Introduction
Command Centers in public safety, utilities, transportation, government and industry act as nerve centers for their organizations, coordinating time sensitive, event-driven responses for everything from air traffic to military missions to emergency response operations.

These Operations and Dispatch Centers have always had complex, unified communications and collaboration needs presenting unique challenges to command center operators and their IT departments.

Today, as organizations experience more incidents and higher call volumes, there is more pressure than ever to streamline the outdated patchwork of proprietary systems, separate networks and legacy technologies.

New solutions are needed by these institutions that are faced with the unnerving task of modernizing aging systems, incorporating new tools and enabling more cohesive teamwork as the drumbeat of technology marches on.

The Current Environment
In the past, because technologies were inherently separate a silo-oriented approach to purchasing technology resulted in multiple systems being deployed side-by-side and made to interoperate as best they could.

The current landscape is a sprawl of proprietary networks, isolated management systems, and databases that have limited ability to communicate with each other.

As you see in Figure 1 (next page), dispatchers have to manage communications with many different people across disparate networks and with different systems. This negatively impacts organizations by limiting their ability to share information which can compromise situational awareness and effective response.

One of the biggest challenges is giving command center staff a seamless, easy-to-use set of tools that may include: various telephones and turrets, radio consoles, backup phones, email/IM/chat and incident response systems, audio/video conferencing and peripheral devices such as headsets, microphones, loudspeakers.

This communications and collaboration happens across disparate networks including the public switched telephone network (PSTN), cellular, radio, private networks, satellite and data networks.

Today, operators and IT staff manages a jumble of systems, networks and user interfaces (UI) that are nearing end of life and they face a dizzying set of choices and challenges as the great migration to modern Internet Protocol (IP) networks continues.
Enabling Smart and Connected Command Center and Dispatch Operations

Managing public safety, emergency services and the day-to-day activities of critical infrastructure and commercial activities depends on well-run operational command centers and the technologies on which they are built and contributes to the success of communities and countries.

The Cisco Smart and Connected Safety and Security portfolio transforms the way organizations and communities protect people, property, and critical infrastructure. It does this by providing a practical framework and proven set of integrated Cisco technologies — a Cisco Borderless Network foundation that supports Cisco Unified Communications and Collaboration tools, physical security, video, analytics, and Cisco partner solutions.

IP solutions promise many advantages over predecessor platforms. At the very highest level, there is no longer a need to have separate networks for voice and data, communications platforms are largely software-based and thus easier to deploy, expand and manage.

In this highly responsive and adaptive IP environment, disparate communications and information silos no longer exist. Legacy PBX systems, radios, and servers are transformed into a single intelligent network. The right information is securely delivered, to the right person, in the right format, at the right time.

Incoming calls and video streams can be distributed via a variety of sources: cellphones, IP phones and turrets, smartphones or tablets. Unlike a traditional network, a Cisco Borderless Network intelligently recognizes the type of end device and delivers the communication stream in the optimal format for that device — whether that is pushing content from a smartphone at the scene to a screen at the incident control room, or vice versa.
Solution Overview

The key components of Cisco Smart and Connected Command Center Operator Solution (see Figure 2) are part of a broad portfolio of Cisco Public Safety and Security solutions. These solutions are being adopted worldwide by Cisco customers in federal, state and local governments, as well as organizations operating in the energy, healthcare, and physical security sectors.

Key components of Cisco Smart and Connected Command Center Operator Solution include:

• **Cisco IP Interoperability and Collaboration System (IPICS):** Speeds up dispatch and incident response by enabling public safety teams to consolidate incident-related information — whether in voice, video, or data format — and instantly share it with any device type — IP phone, IP turret, cell phone, walkie-talkie, mobile device, or PC.

• **Cisco Unified Communications Manager (CUCM):** As the core of the Cisco Collaboration portfolio infrastructure, Cisco Unified Communications Manager is a unified communications call control platform that can deliver the right experience to the right endpoint.

• **IP Command Turret Unified Communicator (TUC):** As a Cisco Developer Network and SolutionsPlus partner, IP Command’s advanced, high-capacity turret platform is available directly from Cisco and offers integrated functionality with CUCM and IPICS to enable a rich communications & collaboration experience to command center operators.

• **Cisco Unified Computing System (UCS):** Cisco servers that unify computing, networking, management, virtualization, and storage access into a single integrated architecture. This unique architecture enables end-to-end server visibility, management, and control in both bare metal and virtual environments, and facilitates the move to cloud computing and IT-as-a-Service with fabric-based infrastructure.

![Figure 2. A unified communications fabric for enhancing monitoring, assessment, and response](ipcommand-networks.com)
Use Case Scenario – Natural Gas Operations Center

Picture a busy control center with a team of operators monitoring and keeping tabs on complex gas and electricity transmission and delivery systems. Pipelines function much like a railway network, with long and short lines and numerous pick-up and drop-off points along the way.

Pipelines move natural gas beneath the ground. Products we use every day such as fuel for our cars, or gas to heat our homes are transported through these pipelines. Gas Control Center Operators play a key role in ensuring safe and timely delivery of gas products. Operators must respond quickly to changes in pipeline pressures, identify possible leaks and emergency situations as they arise. Pipeline transmission lines are complicated structures and operators must be able to think on their feet and communicate effectively.

They use a variety of communications devices, networks and information databases to initiate and maintain contact with field operations personnel, state and local government officials and public safety entities while monitoring and tracking the transmission network. Gas Control Center Operators need sophisticated equipment to monitor the operations and status of pipelines. Their duties include:

- Monitoring and tracking the product as it moves through the pipelines
- Controlling product batches when they enter and exit the pipeline system
- Diverting or shutting off flow of gas in case of an emergency or maintenance shutdown
- Supervising emergency situations and dispatching crews when required

Benefits

With Cisco Smart and Connected Command Center Operator Solution organizations can:

- Unify communications and collaboration among organizations in turn reducing the time between an incident and response.

This is achieved by:

- Unifying radio, cellular, satellite, IP telephony and recording systems into a single integrated operating environment
- Enabling operators to visualize, prioritize and action various types of communications through a rich, high-capacity UI
- Enhancing collaboration through ad hoc conference call and line sharing capabilities
- Empowering support teams and first responders with tools to instantaneously receive information from different sources, process the information, present it in an easy-to-understand fashion tailored for the person’s role, to their device of choice, and enable decision makers to assign tasks to field personnel.
- Improving intelligence management by enabling personnel to gather information from different sources, including citizens, first responders, and infrastructure management systems
- Making processes more effective and efficient, for example, through the use of tools that analyze, correlate, and consolidate data into roles-based, actionable information.

- Ensure confidentiality, interoperability, and availability of information by:
  - Streamlining the flow of data from centralized databases, sensors and first responders
  - Enabling any-to-any communications to transmit voice, video, and data, over wired or wireless networks
  - Building in extra redundancy and resilience so that the network remains available despite outages
Large Power Utility incorporated in the early 1900’s, this utility is one of the largest combination natural gas and electric utilities in the United States, where 20,000 employees carry out the business of transmission and delivery of energy.

The company provides natural gas and electric service to 8 million people throughout a 70,000-square-mile service area. Customers include over 20,000 schools, 3,000 hospitals, 20,000 high-tech companies and 700 military facilities.

As part of a large command center consolidation and safety process improvement program, the company is building state-of-the-art electricity and gas control centers where approximately 300 operators work 24x7 to monitor and manage the flow of energy to customers.

These operators will be able to conduct secure, integrated communications across radio, telephony, satellite and data networks using Cisco’s Unified Communications Manager (CUCM), Cisco Interoperability Cisco IP Interoperability and Collaboration System (IPICS) and IP Command’s Turret Unified Communicator (TUC) application.

The solution allows operators to have access to critical information databases, directories, calling lists, media recording and radio systems and transmission management resources at the touch of a button.

As a principal Transmission Network Service Provider (TNSP) and System Control Center Operator in Asia-Pacific, this organization operates in the National Electricity Market as an asset management, project management and contract management business. Customers include power generators, the state’s electricity distributor and large industry.

Snapshot of electricity transmission network:

• Is the 275,000 Volt (275 kV) backbone of the electricity supply system
• Provides super-highways of high-voltage electricity, transporting power from generation sources to metropolitan and regional areas of demand
• Delivers reliability and security of electricity supply in an economic, safe, socially and environmentally-responsible manner
• Supports the economic development of the economy
• Delivers clean renewable energy to the National Electricity Market
• Supports quality of life for all citizens

Company operators will be able to conduct secure, integrated communications across radio, telephony, satellite and data networks using Cisco’s Unified Communications Manager (CUCM), and IP Commands Turret Unified Communicator (TUC) application.

The solution gives operators a single high-capacity device that consolidates both voice and radio transmission over a single handset or headset and a customizable touch screen user interface featuring call queuing and priority window, displays, radio channel activity, single touch access to up thousands of key contacts and the ability to see up to 120 lines of activity on a single screen.
The Cisco Partner Ecosystem

A key element in the implementation of Cisco Smart and Connected Command Center Operator Solution is the partner ecosystem. The specific role of Cisco and Cisco partners will vary depending on the complexity of each project, but assures the customer of comprehensive, scalable solutions with the expert services and global reach. Typical roles include:

- Thought leadership and planning for large-scale projects such as city redevelopment, new city build-out, and large-scale sporting events. Cisco ecosystem partners include Accenture and AECOM
- General contractors that take these plans to the development stage and act as the contract lead responsible for executing service delivery. Examples include companies such as SKANSKA, Honeywell, Bin Laden Group, and Schneider.
- Technology Partners providing specific vertical solutions that will be part of the larger Smart Connected Community.
- System Integrators interconnecting the various technology components of the solution on behalf of the customer. Examples include EADS, IBM, Thales, Raytheon, GD, and LM.
- Operators delivering services or operating services for the customer as part of an outsourced / managed service model. These partners can be governmental-owned (full or partly) such as Airwave in UK, or private companies or service provider organizations.
- Financial Partners such as Cisco Capital or other funding entities such as the World Bank or European Union.
- Cisco Safety and Security Advanced Technology Partners with the training and experience to install all the Cisco elements of the solution.

The Cisco Unified Communications & Collaboration Advantage

For the customer, working with Cisco has many advantages. These solutions have been certified, validated and tested to ensure interoperability and are optimized for a Cisco-powered network and CUCM collaboration applications and Cisco IPICS solutions.

HIGHLIGHTS

- Certified interoperability with leading radio, incident response, workforce enablement, turret and media recording solutions
- Confidence in deploying a Cisco-validated design for critical communications infrastructure
- Eliminating the need to invest in separate switching infrastructure
- Adherence to best practices in physical security
- Adherence to established and emerging industry standards
- Leveraging in-house or Cisco partner expertise for MAC, maintenance and support
- Leveraging investment in other Cisco UC applications for the operator environment
- Eliminating the need for separate procurement, negotiation for purchase

For additional information or to speak with someone regarding Cisco Smart and Connected Safety and Security, please contact your local Cisco office/partner or pss-as-support@cisco.com