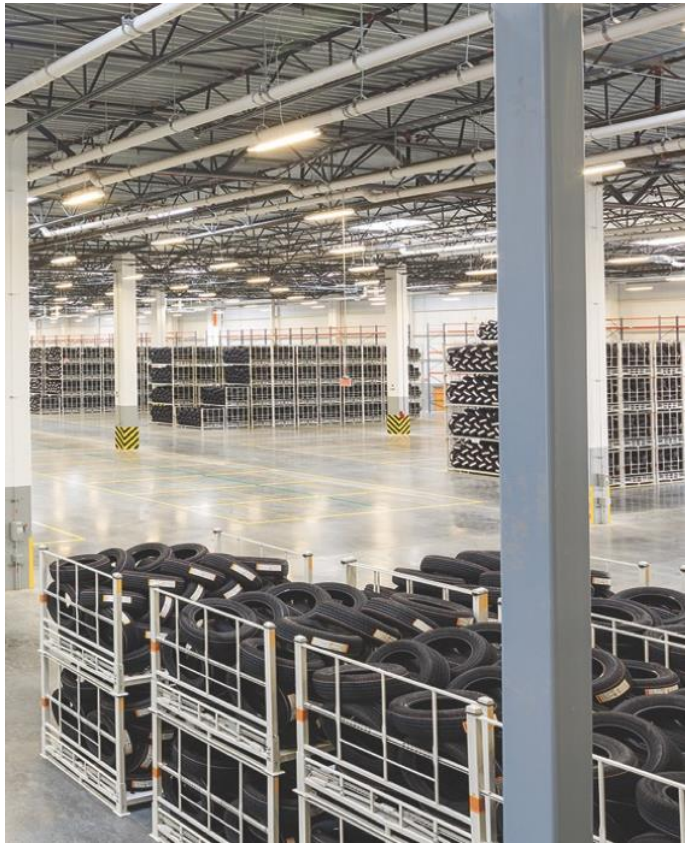
Marcegaglia Factory Security

http://cs.co/Industry40-Cisco-MarcegagliaFactorySecurity

Smart Logistic, Asset tracking

- Real time Equipment and Asset visibility, location, condition
- Track supplies in transit
- Inventory accuracy
- Improved equipment utilization
- Real time push notification
- Correlate location of asset and operator to minimize down time

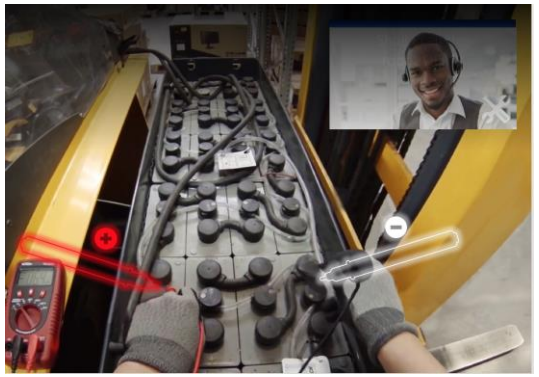




Industry Collaboration

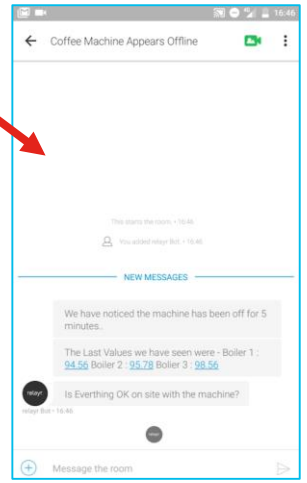
Telepresence

Remote Support



Smart Glasses and Helmets

Spark Board: Connected R&D



Spark:

Human-Machine Interaction with bots

Manufacturing Collaboration featuring Cisco Spark

- A single platform for viewing relevant data
- Alerts across the value chain
- Identify and fix broken part
- Full history captured
- Augmented reality

Industrial Collaboration to Shorten Downtime
https://www.youtube.com/watch?v=hlvEjABsbZ8

Predictive Maintenance with Spark integration
https://www.youtube.com/watch?v=hlvEjABsbZ8

Connected Products & Machines

- New revenue stream thanks to new services
  - Predictive maintenance, zero downtime, machine running, Data Analytics, Remote support
- Predictive Maintenance
- Machine-As-A-Service
- Time to market, Innovation, quality assurance
- Fog/Edge computing
- Machine Retrofit
- Mac ing

Industrial Asset

End Point Connectivity

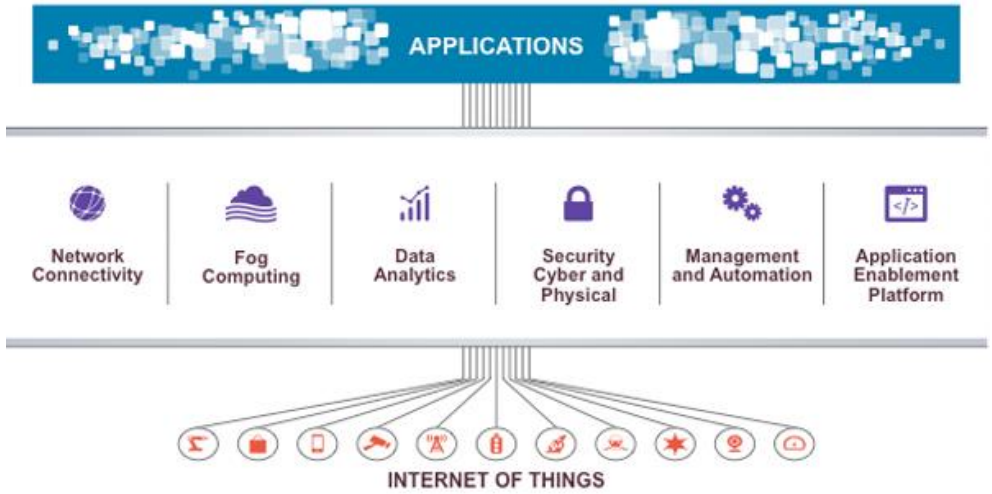
Industrial Networking

Machine Learning

EDGE COMPUTING

Fog Computing

- An architecture design combining compute, storage, control, management, and inter-communication of edge devices and clients
  - Extension of the cloud down to the things
- Why do we need another concept?
  - It refers to a unique problem domain
  - Fog addresses network issues of latency, bandwidth and operational issues of autonomous operation, in-flow data analysis, and management overload



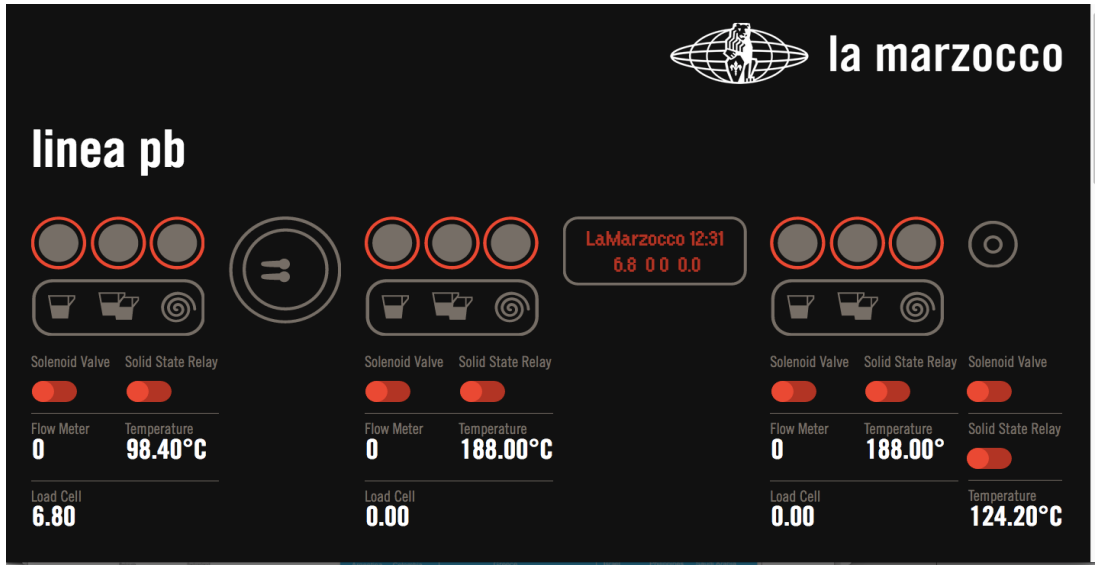
http://www.cisco.com/c/en/us/solutions/internet-of-things/iot-fog-computing.html

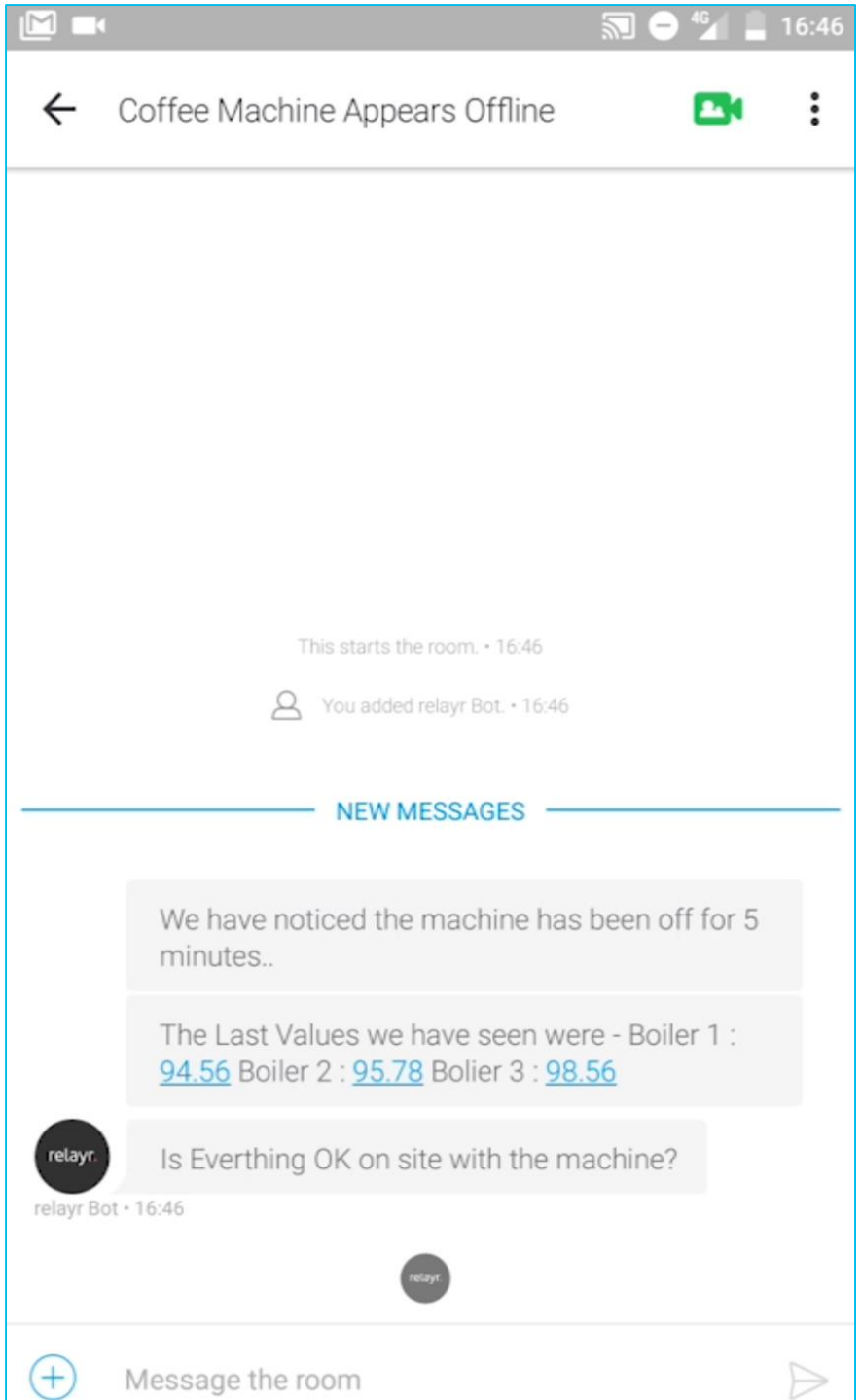
Inpeco Connected Machine

https://www.youtube.com/watch?v=peykFPb0PK8&feature=youtu.be

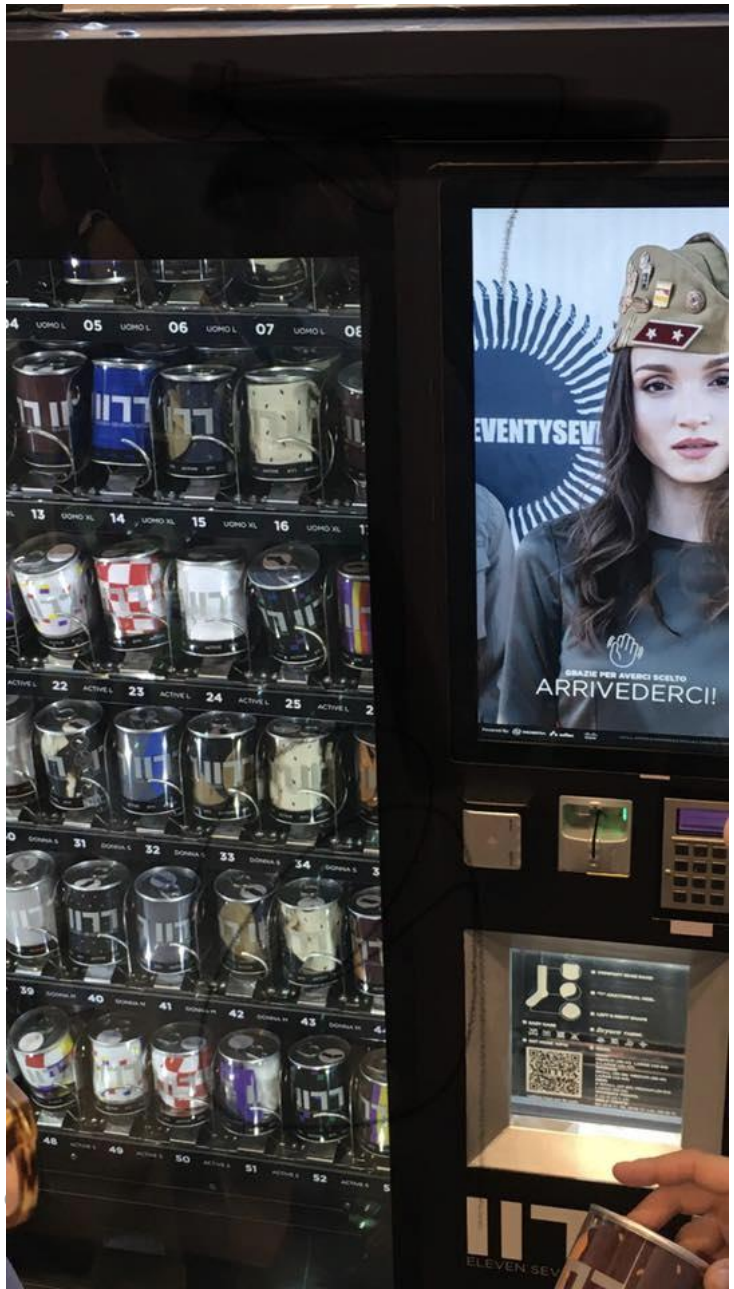
Human- Machine Interaction

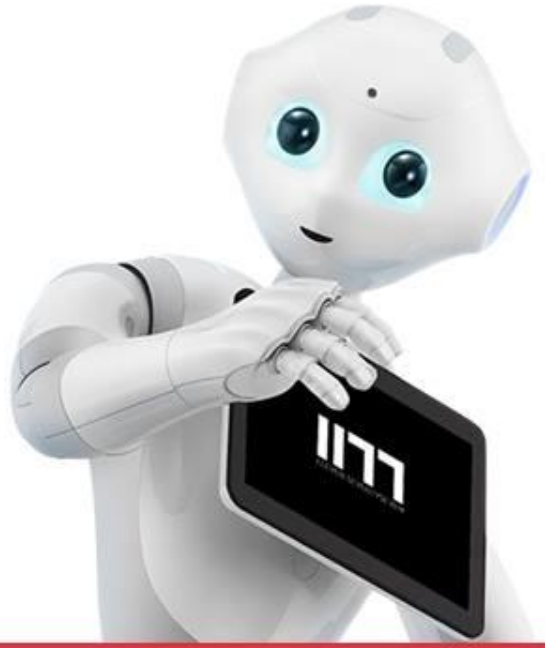
https://cisco.box.com/v/LMConnectedMachine-SparkBot





1177 Connected Machine





Smart Logistic & Asset Tracking

Manufacturing Industry Trends

Customer Top Imperatives

Wireless Identification

- **High value asset location**
  Parts, equipment, supplies
- **Enterprise Asset Utilization**
  No need to over provision
- **Material Flow**
  Deliver the right component to the right place at the right time

Heavy Equipment Manufacturer

- 5% overall improvement in cycle time
- 40% improvement in replenishment times

Reduced Scrap

- **Avoid waste**
  Accurate WIP accounting
- **FIFO Compliance**
  Reduce outdated stock
- **Rework Management**
  Coordinate similar rework

Glass Manufacturer

- 65% reduction in scrap due to lost glass
- Increased throughput and decreased cycle time

Logistics Efficiency

- **Smart Dispatching**
  Engage nearest appropriate asset
- **Distribution Center Management**
  Ensure availability of carriers
- **Container Tracking**
  GPS/Cellular/Satellite tracking of goods
- **eKanban**
  Automate restocking triggers

Package Delivery Service

- $1M annual savings in lost roll cages
- 200 countries, 900 deports, 19K trucks, 30K cages

Asset Management Use Cases

Asset Utilization

- Track supplies in transit
- Inventory accuracy of receivables
- Retrieve misplaced components, subassemblies, etc.
- Locate missing tools, test harnesses, etc.
- Vehicle location for smarter dispatch

Material Flow Efficiency

- Wireless restocking trigger
- Choke point recording
- The *right* supplies get to the *right* place
- In-line rework
- Bar Code replacement

Business Value

- ✓ Production throughput increase
- ✓ Improved equipment utilization
- ✓ Reduced scrap
- ✓ Labor efficiency
- ✓ “82% improvement in retrieval time results in increased throughput, and “on time delivery” was improved 13%” – Ops Manager, Semiconductor

People Awareness Use Cases

Skills Match

- Locate people with specific skill sets or certifications nearest to the site that requires those skills

Compliance

- Virtual ring fence
- Movement of contractors and visitors need to be monitored in areas that include hazardous waste and security clearances

Safety

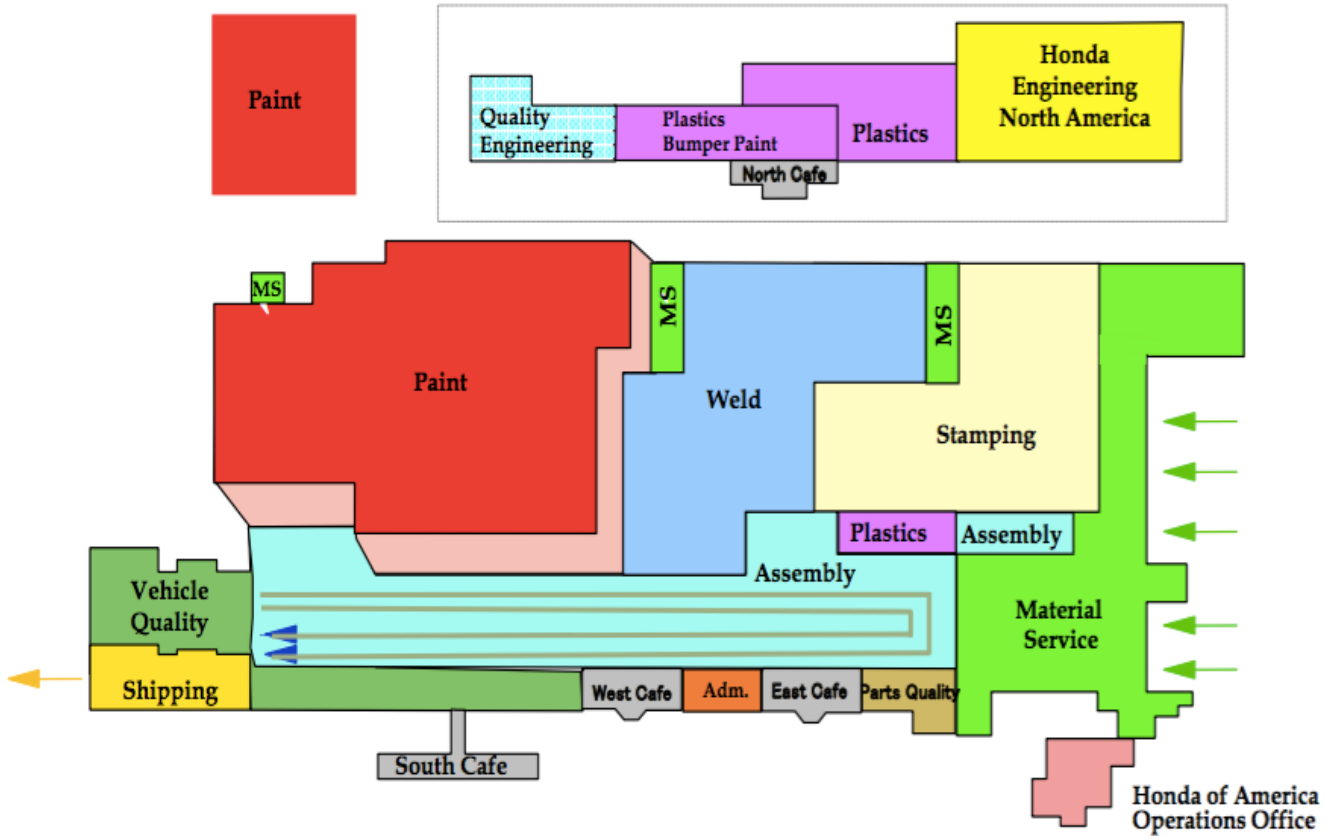
- Panic button to alert emergency response

Extending the Value

- Video surveillance
- Mobile collaboration
- Wearables
- Digital Dashboards
- Emergency notification

A Customer Example

5Million Sq Ft Plant



Reduce Waste & Inefficiencies

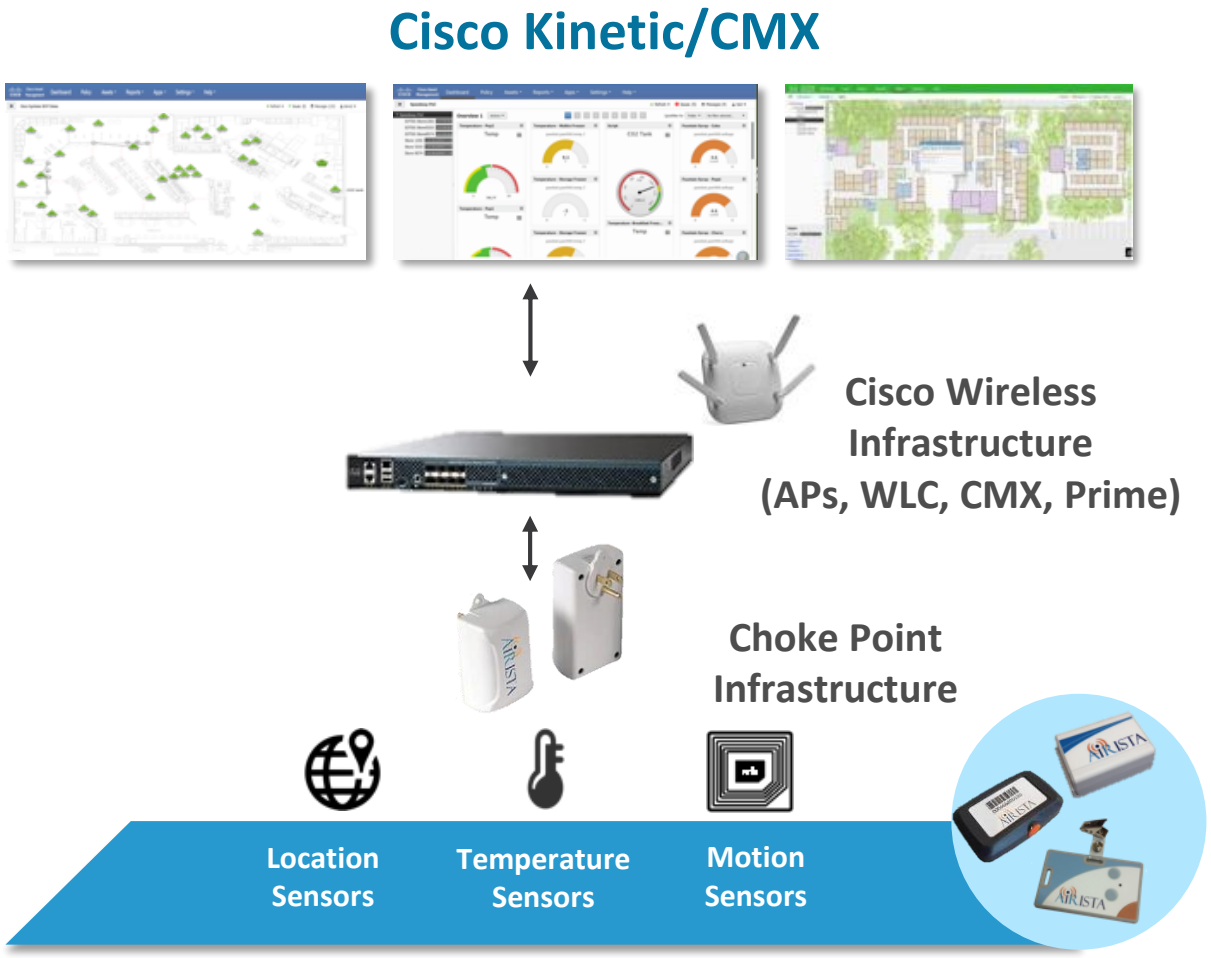
Customer Situation

- Auto manufacturers use antiquated processes in a rapidly changing market that squeezes margins and cycle times
- Paper based systems require hours or days to surface valuable production insights
- Equipment and entire vehicles get misplaced and lost
- Manual bar code scans are a waste of time & motion
- Suppliers' part carriers are not returned to suppliers, impacting ability to restock

Customer Goals

- Locate missing equipment & vehicles when needed
- Improve component accuracy through wireless reads of vehicle identification
- Remove wasted motion associated with handheld reads of bar code sheets
- Ensure on-time parts supply through efficient utilization of suppliers' carriers

Track & Trace Solution



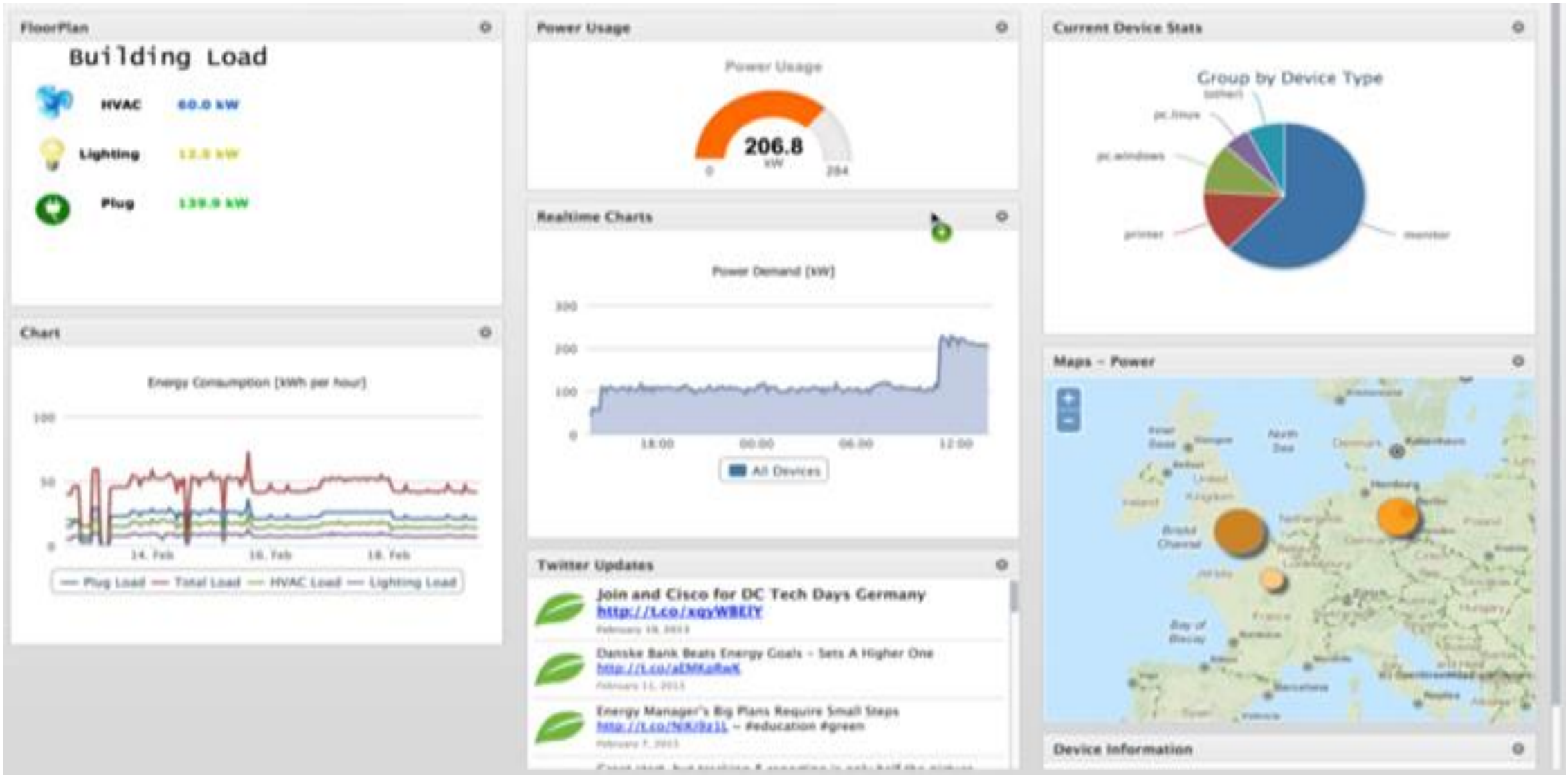
Capabilities

- Integration with MES systems for process automation and record keeping
- Map visualization, event configuration, and business rules
- Wi-Fi & Bluetooth Low Energy (BLE) sensors for assets, personnel, and condition (motion, temperature, humidity, etc.)

Solution Benefits

- Real-time monitoring of location (sensor signal strength and triangulation of x-y coordinates)
- Policy automation to notify when asset crosses designated boundaries
- Simplified cloud deployment and sensor deployment

Real-Time Location & Visualization Dashboard



Partner Sensors

					
Asset Tracking Motion sensor	**Personnel Tracking Buzzer alert**	**Temp Sensing Humidity**	**Outdoor GSM requires cell plan**	**Beaconing Choke Point AC, PoE, Battery**	**Receiver Choke Point**
T4 Asset Tag WiFi BLE	**T5** Personnel Tag WiFi BLE	**Air-T4** Temp & Humidity Sensing	**Outdoor Asset Tracking** (GSM requires cell plan)	**Locator** Exciter Choke Point AC, PoE, Battery	**PSU** BLE Detector Choke Point AC, PoE

Case Study – Large Auto Manufacturer

Challenges

- Need to track high-value assets (white bodies disappear; $1300 for each white body scrapped in weld)
- Paper based system to pull work instructions is inefficient

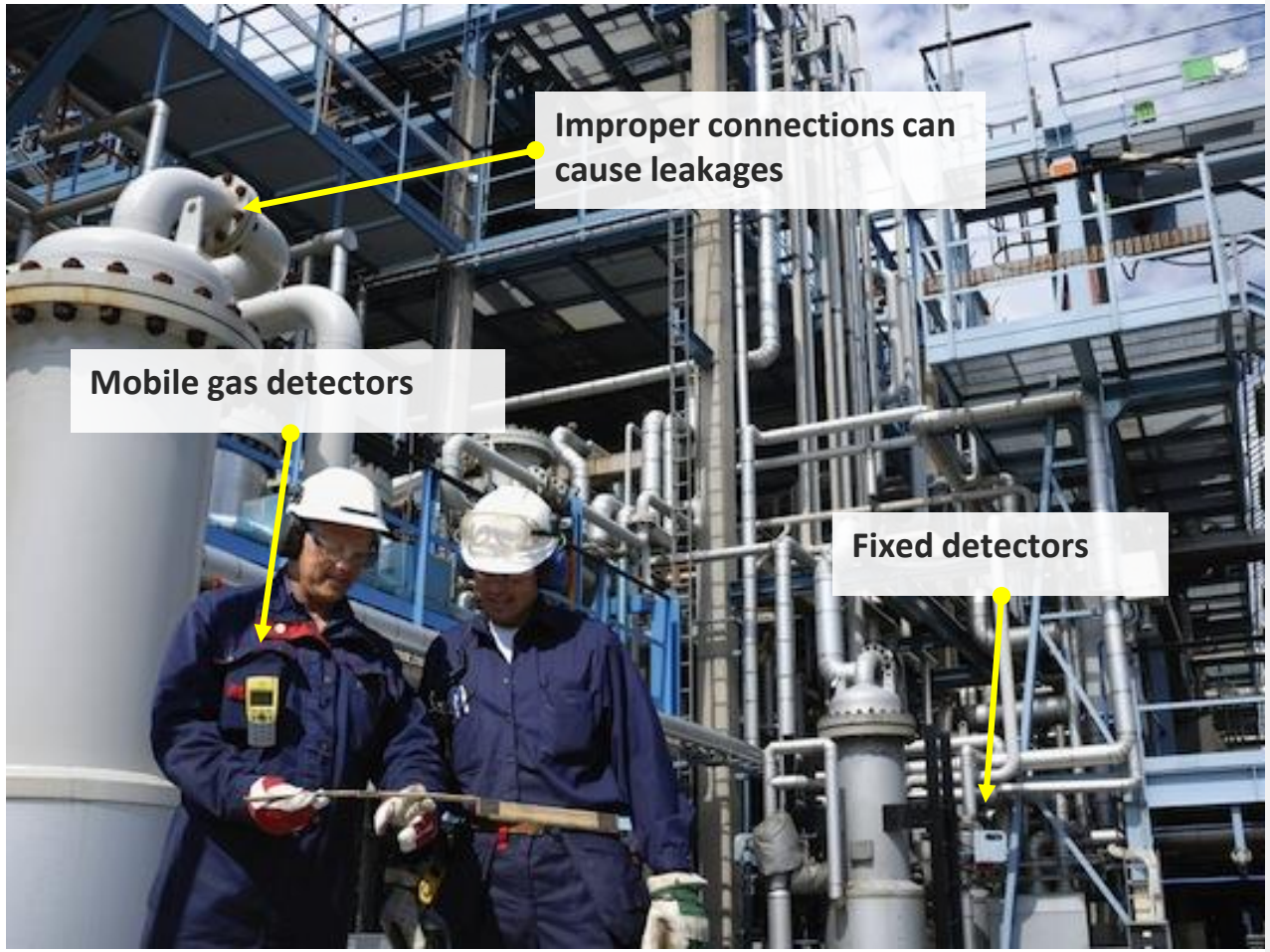
Solution

- Tag each white body before weld to track; associate VIN with tag ID
- Replace manual bonnet sheet scans with wireless identification; associate VIN with tag ID - workstations along assembly scan the bonnet sheet for instructions specific to VIN

Business Outcomes

- 1.5 white bodies/shift; 2 shifts/day x 250 days/yr; Annual savings = $1M
- Eliminate 2 headcount per shift; remove waste associated with paper processes; Annual savings = $250K savings

Connected Refinery
A Customer Example



Gas Monitoring and Detection

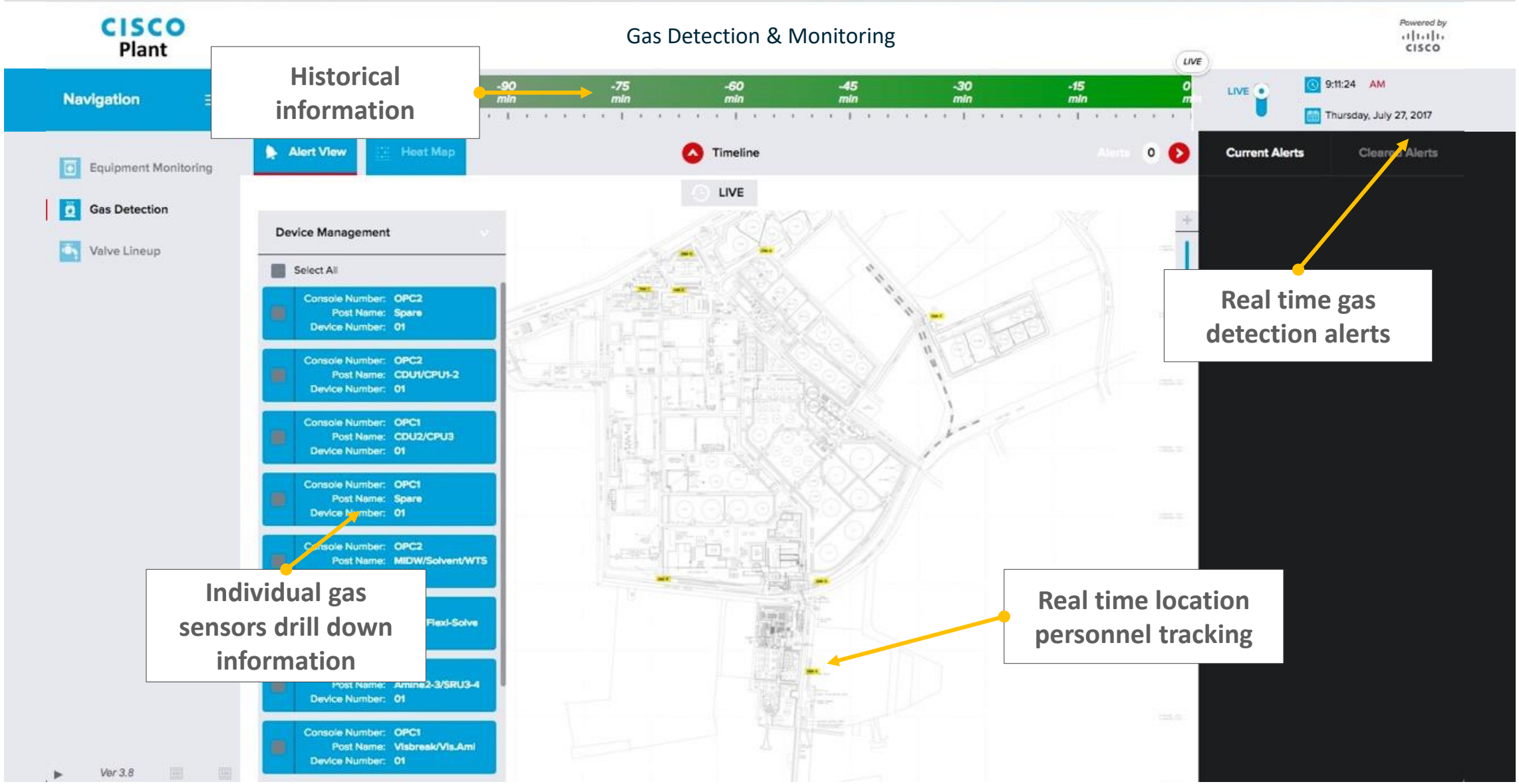
Customer Situation

- Fixed location detectors provide limited visibility of leaks
- Personnel location unknown in relation to leaks
- Work start delayed due to gas detection survey
- Fixed wired detectors are expensive to install
- Safety of personnel of utmost importance

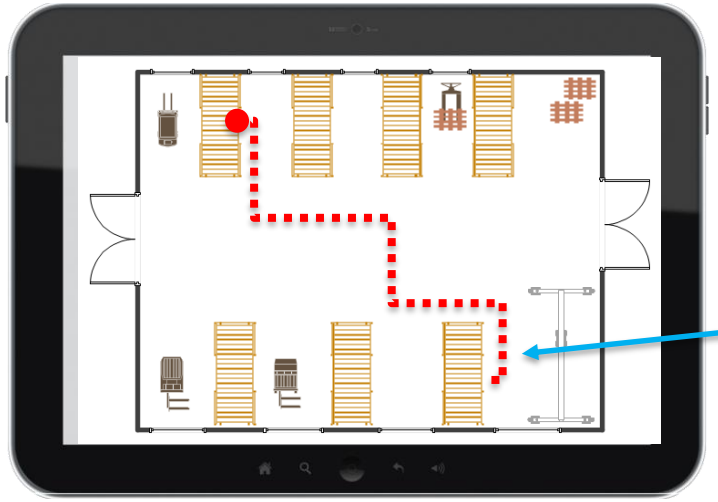
Customer Goals

- Improve productivity and time to start hot work
- Improve visibility into real time gas detection and personnel location
- Optimize evacuation route planning
- Meet staff safety goals

Real-time Site Monitoring Dashboard

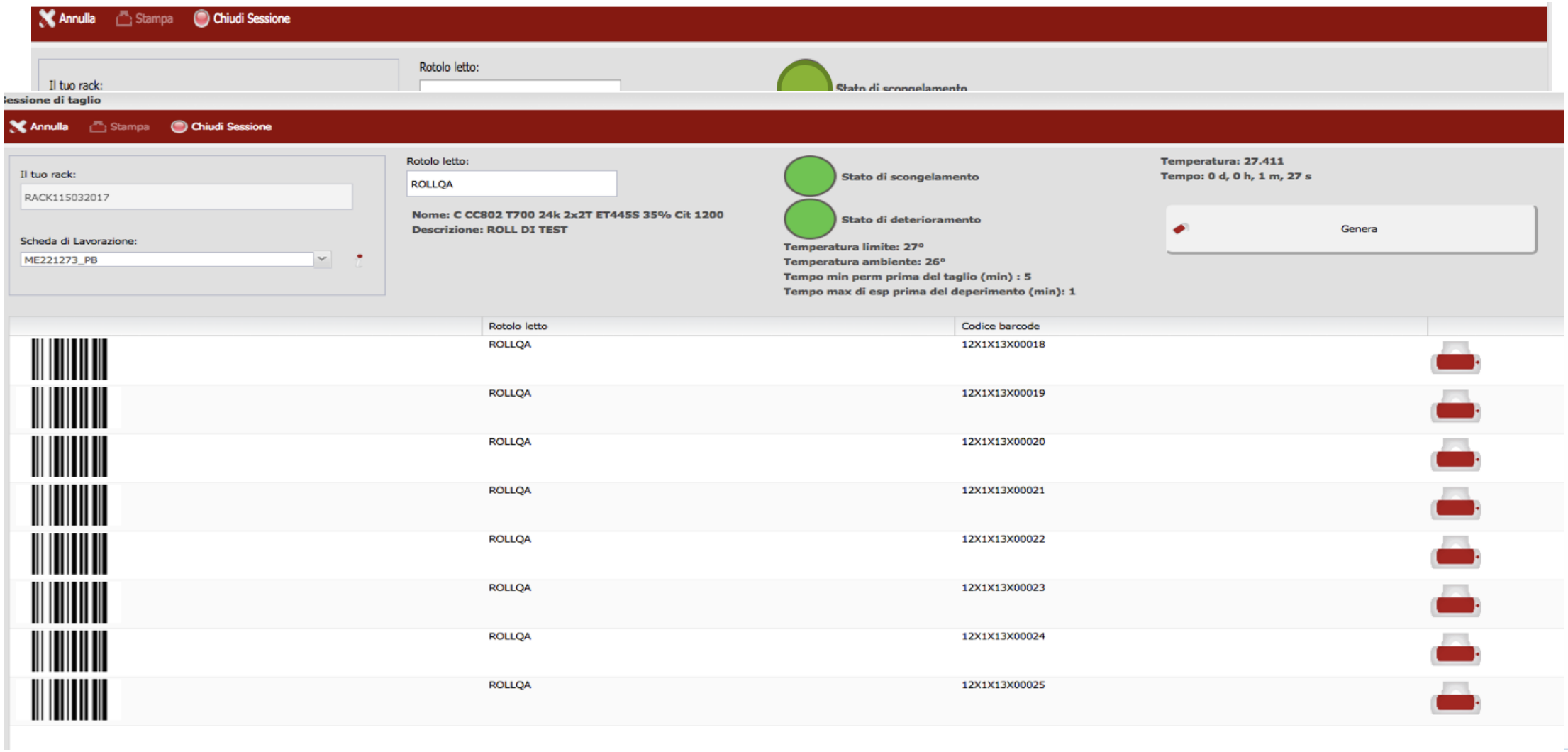


Location Based Asset Tracking
Trolleys

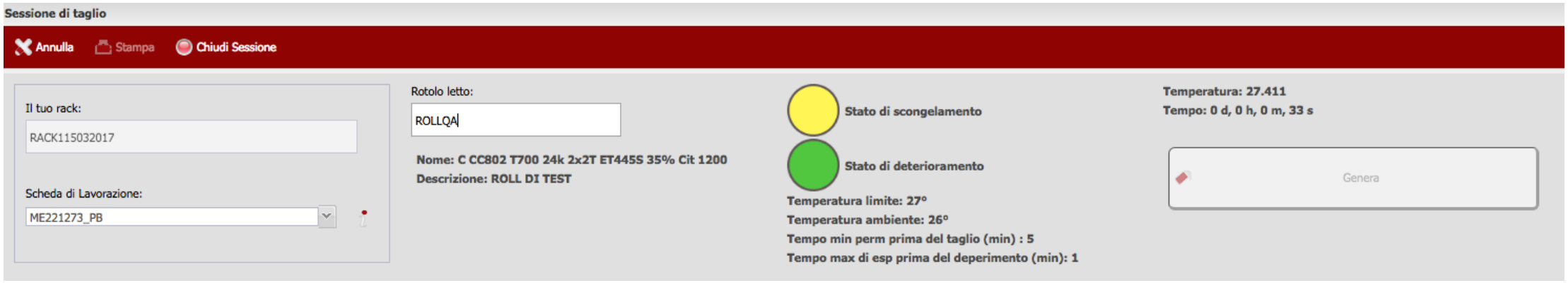


Dallara – Connected R&D + Smart Logistic

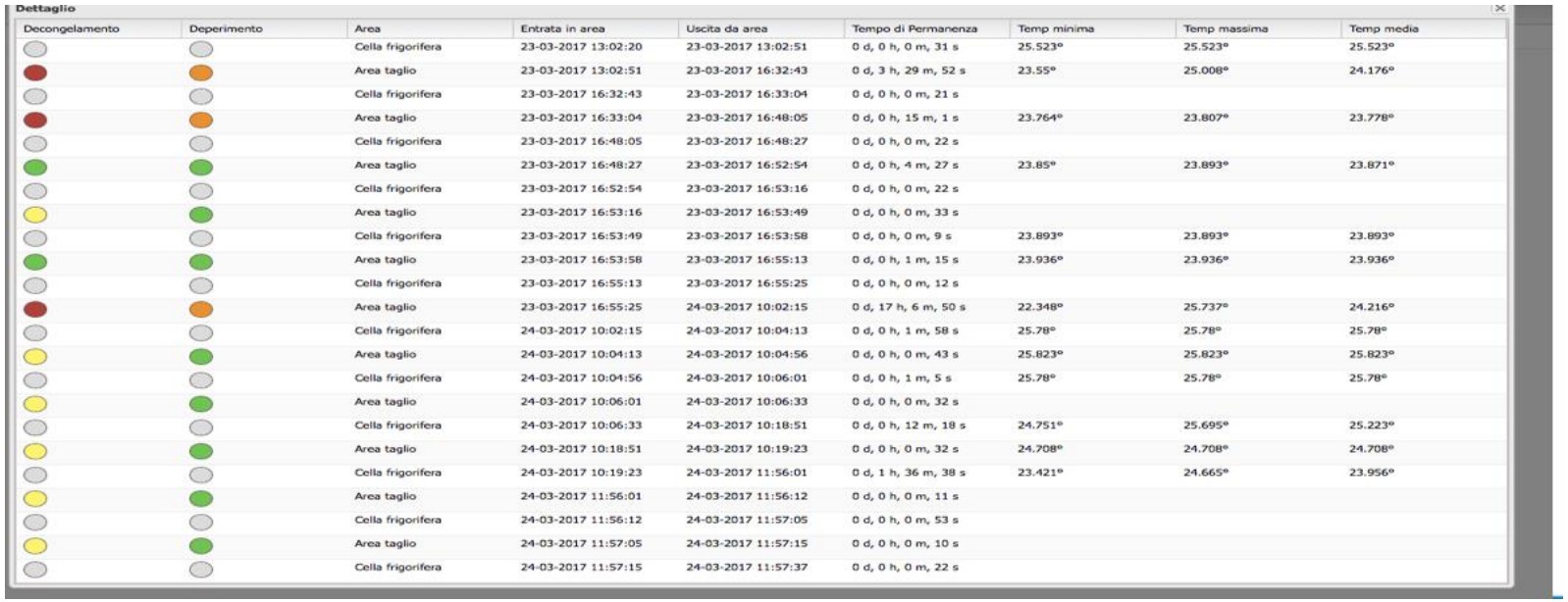
Postazione di taglio – Stato di ALERT Postazione di taglio – Codifica e stampa dei barcode



Postazione di taglio – Rotolo non scongelato



Stato dei ROTOLI/RACK



Dettaglio

Decongelamento	Deperimento	Area	Entrata in area	Uscita da area	Tempo di Permanenza	Temp minima	Temp massima	Temp media
		Cella frigorifera	23-03-2017 13:02:20	23-03-2017 13:02:51	0 d, 0 h, 0 m, 31 s	25.523°	25.523°	25.523°
		Area taglio	23-03-2017 13:02:51	23-03-2017 16:32:43	0 d, 3 h, 29 m, 52 s	23.55°	25.008°	24.176°
		Cella frigorifera	23-03-2017 16:32:43	23-03-2017 16:33:04	0 d, 0 h, 0 m, 21 s			
		Area taglio	23-03-2017 16:33:04	23-03-2017 16:48:05	0 d, 0 h, 15 m, 1 s	23.764°	23.807°	23.778°
		Cella frigorifera	23-03-2017 16:48:05	23-03-2017 16:48:27	0 d, 0 h, 0 m, 22 s			
		Area taglio	23-03-2017 16:48:27	23-03-2017 16:52:54	0 d, 0 h, 4 m, 27 s	23.85°	23.893°	23.871°
		Cella frigorifera	23-03-2017 16:52:54	23-03-2017 16:53:16	0 d, 0 h, 0 m, 22 s			
		Area taglio	23-03-2017 16:53:16	23-03-2017 16:53:49	0 d, 0 h, 0 m, 33 s			
		Cella frigorifera	23-03-2017 16:53:49	23-03-2017 16:53:58	0 d, 0 h, 0 m, 9 s	23.893°	23.893°	23.893°
		Area taglio	23-03-2017 16:53:58	23-03-2017 16:55:13	0 d, 0 h, 1 m, 15 s	23.936°	23.936°	23.936°
		Cella frigorifera	23-03-2017 16:55:13	23-03-2017 16:55:25	0 d, 0 h, 0 m, 12 s			
		Area taglio	23-03-2017 16:55:25	24-03-2017 10:02:15	0 d, 17 h, 6 m, 50 s	22.348°	25.737°	24.216°
		Cella frigorifera	24-03-2017 10:02:15	24-03-2017 10:04:13	0 d, 0 h, 1 m, 58 s	25.78°	25.78°	25.78°
		Area taglio	24-03-2017 10:04:13	24-03-2017 10:04:56	0 d, 0 h, 0 m, 43 s	25.823°	25.823°	25.823°
		Cella frigorifera	24-03-2017 10:04:56	24-03-2017 10:06:01	0 d, 0 h, 1 m, 5 s	25.78°	25.78°	25.78°
		Area taglio	24-03-2017 10:06:01	24-03-2017 10:06:33	0 d, 0 h, 0 m, 32 s			
		Cella frigorifera	24-03-2017 10:06:33	24-03-2017 10:18:51	0 d, 0 h, 12 m, 18 s	24.751°	25.695°	25.223°
		Area taglio	24-03-2017 10:18:51	24-03-2017 10:19:23	0 d, 0 h, 0 m, 32 s	24.708°	24.708°	24.708°
		Cella frigorifera	24-03-2017 10:19:23	24-03-2017 11:56:01	0 d, 1 h, 36 m, 38 s	23.421°	24.665°	23.956°
		Area taglio	24-03-2017 11:56:01	24-03-2017 11:56:12	0 d, 0 h, 0 m, 11 s			
		Cella frigorifera	24-03-2017 11:56:12	24-03-2017 11:57:05	0 d, 0 h, 0 m, 53 s			
		Area taglio	24-03-2017 11:57:05	24-03-2017 11:57:15	0 d, 0 h, 0 m, 10 s			
		Cella frigorifera	24-03-2017 11:57:15	24-03-2017 11:57:37	0 d, 0 h, 0 m, 22 s			

Isole di lavoro


CISCO