ASCOM IP-DECT

- A RELIABLE COMMUNICATIONS SOLUTION

The Best of Two Worlds

- **IP** (Internet Protocol) – Universal standard for inter-networking that maximizes scalability and interoperability.

- **DECT** (Digital Enhanced Cordless Telecommunications) - Secure radio communication standard that delivers superior voice quality.

Wideband Audio

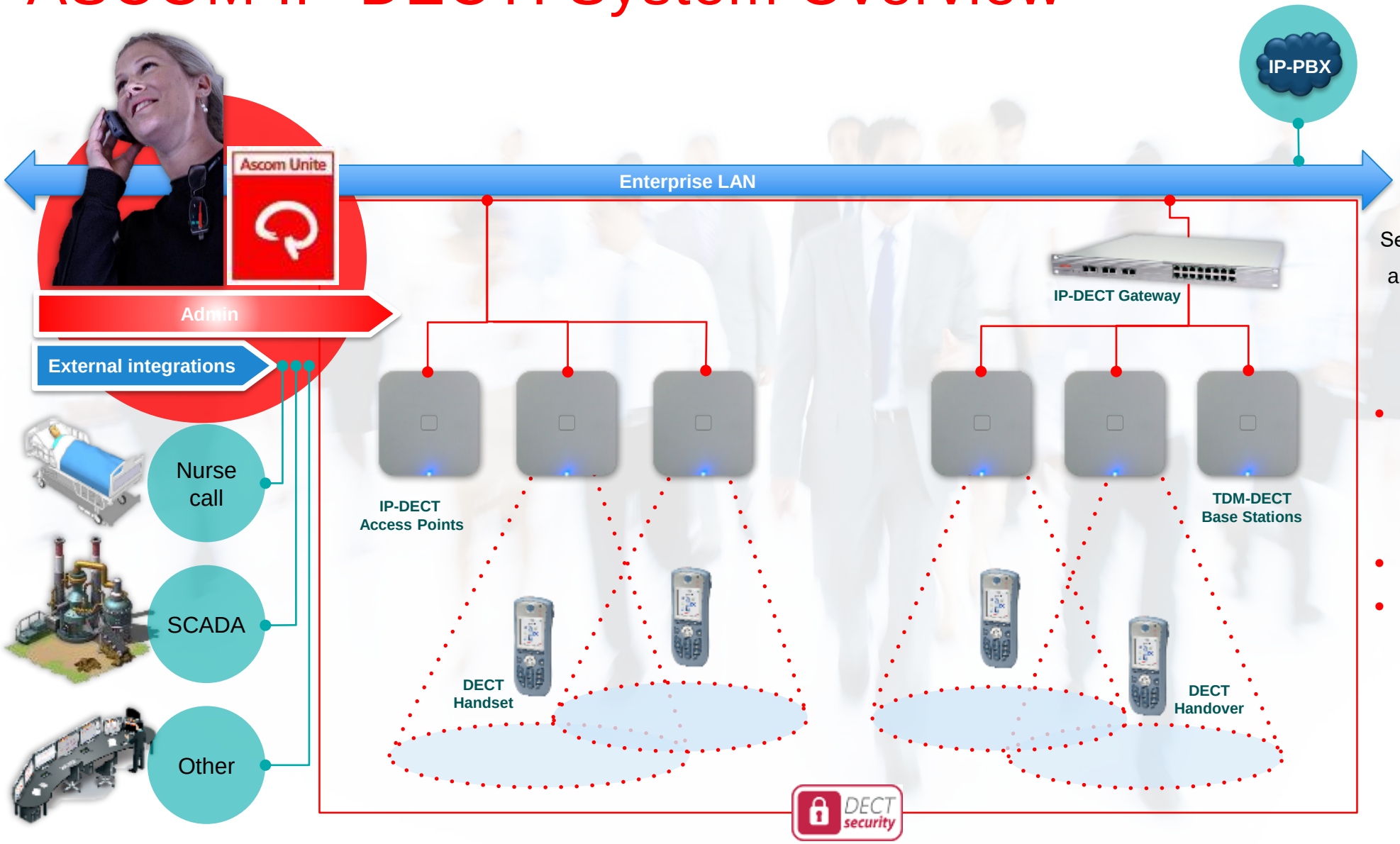
- **G.722** codecs extend audio frequency range (50Hz to 7000Hz), which a significant improve over narrowband codecs used for traditional telephony.
- Improves user experience, enabling conversations with clearer more natural sounding speech quality.

ASCOM IP-DECT – Fundamentals

- DECT standard specifies radio communication between base stations and handsets.
- Several DECT handsets can be connected via a single base station
- Each Ascom base station can maintain up to 8 calls simultaneously.
- Dedicated frequency bands: 1880-1930 MHz.*

*Frequency Range	Max. Output Power	Region
1880-1895 MHz	10mW	Taiwan
1880-1900 MHz	10mW	Europe, Middle East & Africa, Australia, New Zeeland, and parts of Asia
1900-1906 MHz	10mW	Thailand
1910-1930 MHz	10mW	South America
1920-1930 MHz	4mW	North America

ASCOM IP-DECT: System Overview



ASCOM IP-DECT

Secure wireless HD Voice™ telephony and messaging, independent of PBX.

Basic building blocks:

- **IP-DECT Infrastructure**
  - IP-DECT Access points
  - IP-DECT Gateway
  - TDM-DECT Base stations
- **DECT Handsets**
- **Unite Middleware**

IP-DECT Access Point

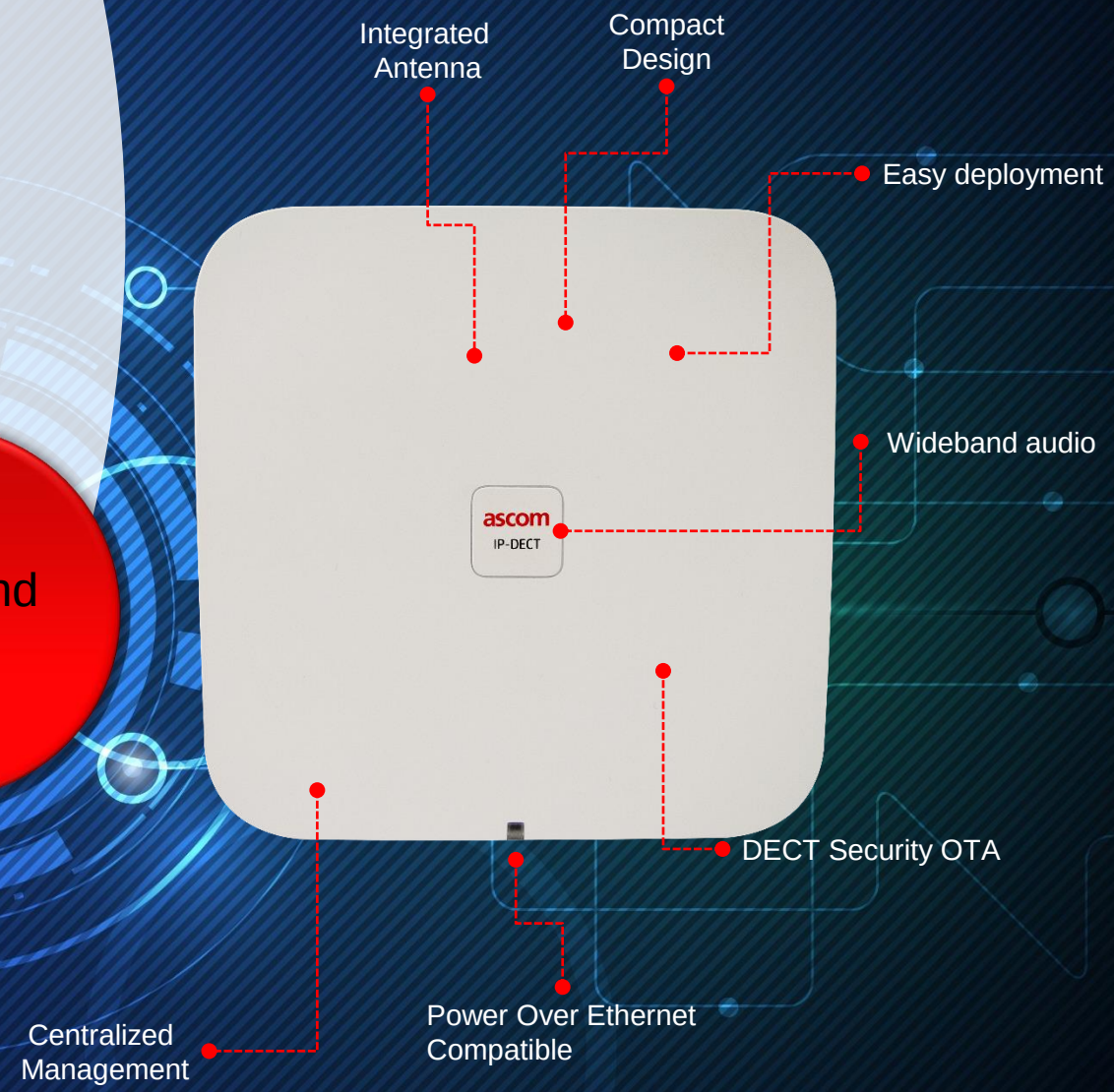
Connects directly to IP network

12 channel IP-DECT Access Point with wideband audio the enables better quality sound with high definition clarity.

Includes a dedicated alarm channel and handles up to 8 simultaneous calls.

- Use existing LAN cabling.

Wideband audio

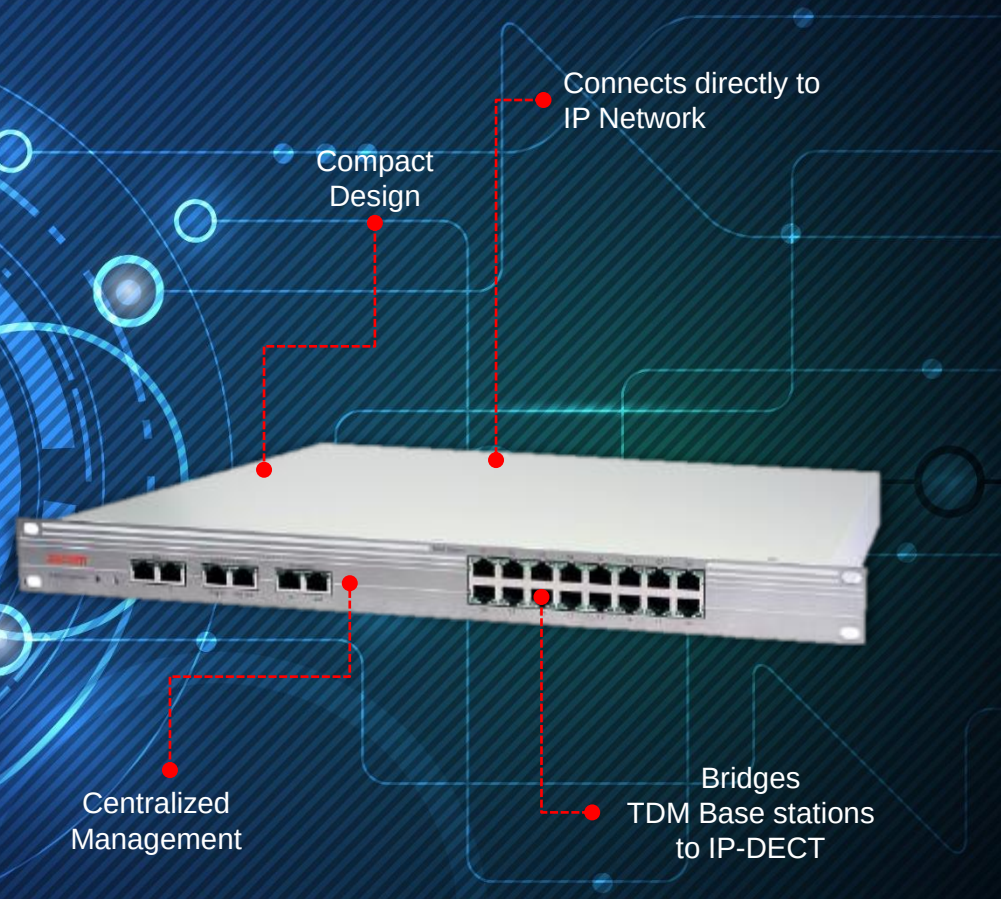


Ascom IP-DECT Gateway

Upgrade or bridge traditional DECT to IP

A IP-DECT gateway that allows TDM-DECT base stations to interoperate with IP network.

- Bridge TDM-DECT with IP-DECT.
- Upgrade TDM-DECT sites with IP-PBX.

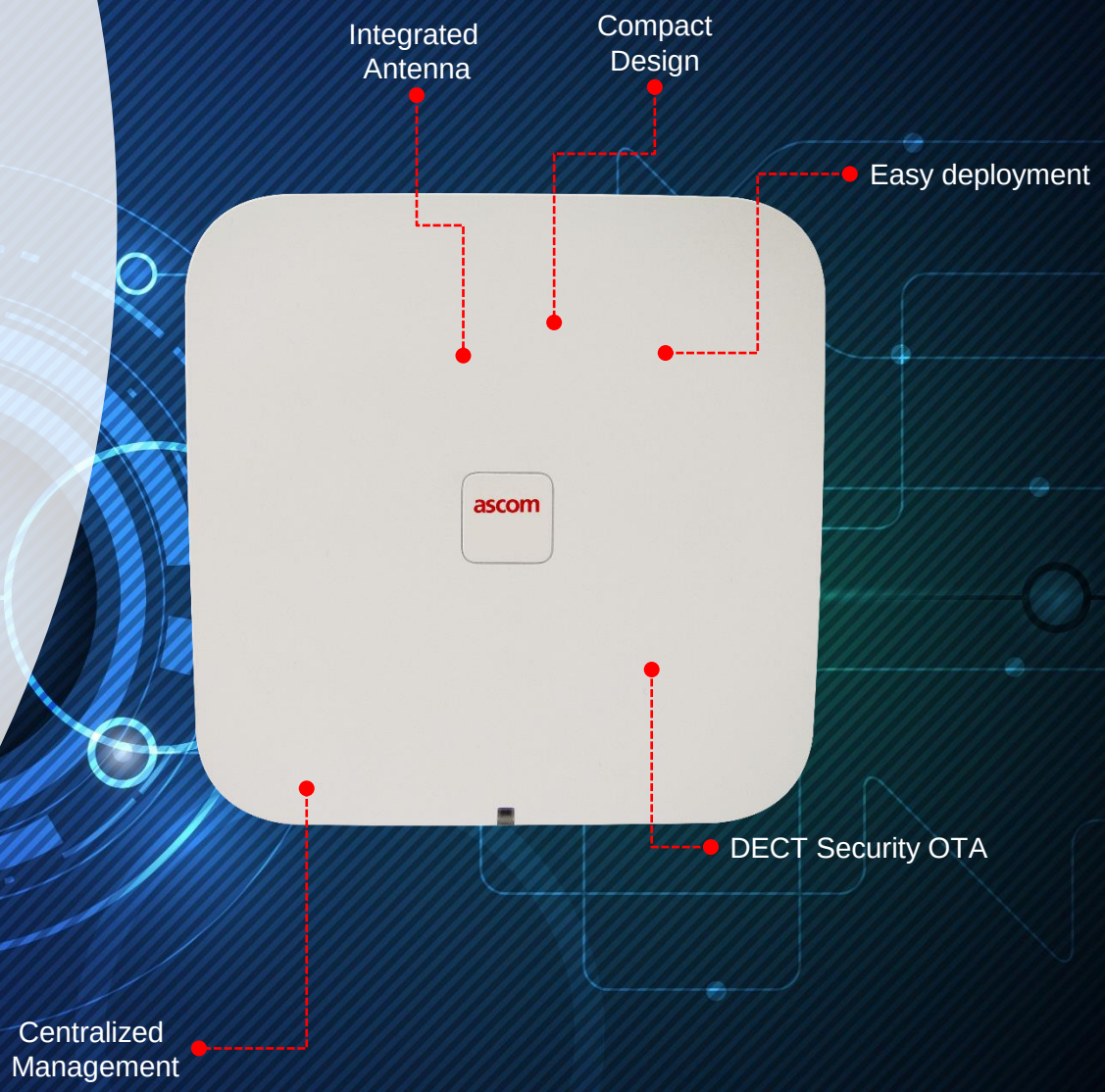


TDM-DECT Base Station

Expand traditional DECT installations

12 channel TDM-DECT base station with dedicated alarm channel; handles up to 8 simultaneous calls.

- Up to 1.8km max. cable length.
- Extend coverage to remote sites.



Design Vision

Our vision is to create innovative products that empower our users with reliable mobile communication; tailor-made for the environment and context for which the users operate. We express our premium brand values through craftsmanship and attention to details. The quality and durability of our products make their lifetime long, causing us to focus on timeless design without too explicit trend markers, but with a strong belief in the expression that is ours.

An Ascom handset is more than a telephone, it is a reliable COMPANION at work.

Ascom d43

With an all-new black design, the Ascom d43 is a durable DECT handsets that supports basic telephony.

- Wideband audio
- Robust design (backward compatible charging interface)
- Larger color TFT display (1,8” size, 128x160 pixels)
- Wideband audio with HD voice
- 3,5 mm headset connector
- Centralized management
- Easy deployment
- IP40

Ascom d63

Ascom d63 is robust DECT handset suitable for medium to high demand environments such as hospitals, elderly care, retail and enterprise.

- Robust design (backward compatible charging interface)
- Wideband audio
- Sharper color TFT display (2,0” size, 240x320 pixels)
- 3,5 mm headset connector
- Centralized management
- Interactive messaging
- Easy deployment
- IP44
- Available in 3 variants
  - Standard (no bluetooth)
  - Bluetooth
  - Advanced (Personal Alarm, Bluetooth, IR)

Ascom d63 Medic

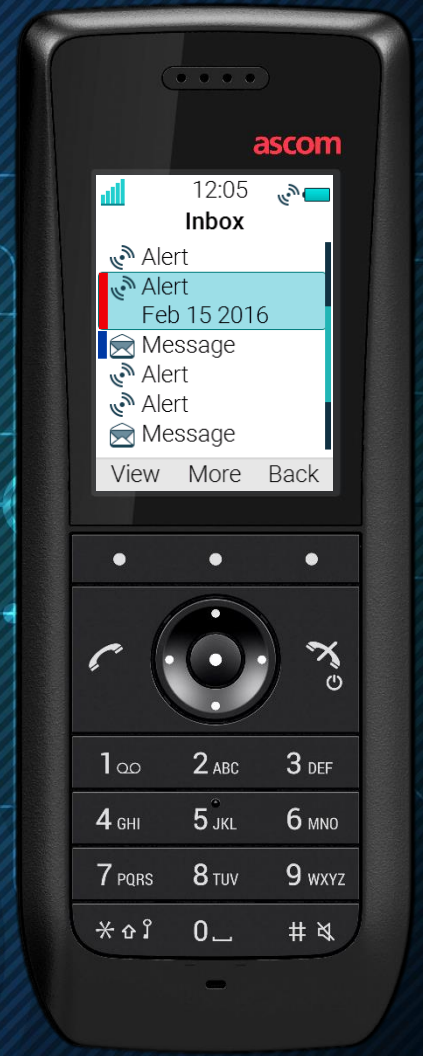
Ascom d63 (Medic) is robust DECT handset designed to resemble Ascom Myco™ therefore targeted at the healthcare segment.

- Wideband audio
- Robust design (backward compatible charging interface)
- Sharper color TFT display (2,0” size, 240x320 pixels)
- 3,5 mm headset connector
- Centralized management
- Interactive messaging
- Easy deployment
- IP44
- Available with advanced options
  - Infra red location
  - Bluetooth
  - Personal Alarm

Ascom Interoperability Approach

Our partners include most of the world's leading technology vendors. The Ascom Interoperability Program represents joint collaboration with technology partners to deliver world-class solutions with increased customer value.

Unite Messaging Suite®



- Secure and reliable
- Completely independent of telephony system

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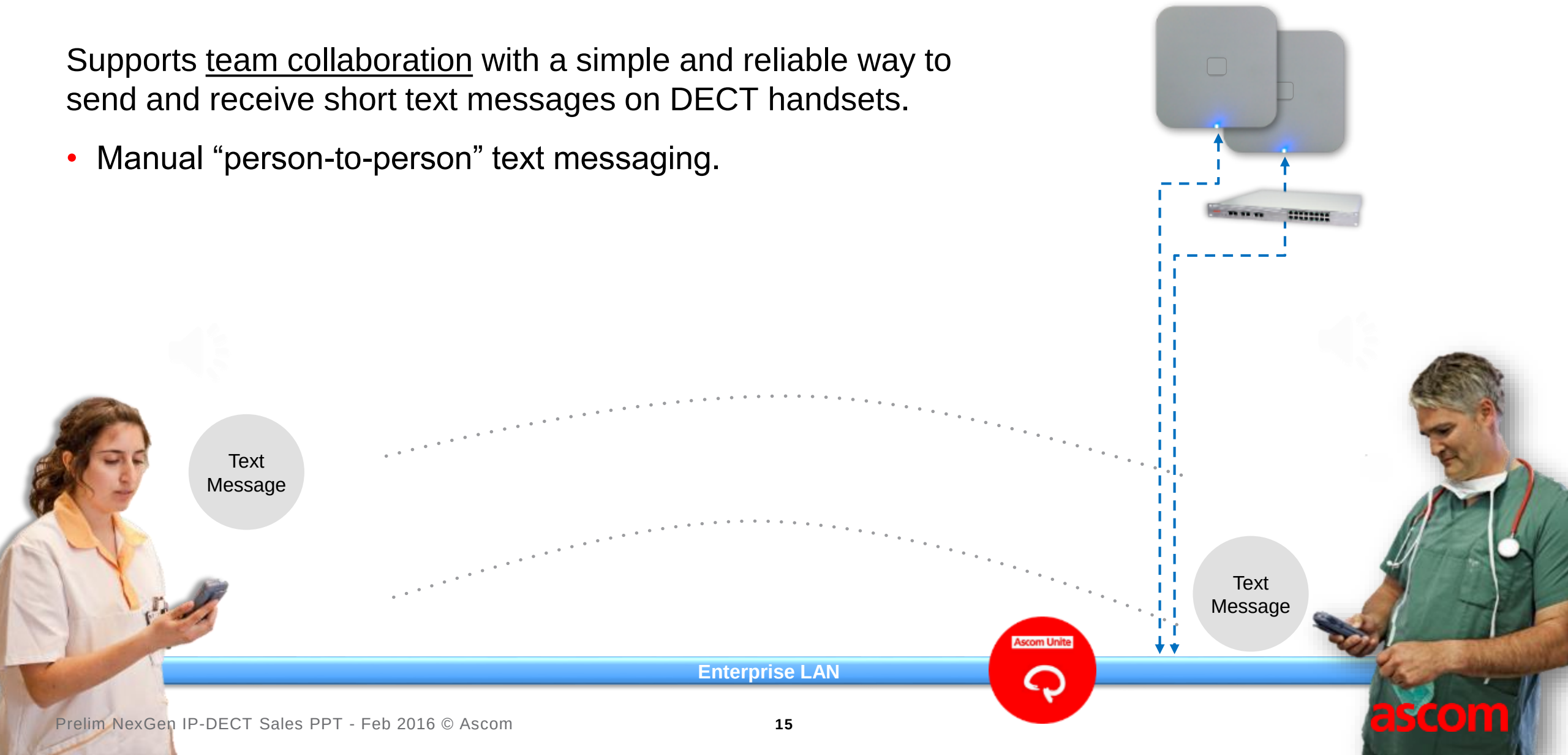
Basic Messaging

Supports team collaboration with a simple and reliable way to send and receive short text messages on DECT handsets.

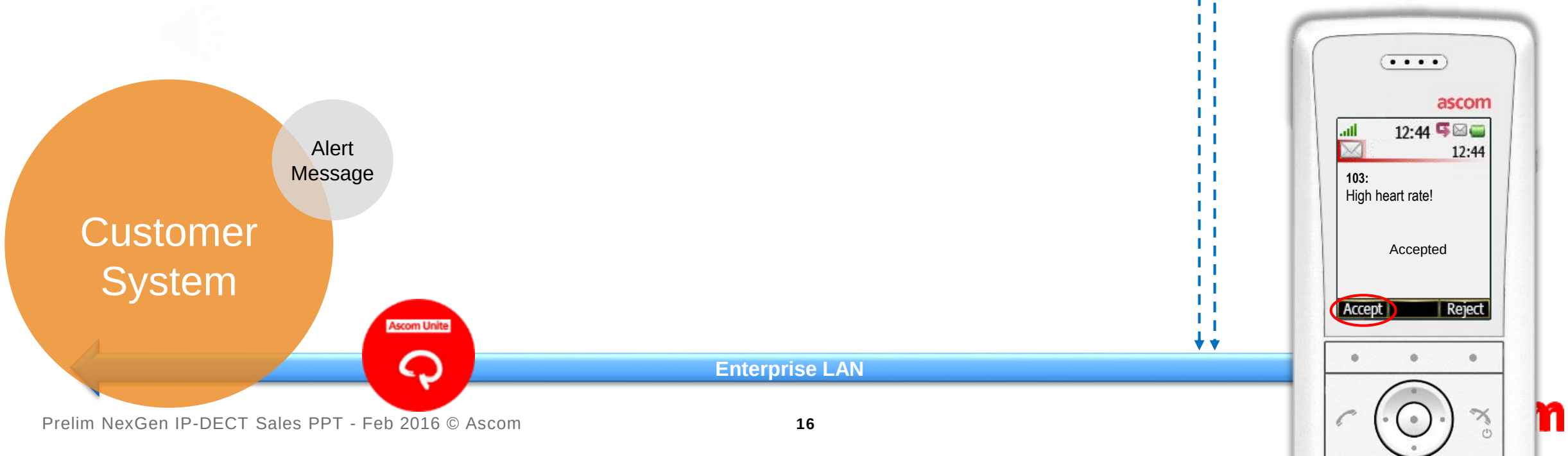
- Manual “person-to-person” text messaging.



Automated Alerts

Automated alerts (system-to-person) sent from customer systems integrated via Ascom Unite middleware.

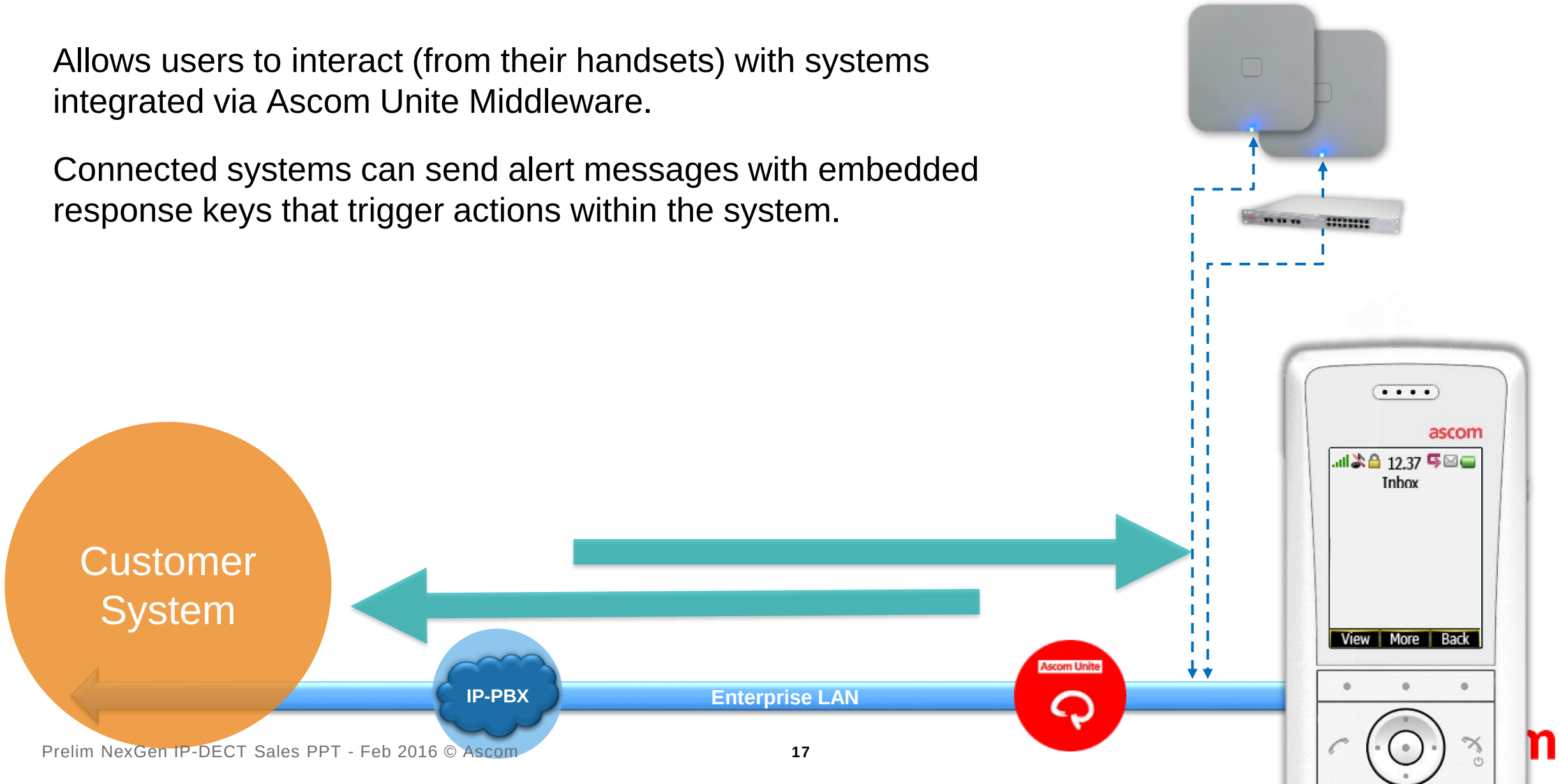
Acknowledgement sent back to the system via soft (Accept/Reject) keys on the handset.



Interactive Messaging

Allows users to interact (from their handsets) with systems integrated via Ascom Unite Middleware.

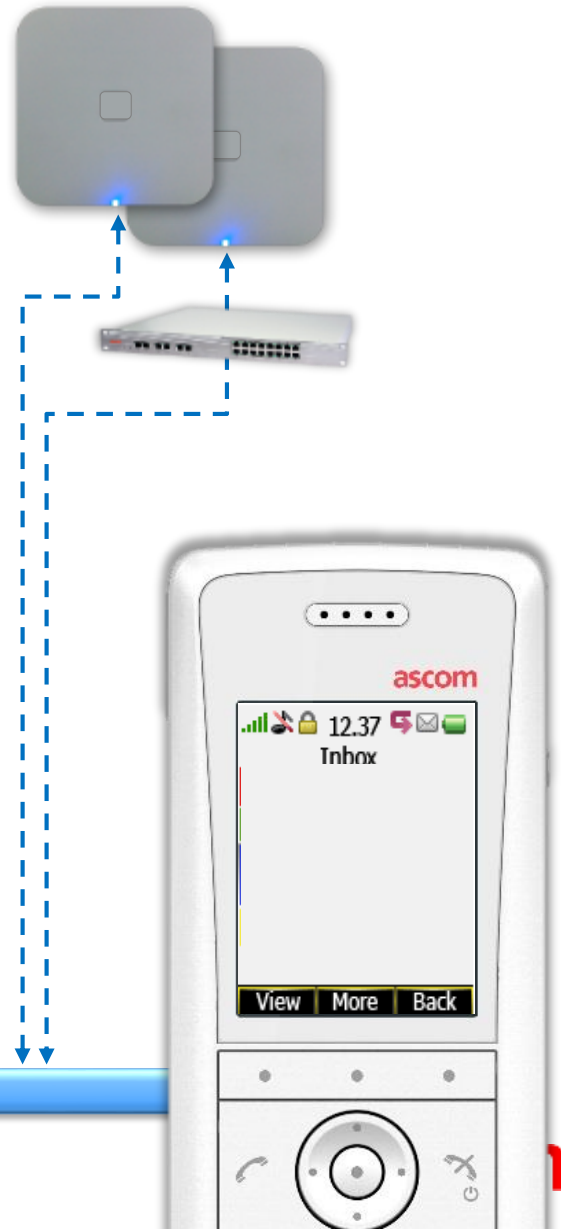
Connected systems can send alert messages with embedded response keys that trigger actions within the system.



Color-Coded Messages

Categorize messages and alerts for easy differentiation e.g. according to type or priority.

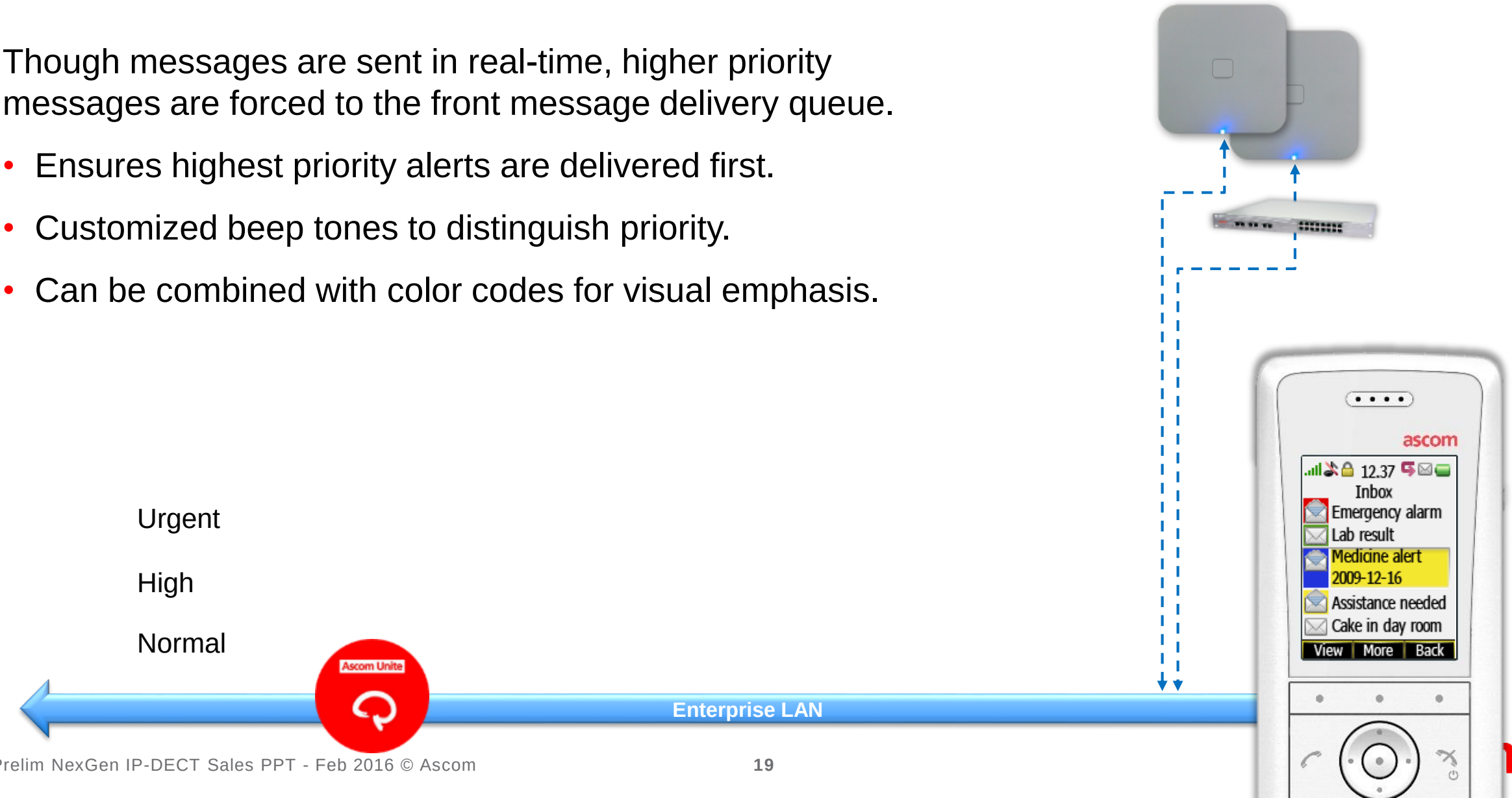
- Easily distinguish what's most important.
- Up to 8 distinct color labels.

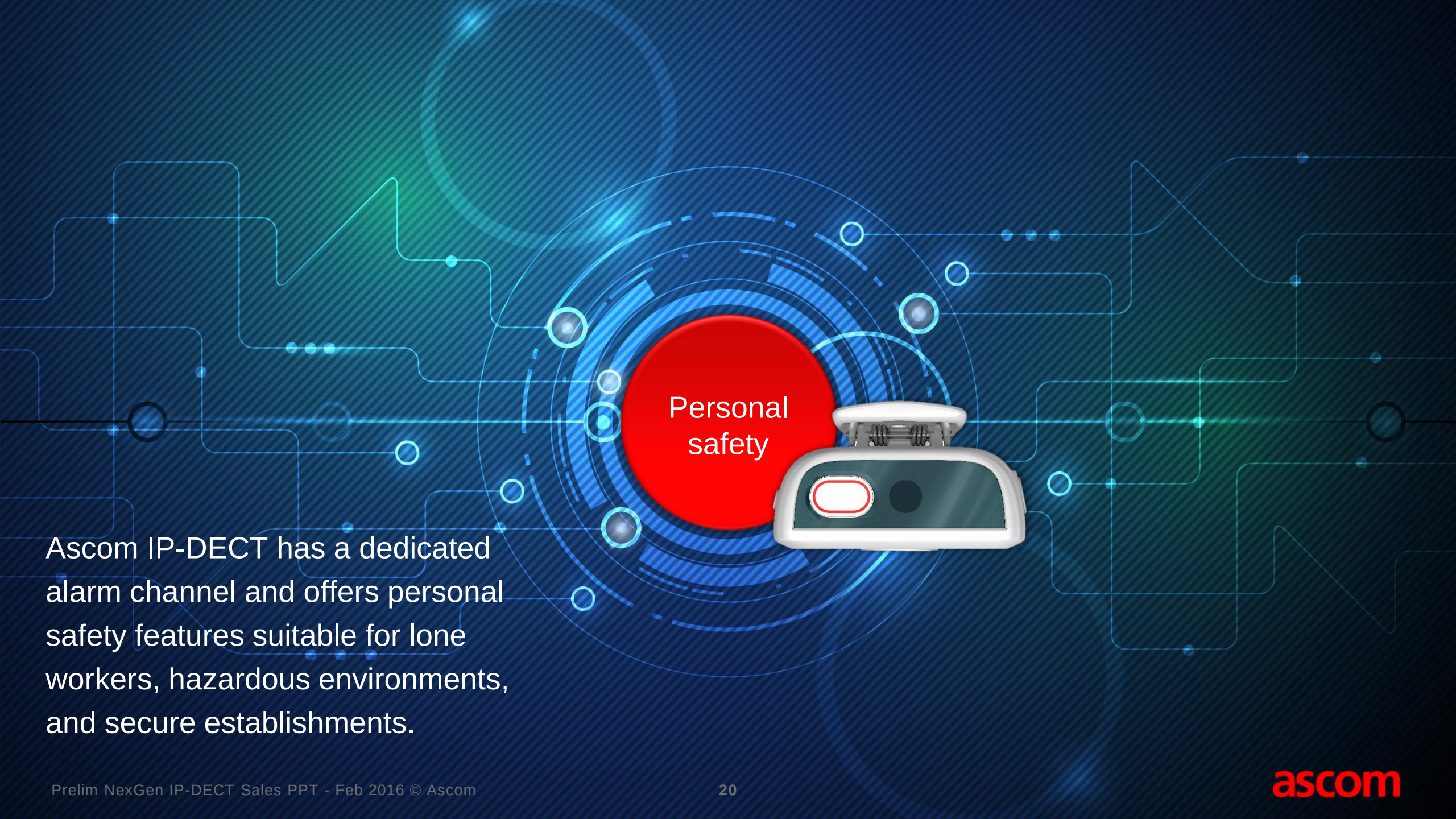


Prioritized Messaging

Though messages are sent in real-time, higher priority messages are forced to the front message delivery queue.

- Ensures highest priority alerts are delivered first.
- Customized beep tones to distinguish priority.
- Can be combined with color codes for visual emphasis.





Ascom IP-DECT has a dedicated alarm channel and offers personal safety features suitable for lone workers, hazardous environments, and secure establishments.

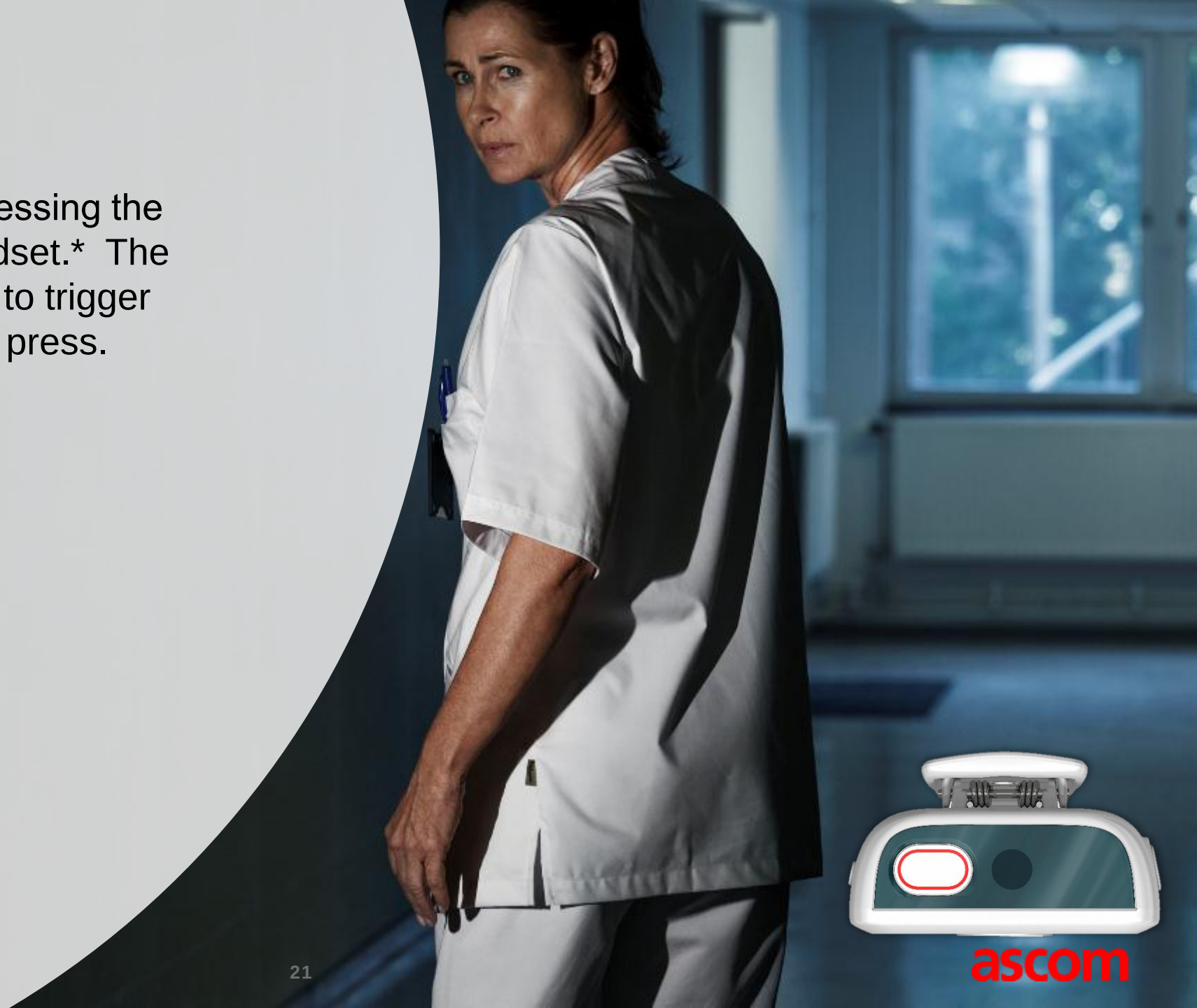
Alarm Button

A “duress” alarm triggered by pressing the multi-function button on the handset.* The button can also be programmed to trigger other events with long or double press.

Examples:

- Duress alarm
- Silent alarm
- Push-to-Talk

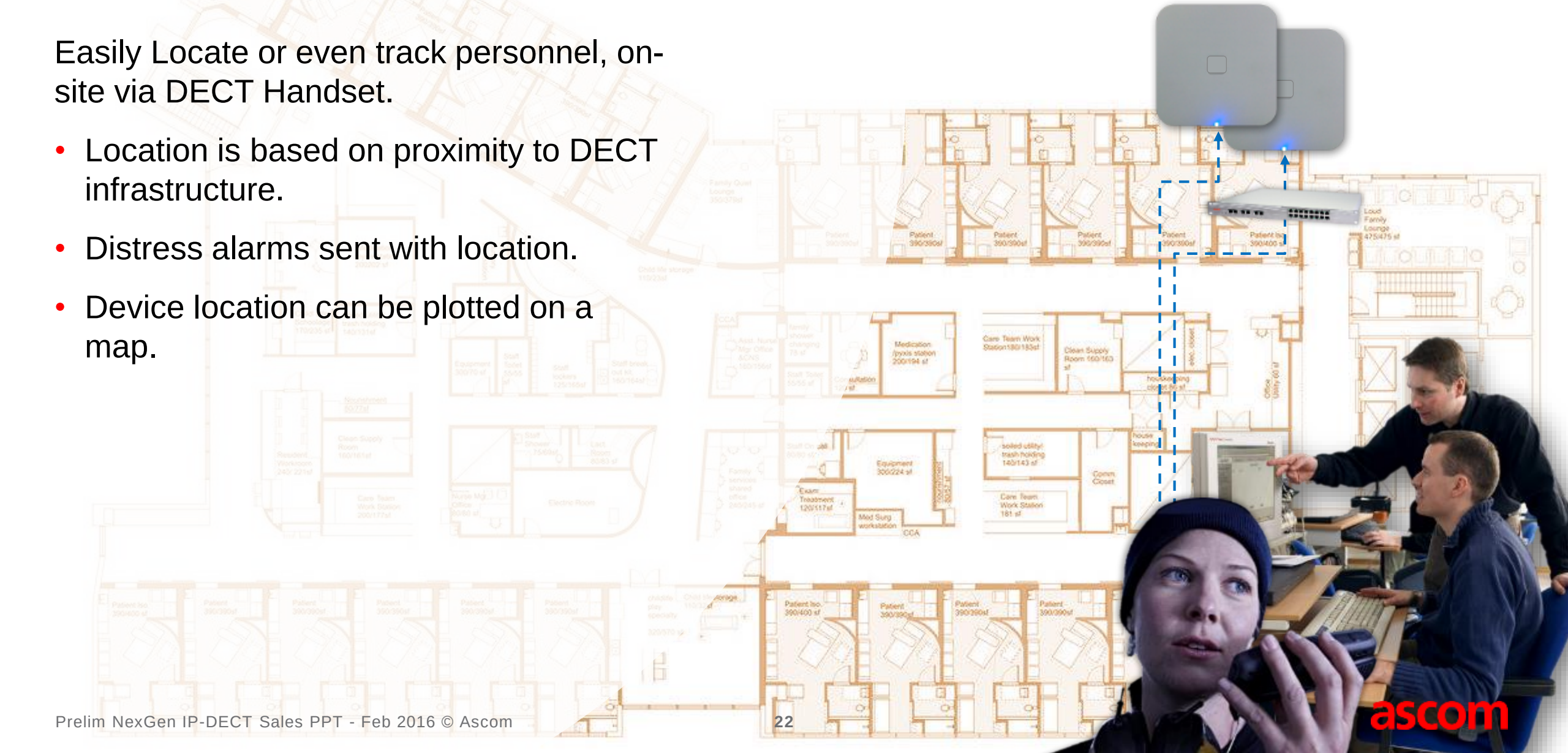
*Applies to d63



DECT – Indoor Location

Easily Locate or even track personnel, on-site via DECT Handset.

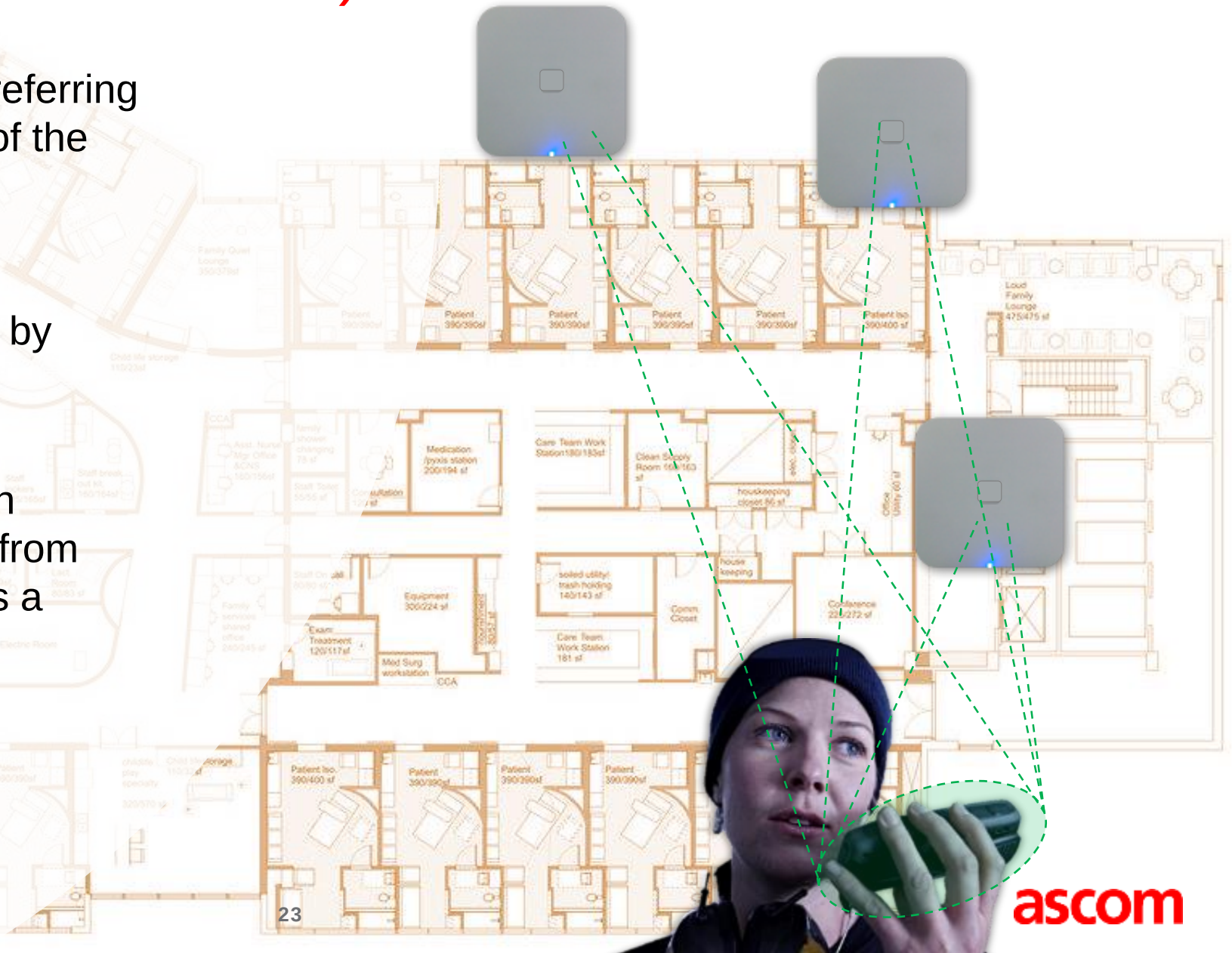
- Location is based on proximity to DECT infrastructure.
- Distress alarms sent with location.
- Device location can be plotted on a map.



DECT – Location (How it works)

Handset location is calculated by referring to location ID and signal strength of the associated base station.

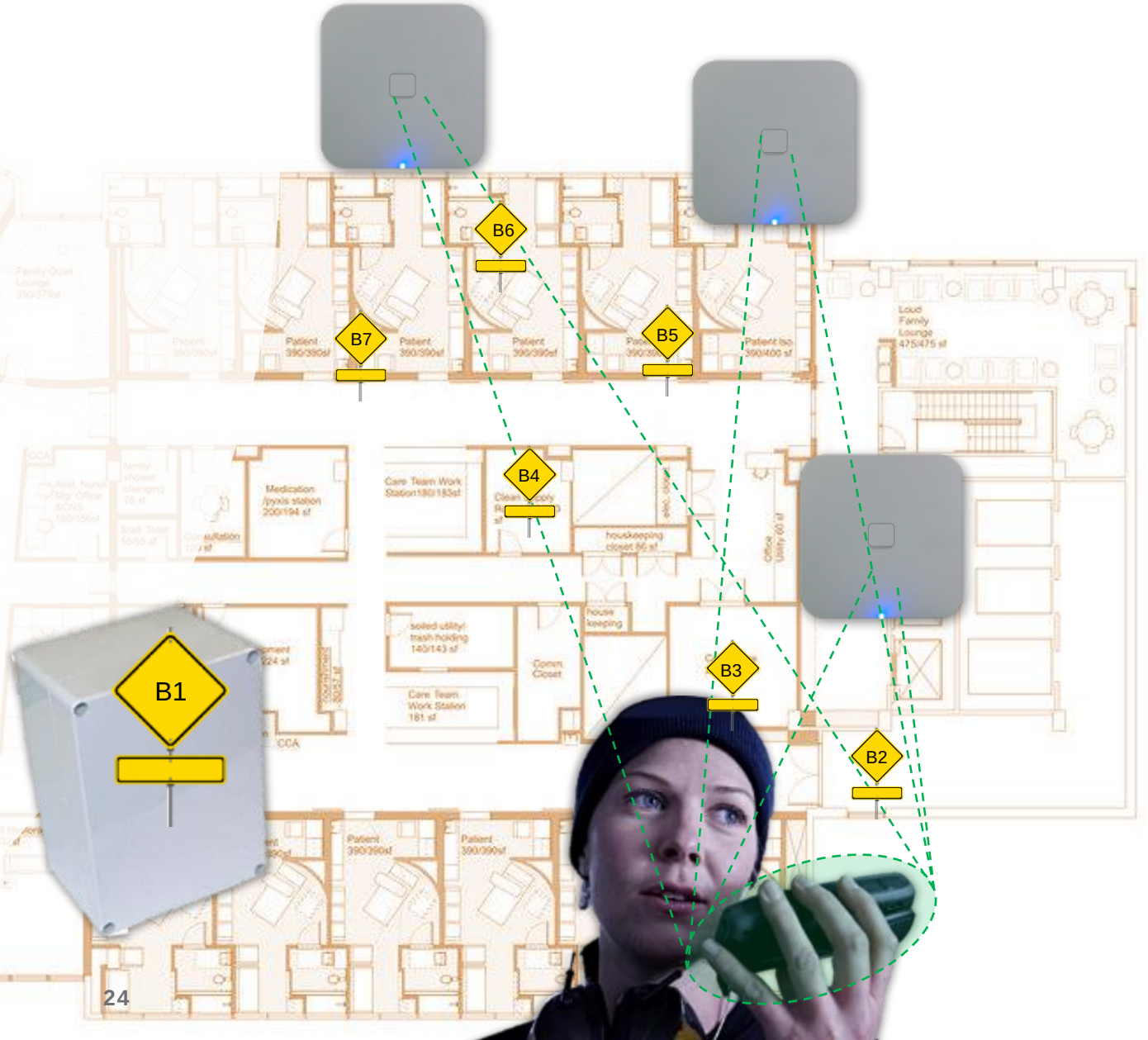
- Direction of movement is shown by referencing location IDs of last connected base stations.
- Alerts from handset are sent with current location ID, location IDs from previous two base stations , plus a timestamp.



DECT – Location with Beacons

Improve accuracy of DECT location by adding “beacons” (i.e. low powered DECT transmitters).

- Beacons have much shorter, adjustable, signal range than base stations, and are deployed more densely.
- Alerts are sent with current location ID, list of previous location IDs, plus a timestamp.



Push-to-Talk (PTT)

Walkie-talkie like functionality. Enables users to trigger a group call with a simple press of a button.

- Especially useful in noisy environments.
- Call groups are pre-defined.
- Loudspeaker mode is default.
- All mics muted to avoid background noise.
- User pushes PTT button to speak.

Push-to-Talk (How it works)

1. A user (or system event) starts a PTT session

2. All participants are invited to a group PTT session, including caller

3. All participants automatically connected via conference bridge.

Press PTT button to speak

Centralized Management

Ascom Unite provides adminstrative tools to configure and manage the complete Ascom IP-DECT system.

Supported features include:

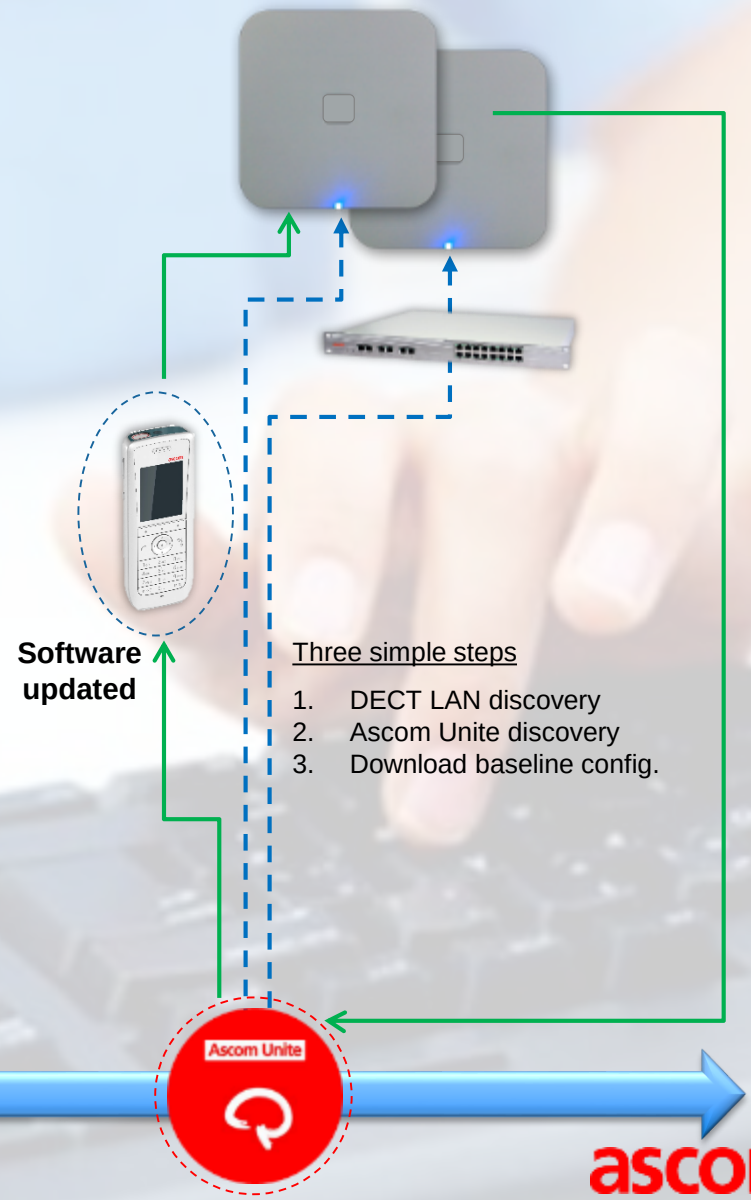
- Firmware updates
- Configuration of application settings
- Administration of licenses
- A single point of administration for all Ascom handsets

Easy Registration

Simplifies deployment of new handsets to existing installations.

<u>Benefits</u>:

- Completely Over-the-Air (OTA).
- No need to configure each handset manually.
- Perfect for large handset deployments.
- Quick & easy.



Shared Phone

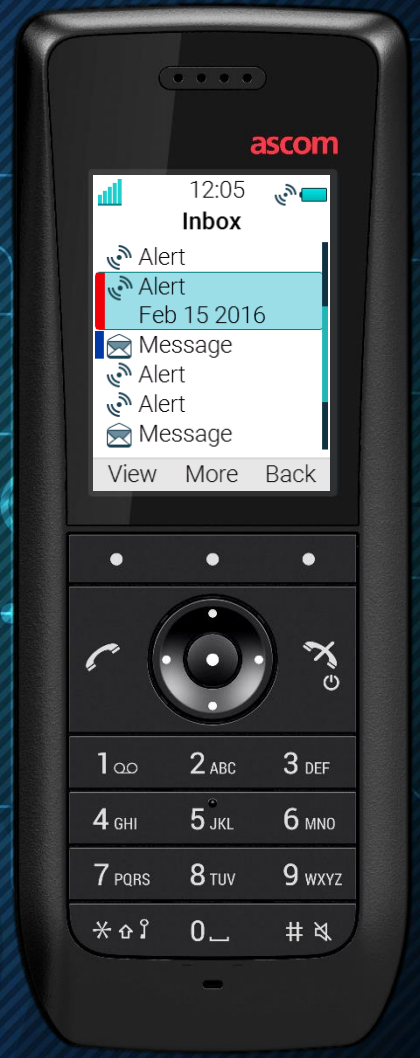
Reduce total cost of ownership.

Perfect solution where total number staff far exceeds staff on shift.

Benefits:

- Login to any *“Shared Phone” (handset)*, keep Ext.
- Best use of limited resources

Information security



Ascom IP-DECT: Information Security

The 3 – Pillars of Information Security

1. Confidentiality:

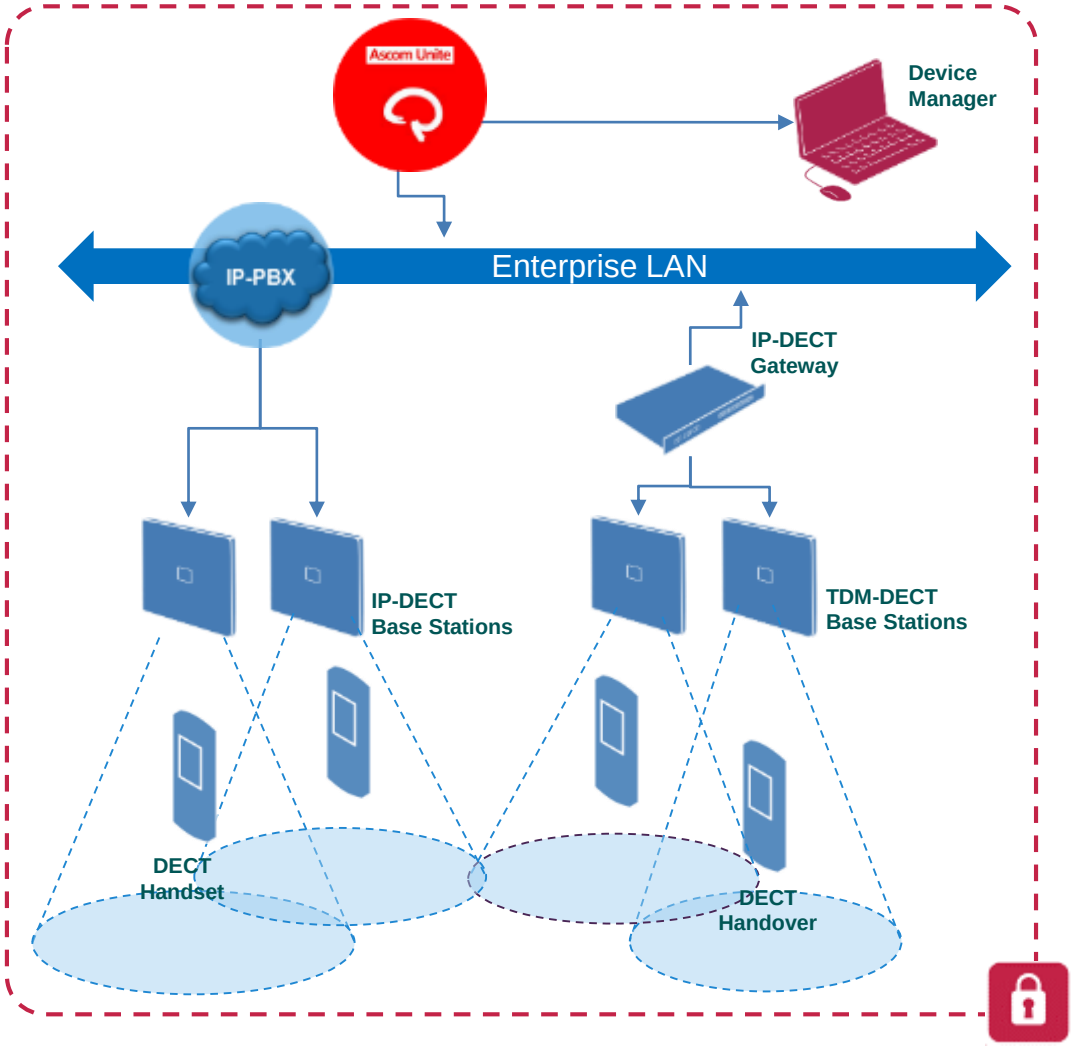
Ensuring only those authorized to specific information are granted access. So all messages and voice communications must be encrypted.

2. Integrity:

Prevent unauthorized data modification during transmission, or ensure such modification can always be detected.

3. Availability:

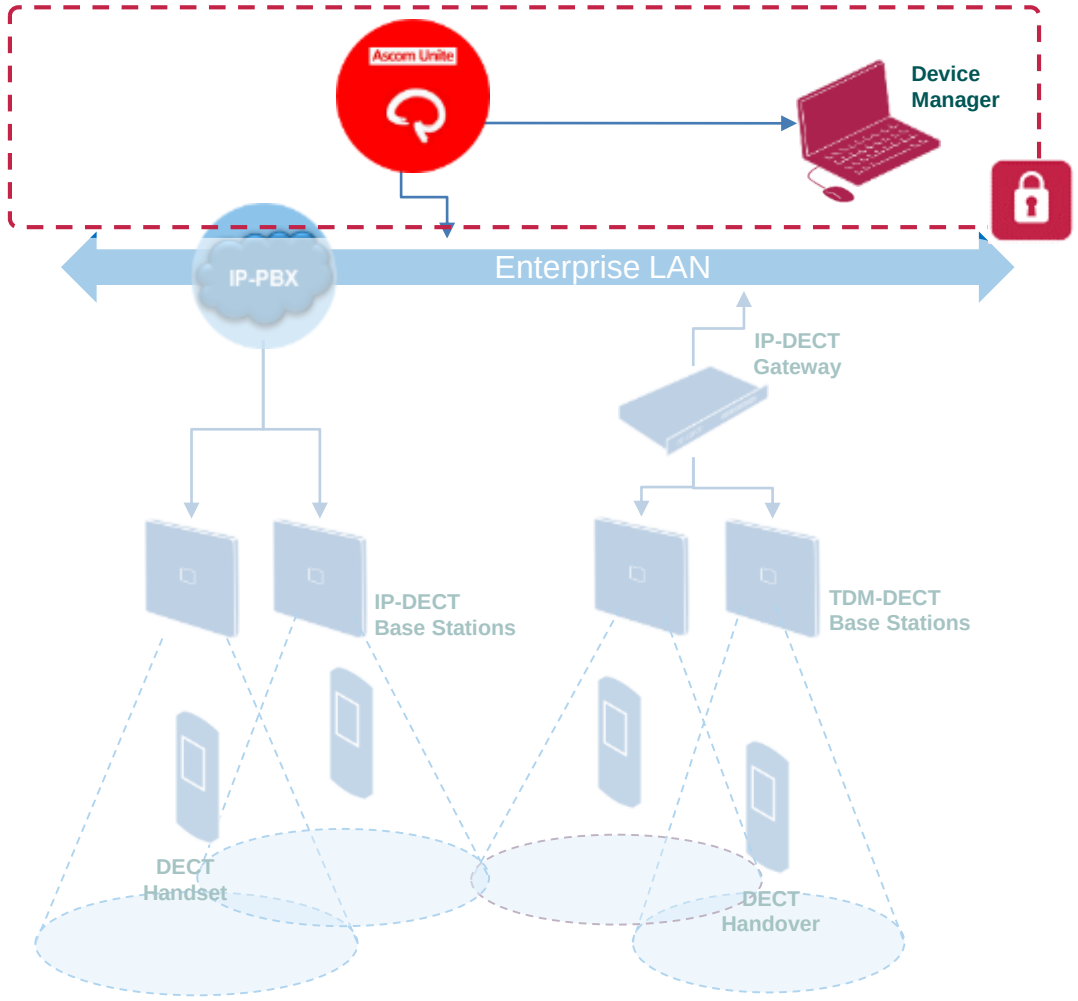
Actively preventing loss of service by incorporating system redundancy, fault tolerance and resilience. Also ensuring system uptime.



Ascom IP-DECT: Information Security

Secure device administration over IP

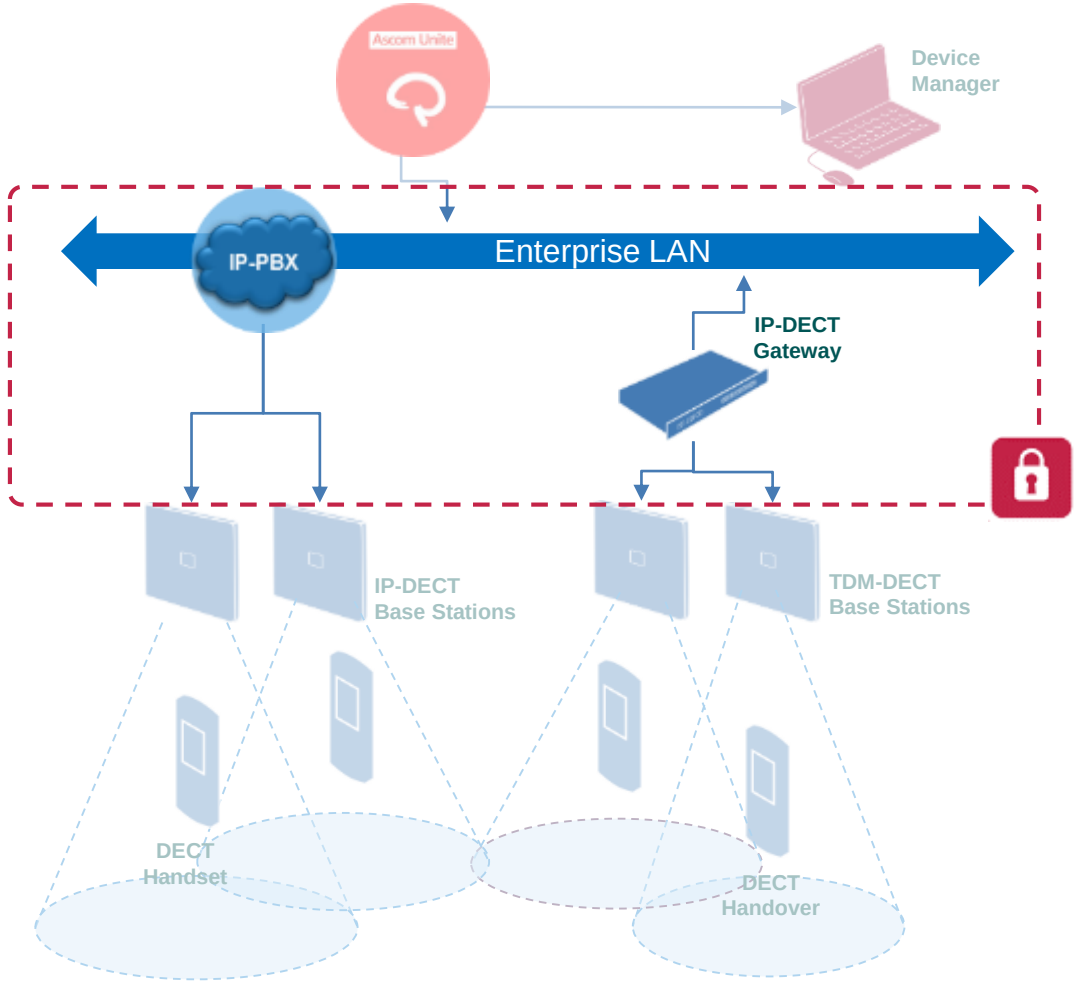
- Ensures only authorized users can administrate the system
- Maintains system integrity by preventing unauthorized access.
- Provides audit trial for traceability.



Ascom IP-DECT: Information Security

Secure IP telephony

- Provides data security over IP network.
- All information exchange is encrypted.



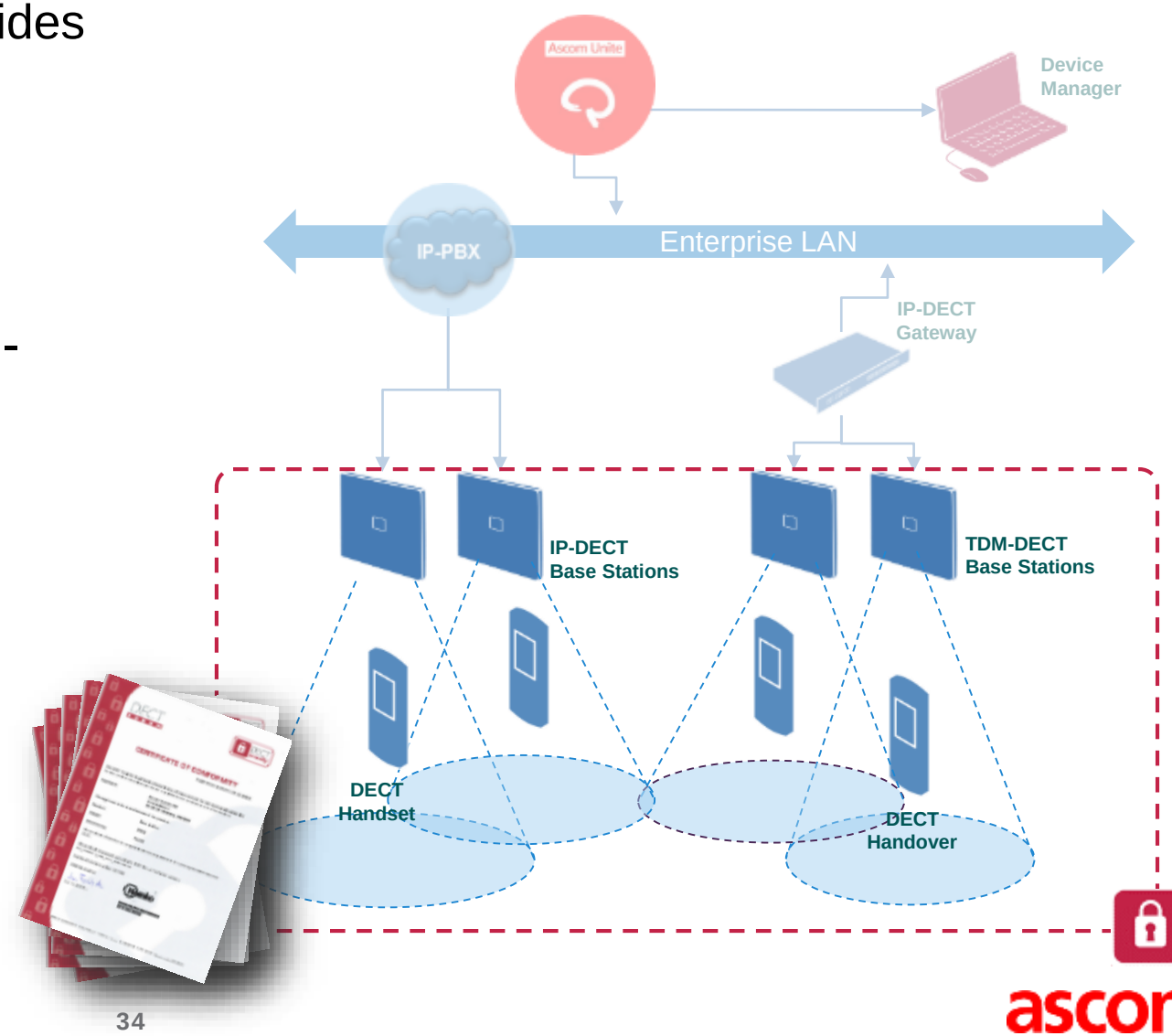
Ascom IP-DECT: Information Security

•**Secure "over-the-air" transmission** Provides information security over the DECT radio channel.

- All information exchange is encrypted.

Conformance with EN300 444 Feature N35 - DECT Forum

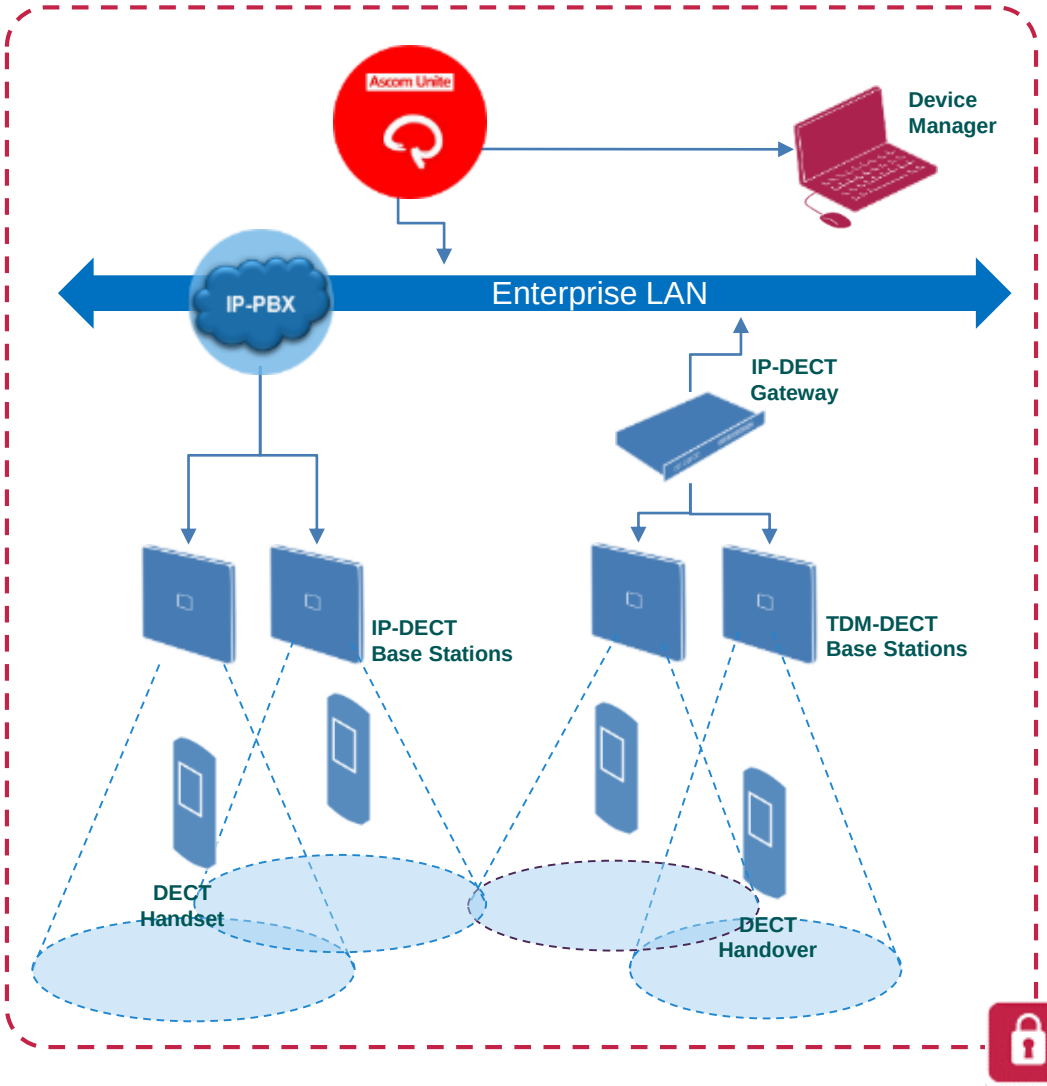
- Early encryption.
- Re-Keying during calls.



Ascom IP-DECT: Information Security

System Redundancy

All system components support “fail-over” i.e., backup devices can be configured to takeover if the primary fails.



Technical Information

Systems Architecture

Scalability

Ascom IP-DECT system is highly scalable.

A simple installation could consist of a single base station with some handsets. This can be grown in two ways:

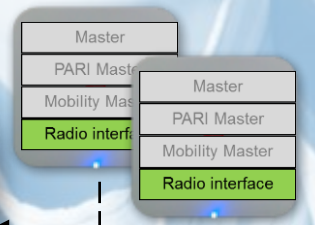
1. **User capacity** – add more base stations (and handsets) to increase capacity for simultenuous calls.*
2. **Geographically** – add more base stations to increase coverage area.

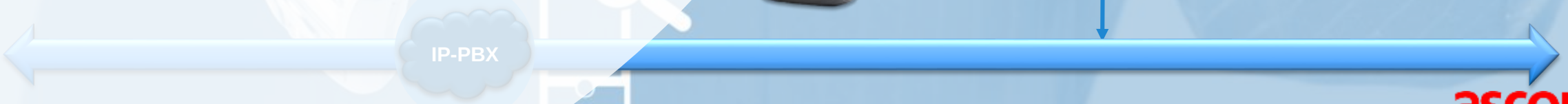
*Each base station can handle up to 8 simultenuous calls.

Ascom IP-DECT: Increasing Capacity

To increase capacity for simultaneous calls, add base stations* within existing coverage area.

* Only the radio interface is enabled on additional base stations





Ascom IP-DECT: Increasing Coverage

To increase coverage (geographically), add base stations* to new coverage area(s).

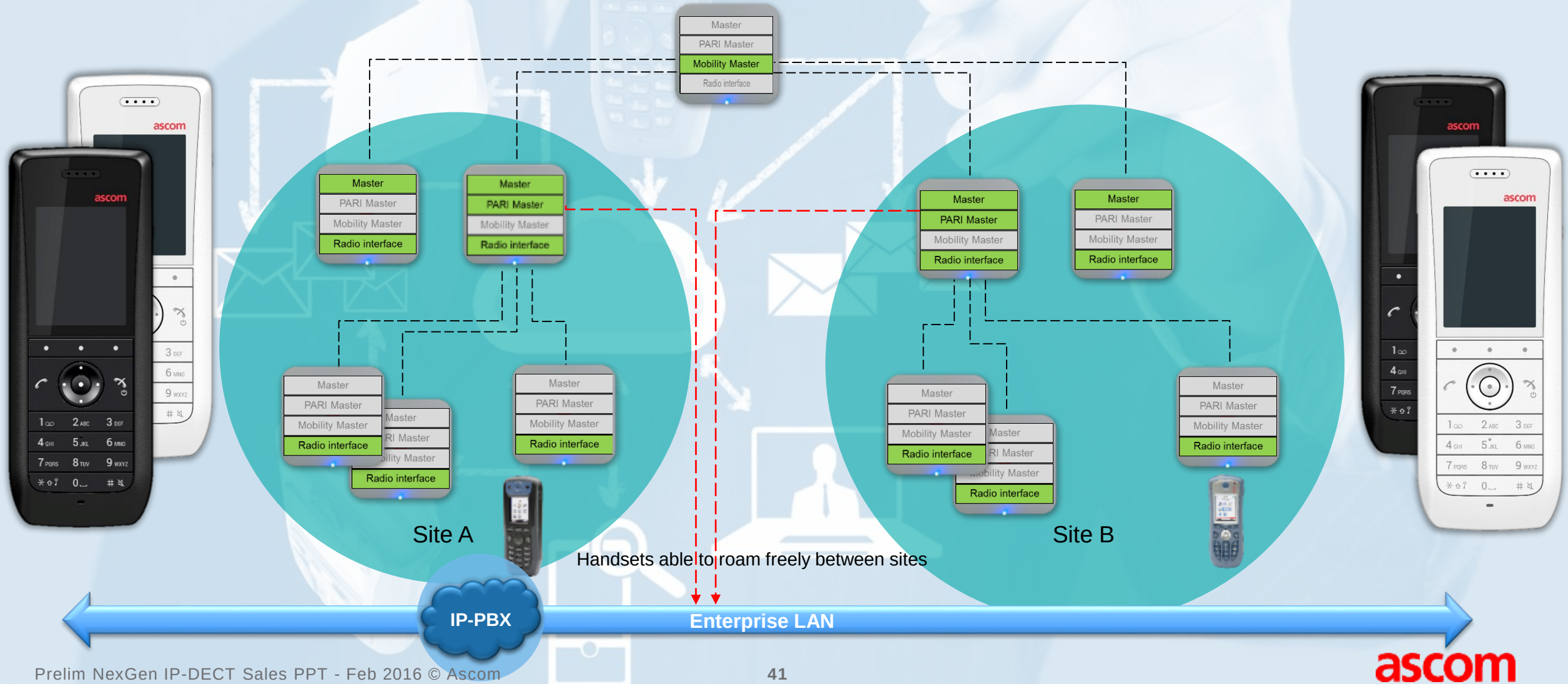
* Only the radio interface is enabled on additional base stations

Multi-Master Systems

Each multiple of 1,000 users requires a new master to be enabled. A user always belongs to a single master.

A Mobility Master is required to keep track of which users belong to which Master.

Multi-Site Systems



International Multi-site Systems

Ascom IP-DECT can be grown to over 10,000 base stations and handles up to 100,000 users.

The entire system supports enterprise grade telephony and interactive messaging, and can be managed centrally via Ascom Device Manager.

Multi-sites can be spread internationally with support for multiple PBX vendors with different connectivity requirements.

Interoperability

ascom

Ascom Interoperability Program

PURPOSE

To verify, validate and certify true Interoperability between Ascom products and products from other vendors. Ascom Certified Interoperability guarantees peace of mind; it ensures trouble-free deployment and use of Ascom products in combination with certified products from other vendors.

VALUE & BENEFITS

Testimony – No Guesswork: Jointly attested functionality, performance, and limitation of multi-vendor solutions creates transparency, provides confidence and ensures customer value.

Cost-effectiveness – Ensures trouble-free deployment and eliminates need for functional testing at customer sites.

Assurance – Ascom works continuously in close collaboration with technology partners to maintain interoperability of co-certified products.

DELIVERABLES

Documented interoperability reports. Jointly attested list of supported features, configuration guidelines, and limitations for both Ascom and partner products.

Full customer support for Ascom products as a part(s) of a multi-vendor solution.

Open Standards ≠ Interoperability

Interoperability:

"Products from different vendors working together as functional parts of a whole system or solution."

Open standards:

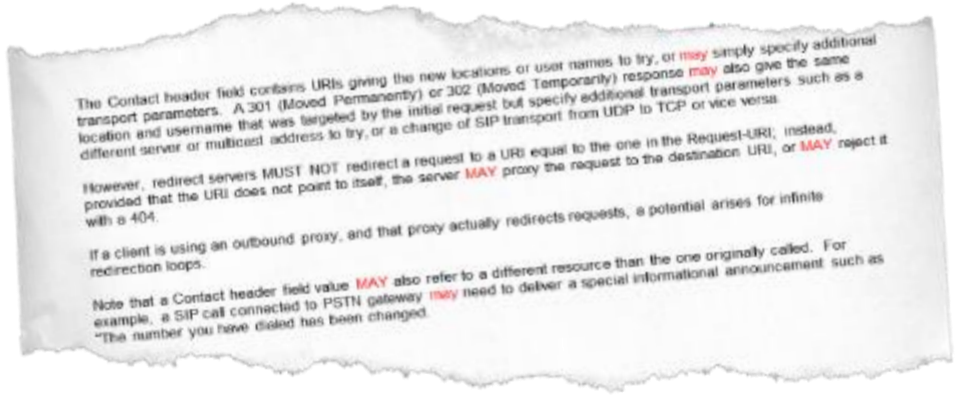
"Public (common) standards that facilitate interoperability between products from different vendors."

Why is it so hard to achieve true interoperability?

The answer is less related to technology, than how standards are actually developed.

- Specifications are drafted by large committees
- Difficult to get consensus on specifics.
- Development process ends up trying to fulfill "everything to everyone"

A word count in RFC 3261 (SIP specification) yields interesting insight of how weak procedural terminology in an open standard might be interpreted differently by different vendors.



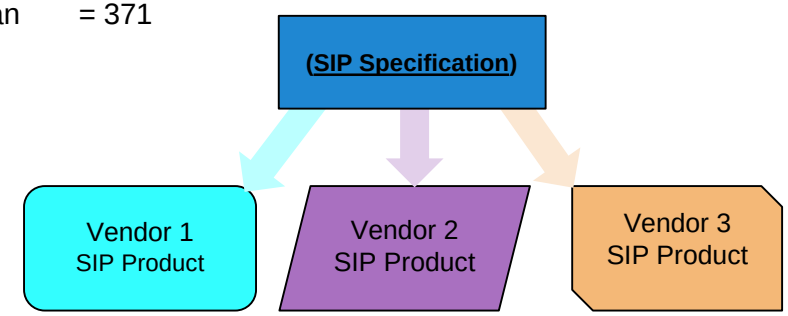
The Contact header field contains URIs giving the new locations or user names to try, or may simply specify additional transport parameters. A 301 (Moved Permanently) or 302 (Moved Temporarily) response may also give the same location and username that was targeted by the initial request but specify additional transport parameters such as a different server or multicast address to try, or a change of SIP transport from UDP to TCP or vice versa.

However, redirect servers MUST NOT redirect a request to a URI equal to the one in the Request-URI; instead, provided that the URI does not point to itself, the server MAY proxy the request to the destination URI, or MAY reject it with a 404.

If a client is using an outbound proxy, and that proxy actually redirects requests, a potential arises for infinite redirection loops.

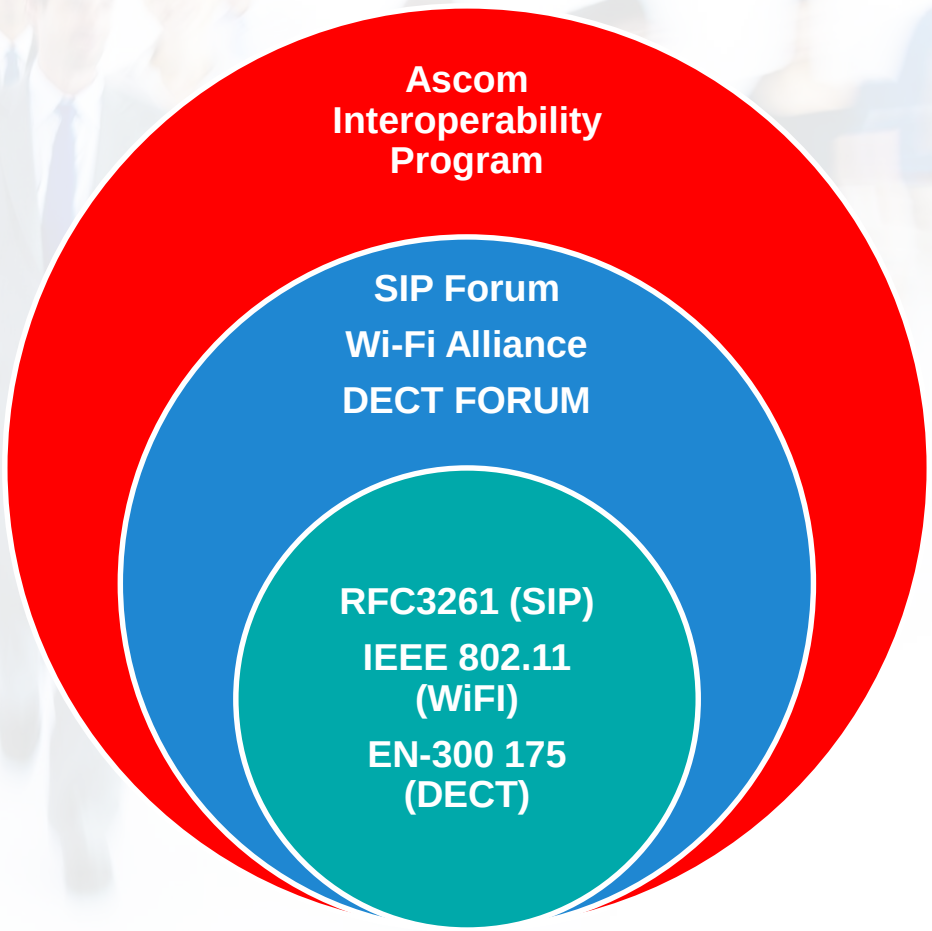
Note that a Contact header field value MAY also refer to a different resource than the one originally called. For example, a SIP call connected to PSTN gateway may need to deliver a special informational announcement such as "The number you have dialed has been changed."

Weak		Strong	
May	= 424	Shall	= 4
Should	= 344	Must	= 631
Option	= 104		
Can	= 371		



Ascom Interoperability Approach

- Multi-vendor ongoing cooperation & application focus
- “De-facto” standards & Industry certifications
- Technology Requirements & Industry Standards



The Ascom Interoperability Program

- Proactive approach – mutually verifies, validates, and certifies Ascom products in close collaboration with technology partners.
- Focused on mitigating interoperability issues, and building enhanced integrations to partner products.
- Ensures trouble-free deployment of Ascom products in combination with products from technology partners, to deliver even greater customer value.
- Provides jointly attested interoperability reports, listing supported functionality, configuration guidelines and limitations of multi-vendor solutions

Ascom Interoperability Approach

Our partners include most of the world's leading technology vendors. The Ascom Interoperability Program represents joint collaboration with technology partners to deliver world-class solutions with increased customer value.

Customer Cases

Volvo Car Corporation

Sweden

Swedish premium car manufacturer, headquartered in Gothenburg, Sweden.

Multi-site:	Yes
No. of sites:	xx
No. of handsets:	xx
Comments:	Telenor / Daxcom acts as operator

Challenges

Need to replace older DECT system (Siemens) used primarily for telephony that could not be expanded geographically. Required unified solution that allowed users to roam between multiple sites that could also be managed centrally (by Telenor/Daxcom).

Ascom offered

Ascom IP-DECT system

- Configured as “multi-site” supporting enterprise-grade telephony, messaging and alarm notification.

Ascom Unite Middleware

- Unite Messaging Suite®
- Integration to production alarms
- Ascom Device Manager

Value

Improved collaboration with better reachability

- Improved productivity with production alarms direct from production system
- Decreased cost for managing the system