



Simply Secure Connectivity

ULE (DECT) 及び ULE Allianceのご紹介



2014/5/28
DECT Forum Japan Working Group
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DECTについて



DECT = Digital Enhanced Cordless Telecommunications

ETSI (欧州電気通信標準化機構) が策定したデジタルコードレス電話規格で、欧米をはじめ世界中で広く採用されています

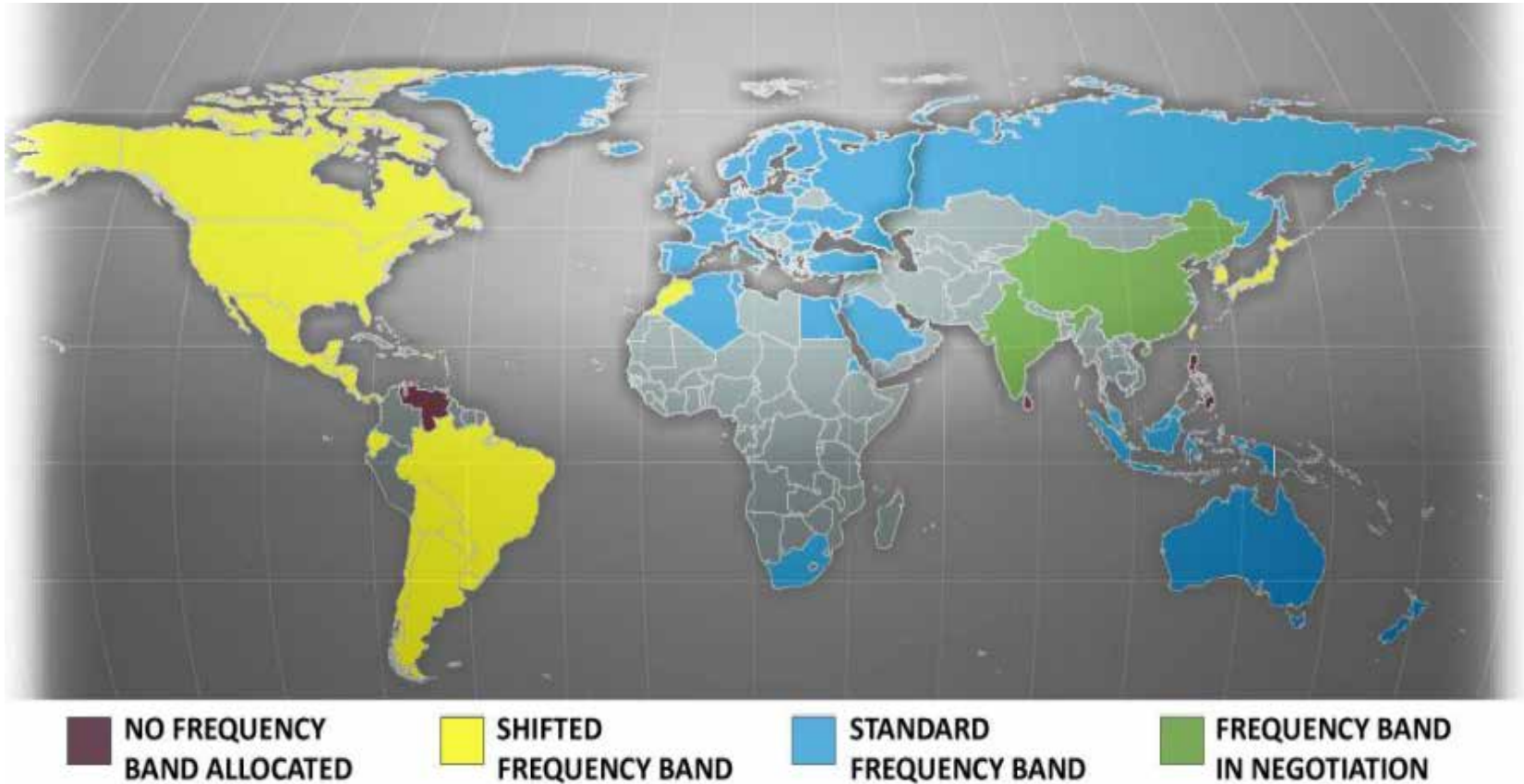
日本でも 2010年10月にデジタルコードレス電話の技術基準が改正され、利用できるようになりました

特徴

- 全世界で主に1.9GHz帯を使用し、電子レンジや無線LANなどの2.4GHz帯と干渉しない
- 音声/センサ・ライトデータ/低速ビデオ など、複数メディアの通信を1つの技術で実現可能
- チャンネル使用状況を常時モニタリングし、自動的に選択することで、効率良く帯域を利用
- 通話毎に認証と生成される暗号鍵による、高い通話秘匿性(チャレンジ&レスポンス方式)
- 見通しで300m以上、屋内でも数10mの広い到達距離、中継器による距離拡張も可能
- 世界中で年間数億個のデバイスが利用され、スケールメリットのあるコストでの製品化が可能
- 公衆通信網に接続されるDECT搭載の電話機やホームゲートウェイを介し、外部ネットワークのサービスや機器と、ホームネットワーク内の機器とを連携させることが可能



DECT & ULE – World-wide Coverage

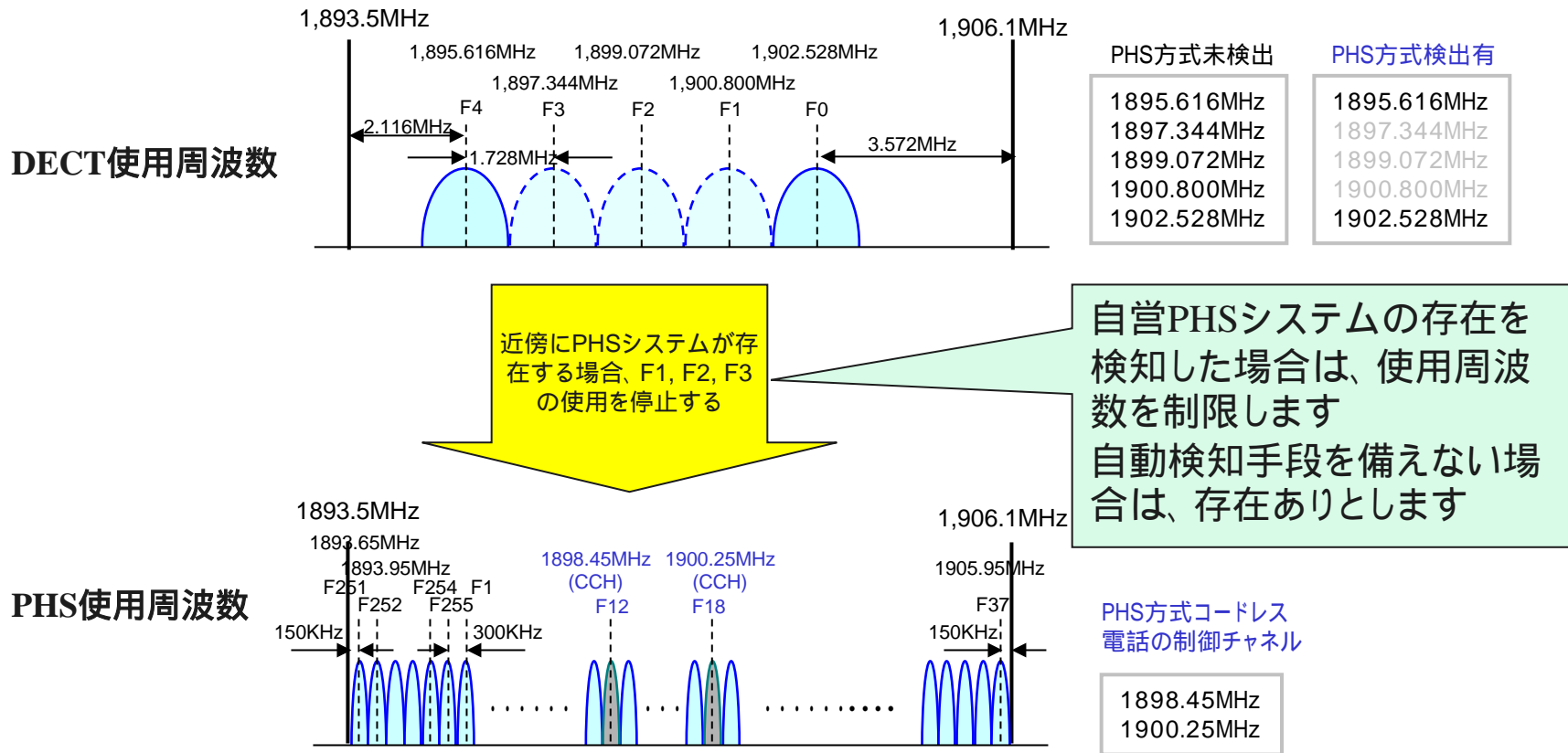


A Single Product Can Cover the Entire World



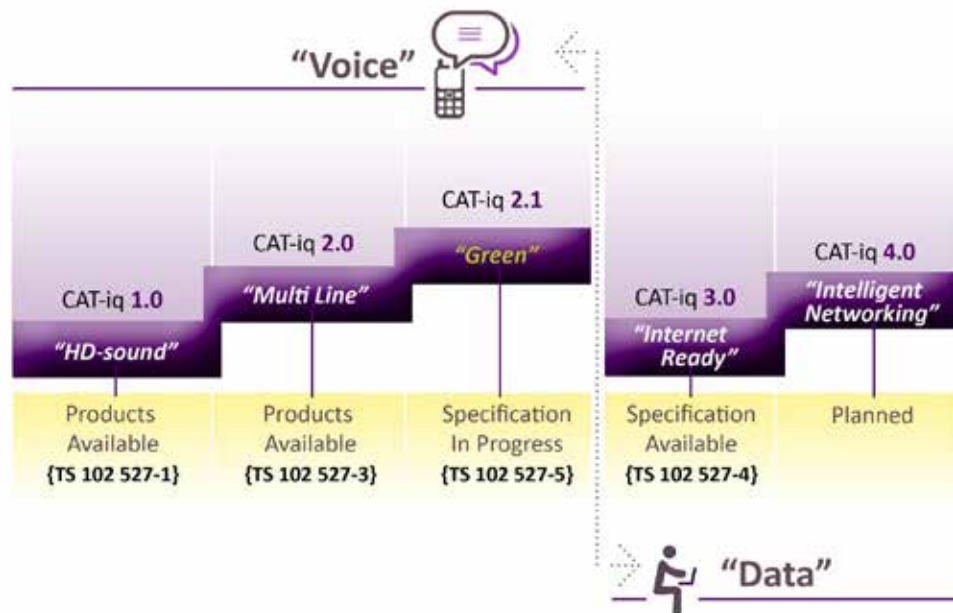
日本国内でのDECT規格

- 同一周波数帯域(1.9GHz)で運用される自営PHSシステムに対する保護機能を備え、PHSシステムの存在を検知した場合は、使用周波数が制限されます(5波->2波)



CAT-iq (次世代DECT)

- CAT-iq = “Cordless Advance Technology, Internet & Quality”
次世代DECT方式として DECT Forumにより策定・登録され、ETSIにより規格化されました
- DECT GAP(Generic Access Profile)方式との後方互換性を含む対応機器間の機能互換性を保証します
- 対応機器間では G.722による高品質(広帯域)音声通話や データ通信機能を持った製品を実現します
- 欧州を中心に CAT-iq 対応のホームゲートウェイや端末が多数利用されており、対応機器は認証ロゴを使用することができます
- GSMA(GSM Association)との合意により、CAT-iq 2.0以上の対応機器にはHD-Voice のロゴを使用できるようになりました



* Note that some data devices may incorporate voice services

ULEとは?



- | ULE = Ultra Low Energy の略称です
- | 物理層にDECTを利用し、一次電池駆動で超低消費電力用途を目指した方式です
- | コンセントレータとデバイスで構成されるシンプルな構成を採用しています
- | 図に示す3つのアプリケーションセグメントにフォーカスしており、HAN FUN (Home Area Network FUNctional) アプリケーションレイヤが規定されました

< 特長を生かせる適用分野 >

- ÿ ホームコントロール
- ÿ セキュリティ&セーフティ
- ÿ スマートエナジ/スマートグリッド
- ÿ ヘルスケア/テレケア など



•他技術との比較

Parameters	DECT ULE	Zigbee	Bluetooth LE
Range (outdoors)	300m	70m	10m
Data rate	1.152 Mbps	250 kbps	1 Mbps
Link Budget	117 dB	101 dB	97 dB
Sensitivity	-93 dBm	-97 dBm	-93 dBm
Transmit power	24 dBm	4 dBm	4 dBm
Encryption	DSAA/DSAA2(AES-128)	32bit to 128bit AES	AES-128
Frequency Band	1.9GHz (Reserved band)	2.4GHz (ISM band)	2.4GHz (ISM band)



ULEの特徴 – サマリー



| オープンスタンダード技術

○世界110以上の国や地域で電波干渉の少ないDECT割当帯域を利用できます

○以下の標準規格が適用されます

○物理レイヤ:ETSI EN 300 175 シリーズ (DECT)

○トランスポートレイヤ:ETSI TS 102 939-1

○HAN FUNアプリケーションレイヤ:ULE Alliance web より入手可

○世界中で年間数億個出荷されるDECTデバイスを利用でき、スケールメリットのあるコストでの製品化が可能です

| 展開・サポートが容易

○音声 / センサ・ライトデータ / 低速ビデオ等の通信を1つの技術で実現可能です

○実用上十分なロングレンジ(見通し300m以上、屋内で数10m)をカバーできます

○シンプルなスター / ツリー型のネットワークポロジで、セル設計も不要です

○DECT搭載の電話機やホームゲートウェイをハブとして公衆網に接続できます

| 超低消費電力・ローレイテンシ

○スタンバイ状態では、マイクロアンペアオーダーの低電流で動作します

○単三電池2本で、非同期モード(トリガイベント起動)で最大10年、同期モード(間欠起動)で最大2年といった電池寿命を実現できます

○同期モードでは起動後 数10ms、非同期モードでも数100msオーダーで通信を完了します



Harnessing Technologies to Make Our Lives Better

Mega Trends vs.
User Experience

Automation



Climate Control



Security



ULE Technology – Focused on Our Homes and Buildings



ULE – Market Use Cases

- **Home Automation**



- Smart plugs
- Consumption display/awareness
- Lighting control
- Remote metering
 - Electricity, Gas, Water
- White goods/appliance control
- In-home control displays

- **Security:**



- Door phone
- Security camera
- Door/Window lock sensors
- Motion detector
- Glass Break detector
- Smoke/Fire alert
- Baby monitors
- Remote control
- Control station

- **Climate Control**



- Thermostat/Heating
- Ventilation
- Air Conditioning
- Blinds
- Display and Monitoring

The Challenge

A fast growing market of wireless control for homes and buildings

Automation



Climate Control



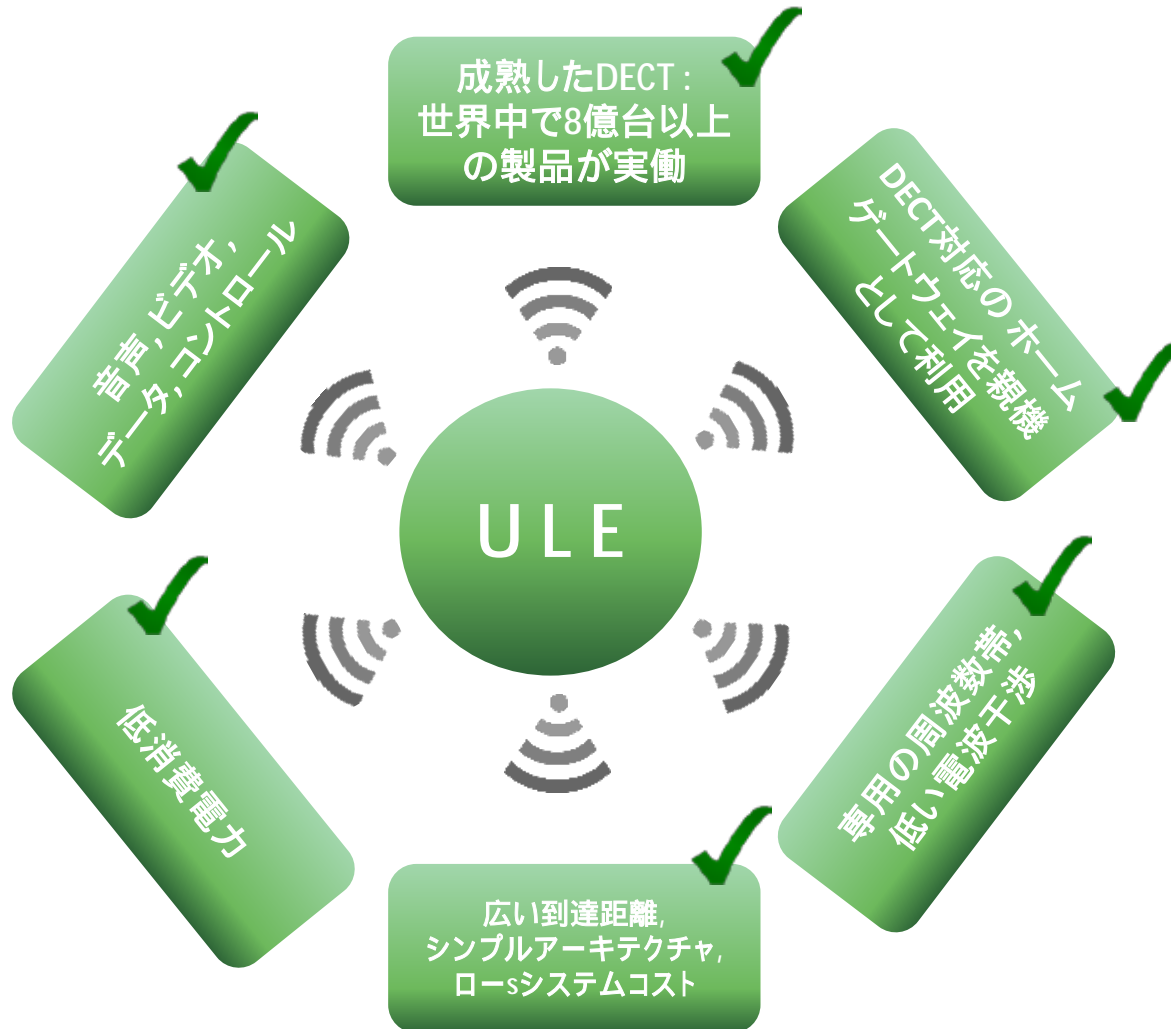
Security



Challenges of the existing solutions

- Shared frequency spectrum => **Interference**
- Range, Architecture => **Complexity, Cost**
- Behind the "smartphone/tablet era" => **No voice, video, ...**

ULE Technology Addressing the Challenges



ETSI Standard
ETSI TS 102 939-1
2013年4月にリリース

The Best Wireless Technology for Home Automation, Security, Climate Control and More...



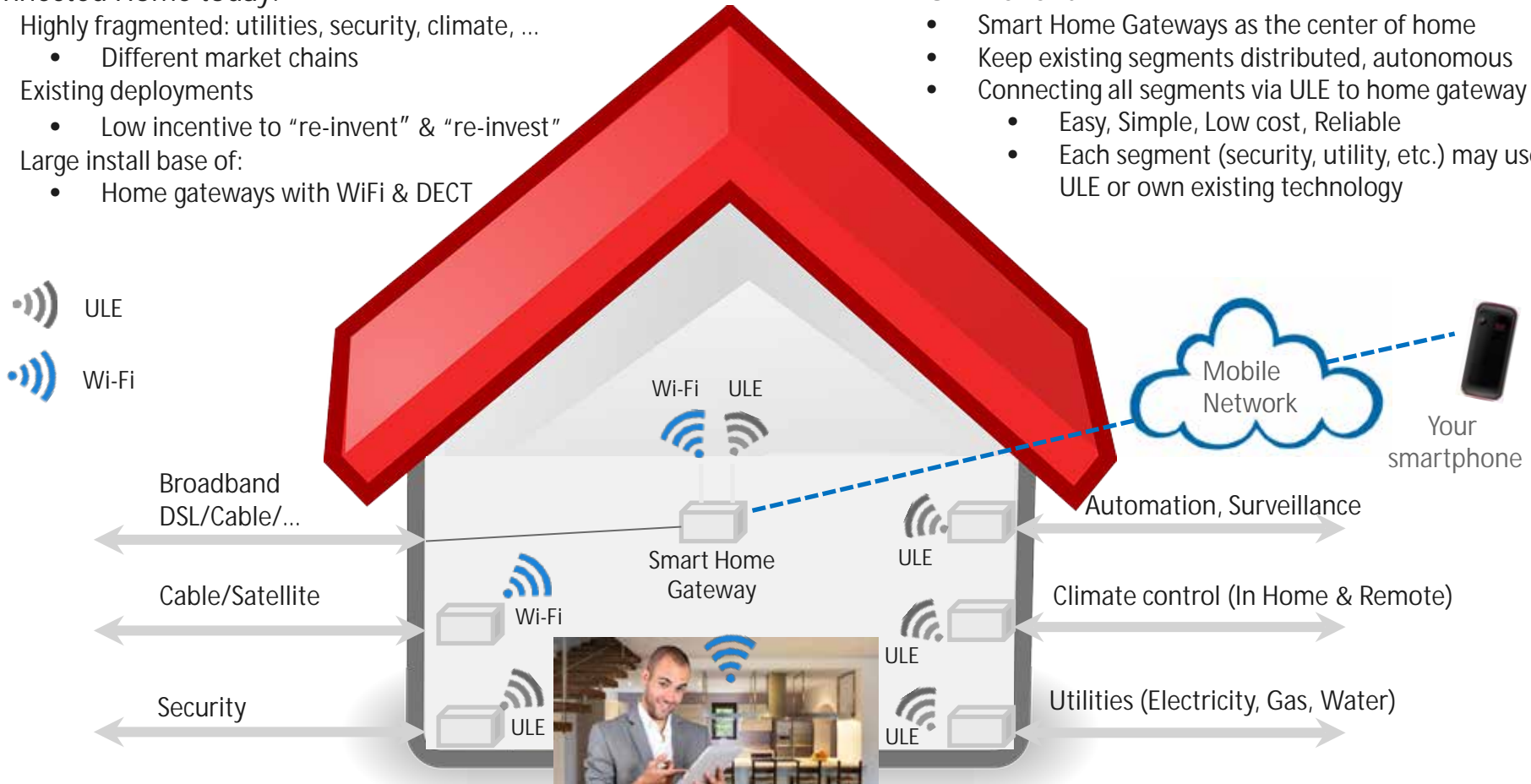
ULE – Smart Home Gateways ... and Respecting Eco-system

Connected Home today:

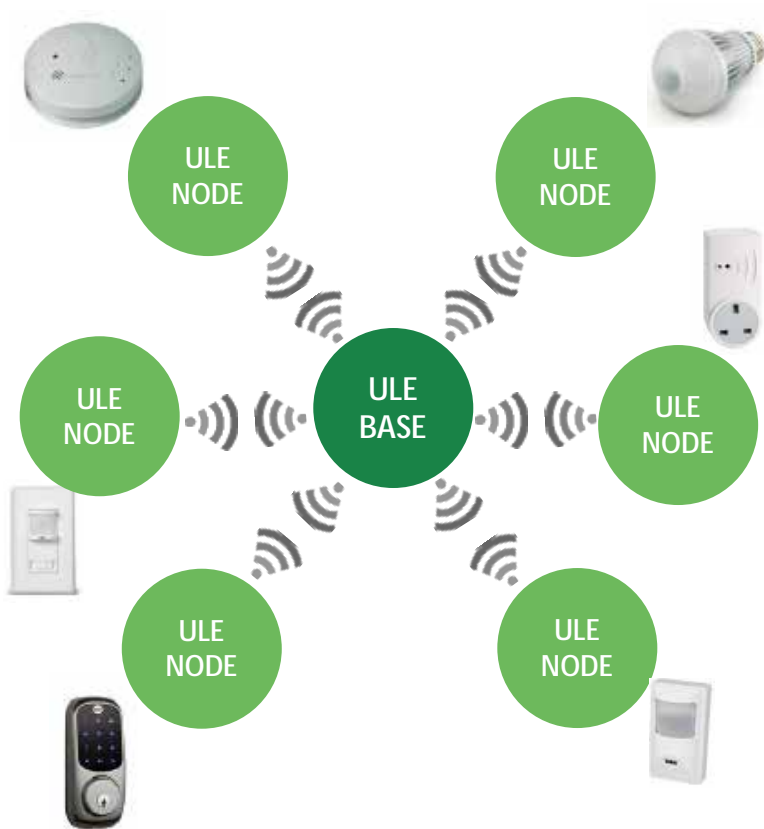
- Highly fragmented: utilities, security, climate, ...
 - Different market chains
- Existing deployments
 - Low incentive to “re-invent” & “re-invest”
- Large install base of:
 - Home gateways with WiFi & DECT

ULE Benefit:

- Smart Home Gateways as the center of home
- Keep existing segments distributed, autonomous
- Connecting all segments via ULE to home gateway
 - Easy, Simple, Low cost, Reliable
 - Each segment (security, utility, etc.) may use ULE or own existing technology



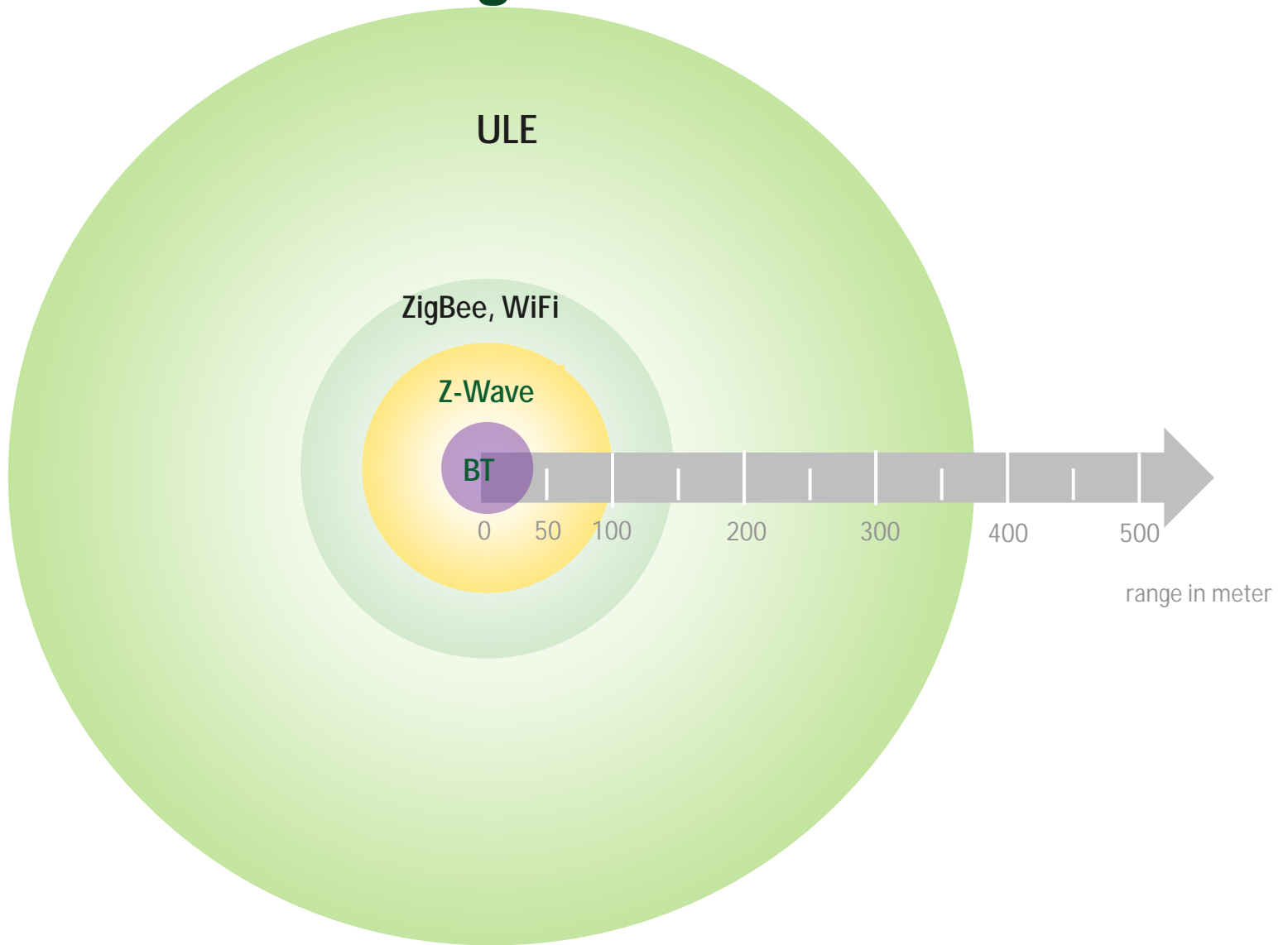
ULE Network Architecture



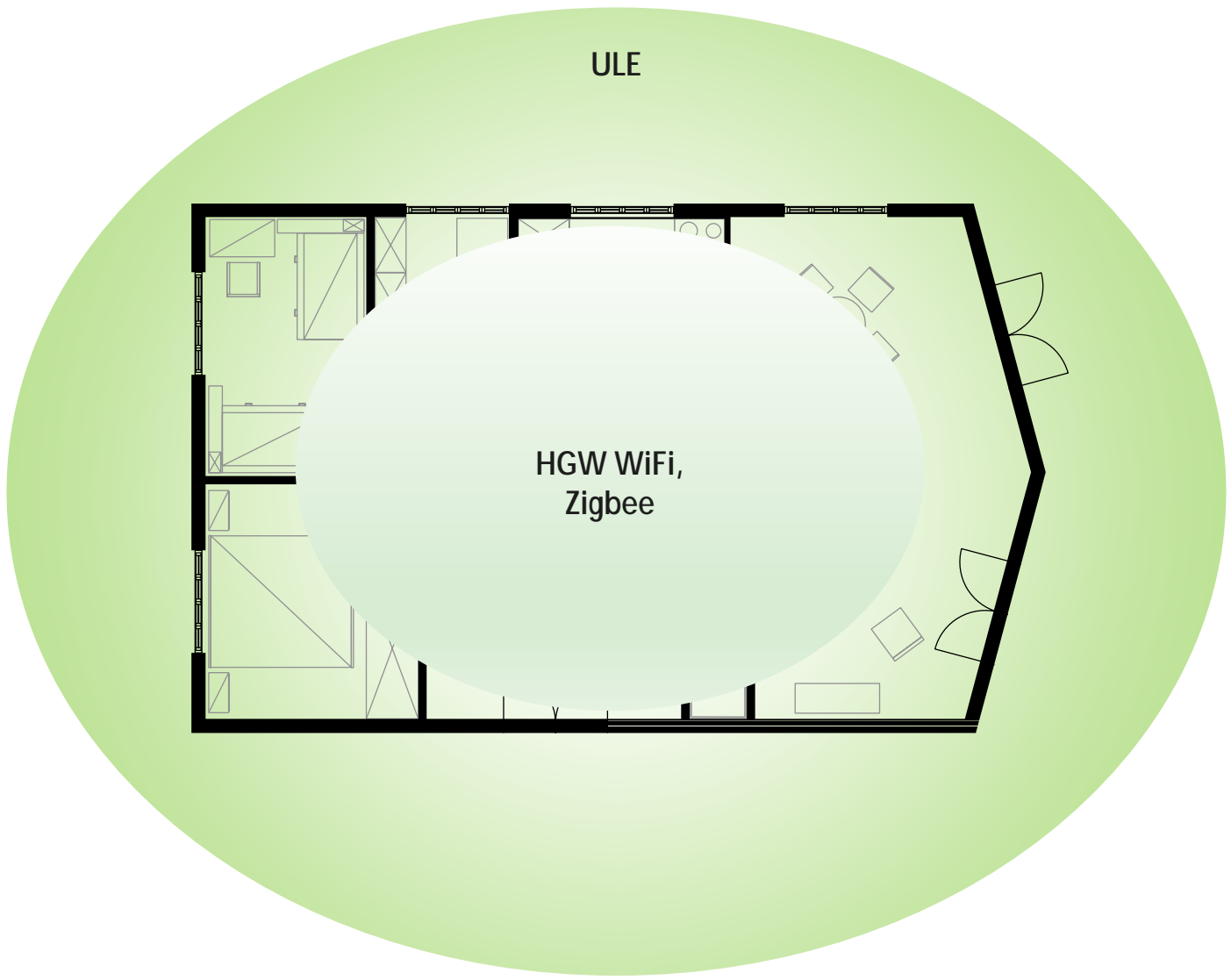
Basic ULE Network

- Star topology: one base + multiple nodes
- Long range, interference free
- Dynamic channel allocation
- Collision avoidance algorithm in each node
 - Thousands of nodes per base
- More complex network may use multiple bases and/or range extenders (repeaters)
 - DECT experience: repeaters < 1%

Superior Outdoor Range



Better Indoor Coverage



広い到達距離 – ULEの利点

ULE:
屋内で50m以上
屋外で300m以上

例：親機とノードが30m離れてい

レンジ - 30 meters

- シンプル
- リライアブル
- コストエフェクティブ

他の "10m range" 技術

10 meters

10 meters

10 meters

AC 駆動による中継器

AC 駆動による中継器



ULE – バッテリーライフ

- Battery Lifetime (*):

Mode	Sleep time	Battery Life
Asynchronous (unlocked)	5-6 minutes	~10 years
Asynchronous (unlocked)	2.5 minutes	~ 5 years
Synchronous (locked)	2 seconds	~ 2 years

* 2 AA batteries

Asynchronous – no immediate response required on requests from base (e.g. smoke sensor)

Synchronous – fast response required (e.g. remote control activated device)

ULE Alliance Activities 2013 - Focus Areas

- ULE Standardization
- Certification Program
- Membership expansion
- ULE promotion
- Liaisons

ULE 技術 – 標準化について

**Standardized
in ULE Alliance**

HAN FUN (*)
Application Layer



Specification released in October 2013; available on UA Website

**Standardized
in ETSI**
(ETSI TS 102 939-1)

ULE Transport
Layer

Physical Layer
ULE = DECT



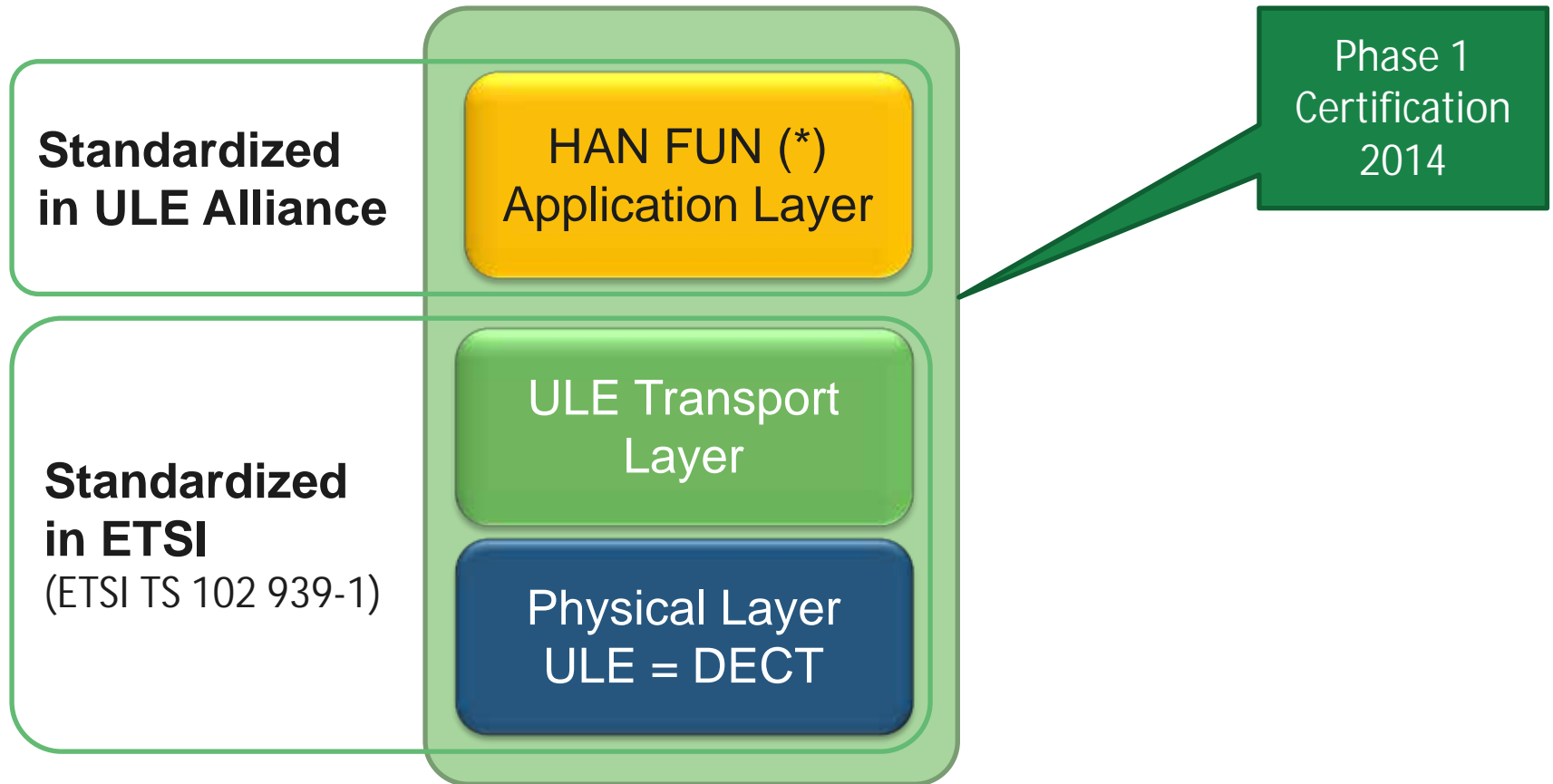
Specification Available since April 2013

Phase 2 features in development at ETSI

(*) HAN FUN – Home Area Network Functional Protocol

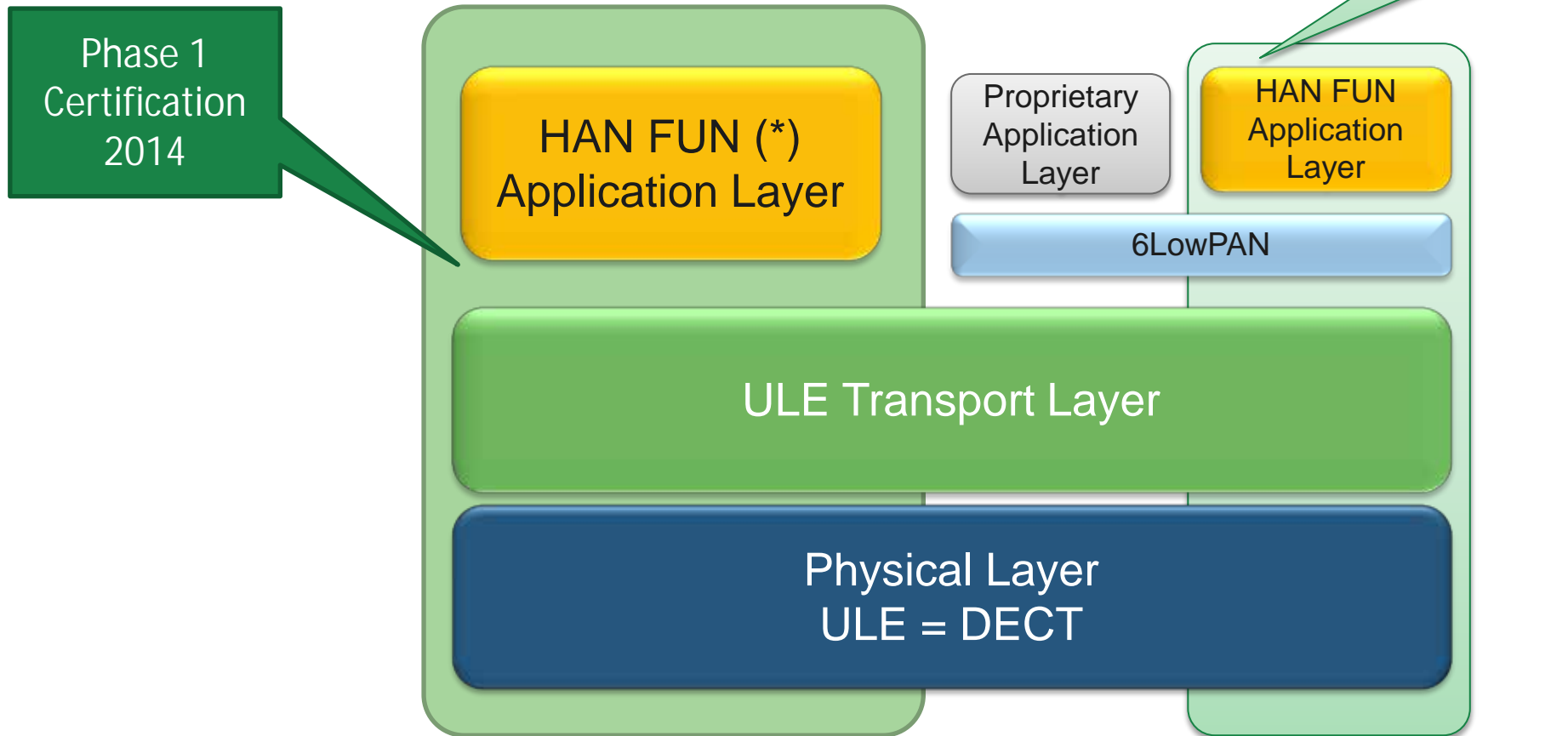


ULE Technology – 認証について



(*) HAN FUN – Home Area Network Functional Protocol

ULE Technology – 追加オプションについて



(*) HAN FUN – Home Area Network Functional Protocol

認証プログラム

認証プログラムを通し end products のみが approve される



ULE Certification Program

ULE Alliance のすべてのメンバーが申請可能

- マーケットは 認証を受けた市販ULE製品を求めている
- チャレンジ: cost sensitive, 但しクォリティでの妥協がないこと
- 対象: ノード 及び コンセントレーター
- 目標: program development completion and launch of certified devices in Q2'14
- 認証されたデバイスには ULE logo が利用可
- メンバーシップ (Contributor, Promoter and Adopter members) による認証費用体系に差異あり
- *More technical details in TWG presentation*



ULE Alliance 2014 - Strategy Overview

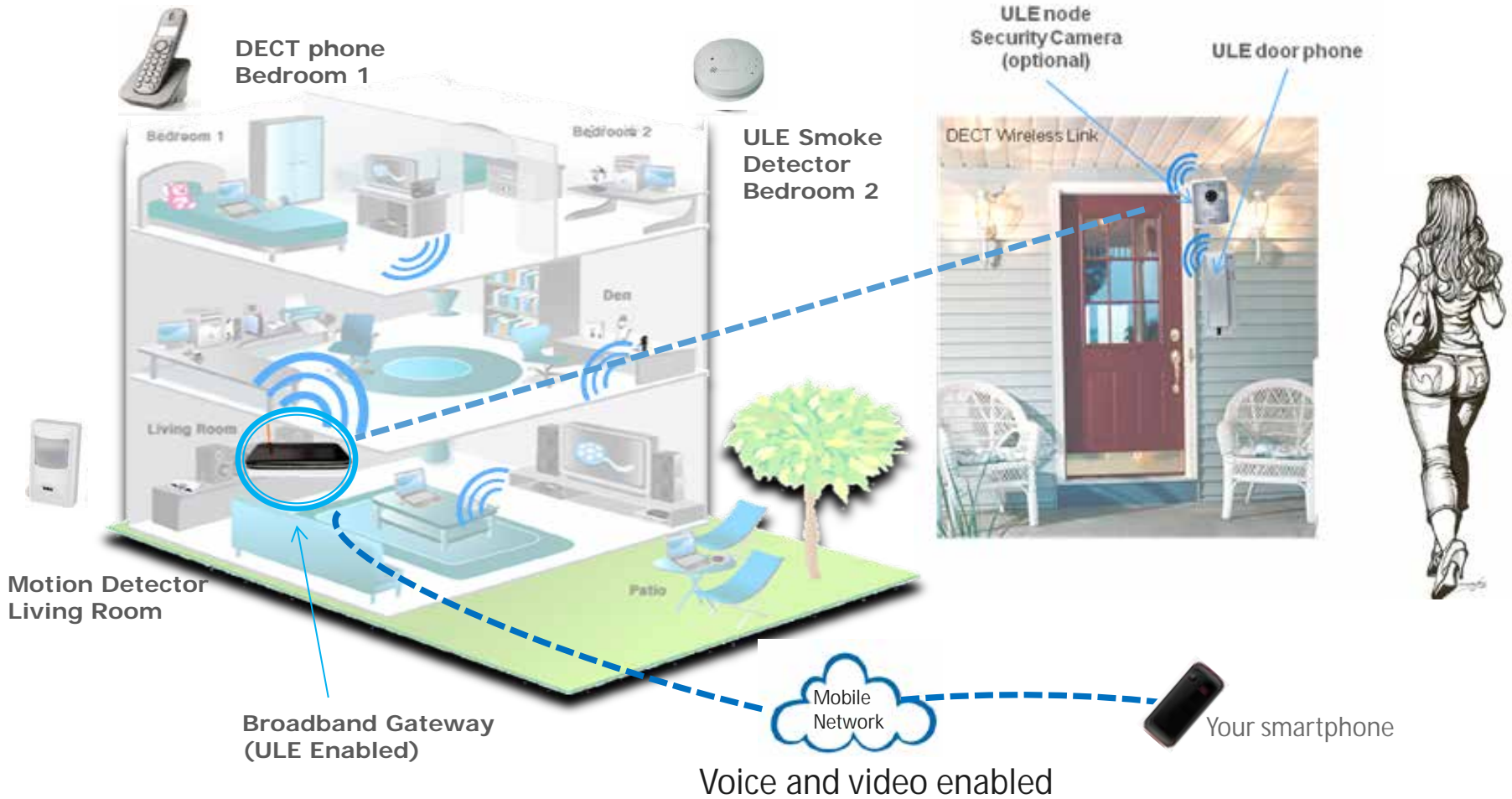
- ULE Domain - Smart Homes, part of Connected Home (wired and wireless) Network
- Focus segment: Home Automation, Home Security, Energy Control
- As part of eco-system, support for all possible business models for hardware manufacturers, software providers and service providers, delivering end to end solutions which include gateways, nodes, applications and services
- Focus on mass market channels
- Build on technical superiority of ULE vs. other short range wireless technologies:
Combined with wired technologies, e.g. PLC, and Wi-Fi and Bluetooth, ULE provides a complete solution for the Smart Home Applications, dramatically reducing the need in other wireless technologies
- Common interface to all nodes through standardization and certification

More ULE Advantages

- Extremely cost sensitive (consumer electronics background) – saving ownership cost
- As simple as installing a cordless phone at home – no professional installation required
- Surpasses any other short range wireless technology almost in any performance parameter
- And...

- Many years of DECT experience in standardization, certification – standard minded community
- Multiple chipset sources
- Strong manufacturer base worldwide, with decades of experience

音声, ビデオ, 制御 over ULE



ULE – the Best Technology for Wireless Home

Technology (adoption year)	Frequency & Range	Advantages	Drawbacks	Applicable Market Segments
Z-Wave 2003 Zensys Inc.	sub-1 GHz ^{#1} (Un-reserved) ~20 meters	<ul style="list-style-type: none"> • Low interference; • Moderate data rate: 40 kb/s 	Interoperability; Physical layer is proprietary	Primarily home-automation within Energy & Utilities
ZigBee 2001 ZigBee Alliance	2.4 GHz ^{#1} (Un-reserved) 70 meters	<ul style="list-style-type: none"> • Low power; • 2-way interoperable; • Medium data rate: 250 kb/s 	Network complexity; Interference issues; Certification body	Broad Range of applications within Energy, Utilities, Safety, Security & Tele care related
RF4CE 2008 RF4CE Consortium	2.4 GHz (Un-reserved) 70 meters	<ul style="list-style-type: none"> • Backed by CE market leaders; Built upon IEEE • 802.15.4 PHY 	Interference issues; Still in development	Entertainment related applications within the Home Networking vertical
Bluetooth Low Energy 2009 Nokia (pioneer)	2.4 GHz (Un-reserved) 10 meters	<ul style="list-style-type: none"> • Advanced 2-way communication; • High data rate: • 1 Mb/s; • Compatible with legacy Bluetooth systems 	Very short range; Ad hoc network; Interference issues; Not voice compatible	Personal Area Network (PAN) Applications only
ULE 2009 (ULE Working Group)	1.9 GHz ^{#1} (Reserved) 50-300 meters	<ul style="list-style-type: none"> • Interference free • Compatible with DECT enabled Home Gateway systems • Broad Installed base • Simple installation & operation • Low cost of ownership • 1 Mb/s Data Rate; • Voice Enabled 	DECT ULE is new & not yet established as mainstream in Low Power applications	Home Automation, Security, Climate Control and More...

ULE Alliance – Driving the ULE Technology

- 設立: 2013年1月
- 設立メンバー: DECT Forum, Dialog Semiconductor, DSP Group, Gigaset, VTech
- All with many years of experience in truly interoperable standard of DECT



ULE Alliance メンバーシップ

- Overview:
 - The number and type of members is an important indicator of success for an alliance. The larger, and more influential are the alliance members, the better it reflects on the public image and stimulates growth of the ULE community. And, of course there is a financial impact by having more Promoter and Contributor members.
- 2013:
 - Growth from initial 12 members to 43 members
 - Free first year contributor membership offer for full members of DECT Forum
 - Only 40% of DF members joined
- Goals for 2014:
 - Start with 45 members; promoters + contributors = 15
 - Grow membership to 60 (40% growth from 2013); contributing members – at least 20.
 - Focus on:
 - Operators
 - Device manufacturers

ULE Alliance Members (March 2014: total 49, shown 45)

Promoter



Contributor



Adopter



ULE Alliance – Vision & Mission

Vision:

- Establish ULE as the leading eco system for home automation
- Leverage from proven DECT radio technology
- Use a mature system deployed by 100's of million households
- Cover the whole house
- Build on available infrastructure

The ULE Alliance vision is to establish ULE as the world's leading control network eco-system for home and building use by leveraging the proven reliability and range of the DECT radio technology currently in use in 100's of millions of products worldwide.

Mission:

- Enable quick development of new products and services
 - Home automation, Security, Climate control
- Guarantee interoperability by IOP events
- Define ULE certified logo with certification program (2013)

The ULE Alliance allows its members to quickly develop new products and services in the areas of Home Automation, Security and Climate control by ensuring perfect interoperability between the products of the different vendors conforming to the standards, thereby delivering true customer satisfaction and increasing the overall size of the market for all participants.

Membership Categories

Type	Member Benefit	Member Cost	Alliance Objective
Promoter	Driving the agenda. Full access to all ULE Alliance documentation & activities & ULE certification program	Membership fee more info please contact the ULE Alliance Secretariat	ULE Alliance management team forming the board, with dedicated and committed resources
Contributor	Access to all ULE Alliances documentation and participation in its development. Full access to ULE certification program	Membership fee: 20K CHF	Enabling early adopters. Additional resources for development & promotion
Adopter	Access to all released ULE Alliance documentation. Full access to ULE certification program	No membership fee applicable but cost will apply to access Certification program (12,5K CHF) and IOP test event (7,5K CHF)	Lower the barrier to entry, technology promotion

Membership Types & Benefits

Benefit	Promoter	Contributor	Adopter
Drive the agenda, can be elected to the ULE Board	√		
Participate in the Business & Marcom Working Groups	√	√	
Participate in the Technical Working Group	√	√	
Access to all draft ULE Alliance profile specs	√	√	
Access to all internal ULE Alliance documentation	√	√	
Access to all published ULE Alliance profile specs	√	√	√
Access to all published ULE Alliance documentation	√	√	√
Participate in IOP events	√	√	«
Access to the certification program	√	√	«
Access to all joint promotional activities	√	√	√
Access to Members only discount on promotional activities	√	√	

« Available at additional costs

Benefits to Members

- Many years of DECT community experience in interoperability
- Application layer protocol to assure interoperability of device level
- Certification Program to assure standardization and Interoperability
- “Cooperation mindset” of the ULE Alliance members
- Interoperability events organized by the Alliance for its members
- Joint Market Promotion activities for members
- Cooperation Agreements:
 - ETSI & HGI – already in place
 - Other standard bodies and forums identified, in process



SIMPLY SECURE CONNECTIVITY

BY JOINING THE ULE ALLIANCE

Thank You!

Join ULE Alliance at:

www.ulealliance.org

**DECT Forum Japan Working Groupブース
(ブース W 14) では DECT, CAT-iq, ULEの
説明、製品展示、デモンストレーション等を行っ
ております。**

是非お立ちより下さい

