
Contela
Connect people to 5G and beyond

The Ultimate END-to-END Solution

The telecommunication equipment industry is split into two main categories; mobile access and broadband access. And according to how the communication network is structured, it is again divided into access and core equipment sectors.

Since Contela has launched the very first private network solution, Wireless Office Solution*, in 2001, we have been developing and deploying both access and core equipment with our own technology, following the network trends as the 5G network of today.

As an SME, Contela is the only company that has both product lines of core and access networks, even their management system to complete the ultimate end-to-end solutions.

This broad product line indicates how fast and strategically we can respond to market needs and thrive after all.

*WOS: voice call solution for 2G enterprise network

Founded : 2000

Headquarters : Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

President and CEO : Sun Park

Industry : wireless communication equipment developer and manufacturer

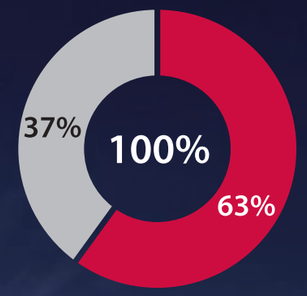
Factory : Jungwon-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

Employee composition

More than 60% of us are professional researchers and developers committed to developing new technologies.

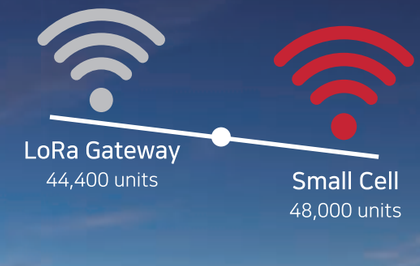
37% Sales & Management

63% R&D



Production capacity

Description	LoRa Gateway	Small Cell
Yearly	44,400 units	48,000 units
Monthly	3,700 units	4,000 units



Recognitions

• Certificates

- Venture Business
- Certified R&D Center
- Promising SME in Gyeonggi Province
- Quality Management System; TL9000 & ISO9001
- Inno-Biz
- Good Software

• Awards

Nov 2004	Export Tower of 5 Million / Korea International Trade Association
Jun 2012	Small Cell Forum Industry Award 2012/ Small Cell Forum
Oct 2012	Best International/ Mobile Excellence Awards
Jun 2013	Small Cell Forum Industry Award 2013/ Small Cell Forum
Dec 2015	Export Tower of 10 Million/ Korea International Trade Association
Dec 2017	Export Tower of 20 Million / Korea International Trade Association

• Intellectual Properties

- Patent Registration 114
- Patent Application 18
- Patent Publication 2
- Trademark Registration 13

Achievements & Successes

~2015

Sep 2012/ Nov 2013/ Jul 2014
- SK Telecom
- Deployed LTE Public Femto in 2012
- Deployed LTE Outdoor Femto in 2013
- Deployed LTE Enterprise Femto in 2014

Oct 2015
- Korea Railroad Research Institute
- Built up LTE small EPC system

Dec 2015
- SK Telecom
- Development project of Cell Broadcast System with Ministry of Science and ICT

2015
- Hitachi Japan(UQ)
- Delivered in-building LTE Small Cell and Core

Dec 2015
- Samsung Electronics(Verizon)
- Deployed LTE Home Small cell

2016

Feb 2016
- Korea Railroad Research Institute
- Supported LTE-R TB technology for building up a device platform

May 2016
- SK Telecom
- EPC IOT with commercial network
- eNB IOT with Samsung/Nokia
- Commercial IMS & EPC IoT

Oct 2016
- Korea Railroad Research Institute
- Operation project of LTE small EPC systems

Nov 2016
- SK Telecom
- Deployed LTE Home Femto

Dec 2016
- PS-LTE eNB IoT with Nokia

2016
- Hitachi Japan(UQ)
- Delivered in-building LTE Small Cell and Core

2017

Jul 2017
- Korea Railroad Research Institut
- Development project of LTE network system for T2T

Sep 2017
- Korea Railroad Research Institut
- Delivered LTE-R to urban railway project

2017
- Hitachi Japan(UQ)
- Delivered in-building LTE Small Cell and Core

2018

Jul 2018
- SK Telecom
- LTE-R project with Hanam line

Aug 2018
- The Armed Forces Financial Management Corps
- Multi-purpose tactical control LTE based infrastructure project with the air force

Nov 2018
- Korea Railroad Research Institut
- Rented LTE network for T2T communication development

2019

Dec 2019
- SK Telecom
- Wireless network infrastructure project of the 6th Han-Bit smart plant

Oct 2019
- Japan NTT communications
- Delivered and supported technology of Private LTE(sXGP) Small Cell and EPC

2020

Jan 2020
- SK Telecom
- Delivered Control Device for navy smart ship wireless network

Feb 2020~
- Hitachi-Eng Japan
- Delivered and supported technology of Private LTE(sXGP) Small Cell and EPC

Apr 2020~
- Panasonic Japan
- Developed Private LTE(sXGP) Small Cell
- Delivered in May 2021

What we do

	LTE(4G)	5G	IoT
Solution	Small Cell	Small Cell	LoRa Gateway
Product	Gateway	vCore	LoRa Network Server
	vEPC	LSH	

Customers & partners

SAMSUNG ELECTRONICS, verizon wireless, ERICSSON, SK telecom, KDDI, HITACHI Inspire the Next, Sprint, QUALCOMM, GENBAND, Alcatel-Lucent, ORACLE, hp, AudioCodes, Cisco Systems, Ulticom, SK C&C, SK telesys, ANGEL, intel, RADVISION, ARICENT

Private 5G Solution

What is Private 5G Solution?

Private 5G is about enabling new, innovative use cases that will bring great value to enterprises across different industries such as manufacturing, mining, logistics, etc.

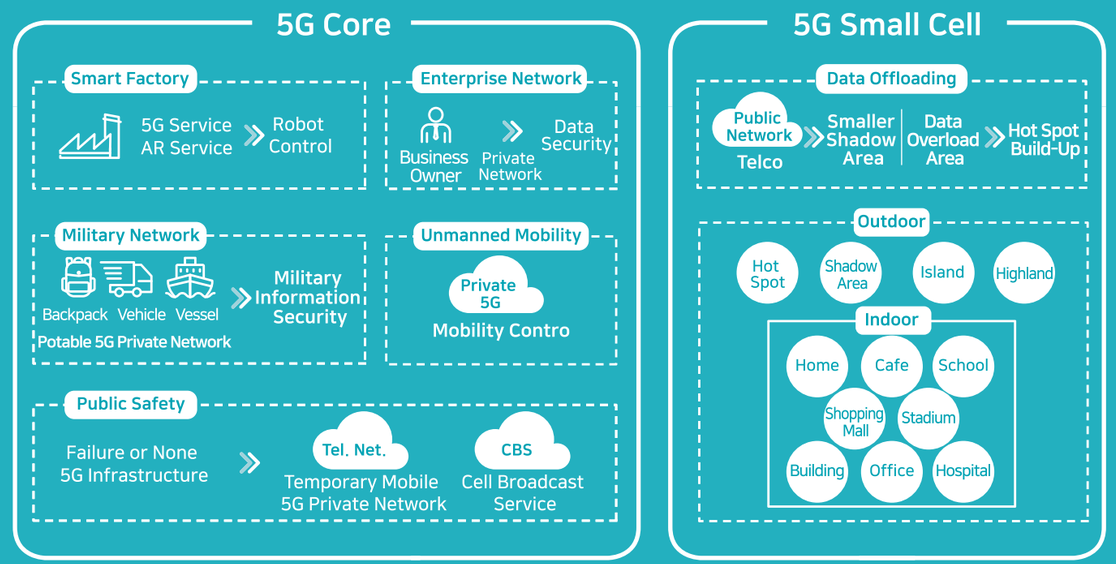
As 5G launches globally in 2019, advanced countries in telecommunications such as Germany, the US, and Japan started each own private 5G network service calling it different names; industrial 5G, local 5G, 5G CBRS, 5G LAN, enterprise 5G, and non-public 5G.

The Korean government also has launched the private 5G network service, the 5G-specialized network, accelerating usage of 'real' 5G technology. And Contela has been preparing for this since 2019.

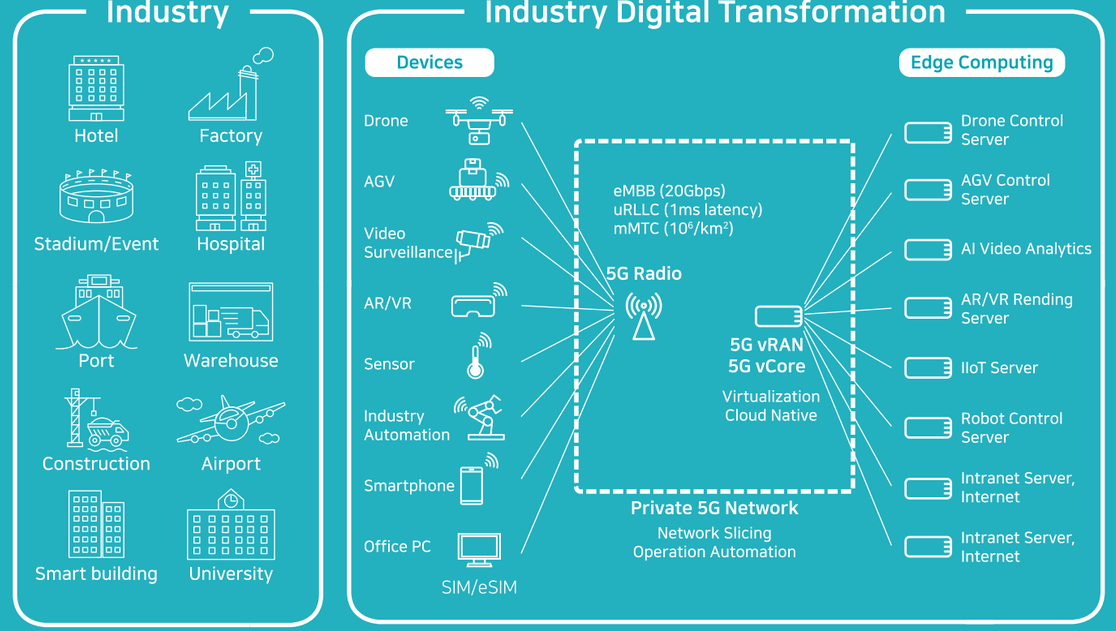
Completing development on 5G vCore in 2020, we are expecting 5G small cell by the end of 2021 as a part of a national project with ETRI. It is high time to innovate.

Description	Equipment	Product
Access Network	Base Station	Small Cell
	5G In-Building Hub	LSH(Layer Split Hub)
Core Network	Core Equipment	5G Core

Where is it applied?



How does it work?



5G In-Building Solution

What is 5G In-Building Solution?

Using a higher frequency band, 5G has lower building transmittance than that of the former generations. Its broader frequency band also makes it difficult to transmit signals to the existing distributed antenna system (DAS) inside a building. These are the reasons why 5G needs the in-building solution.

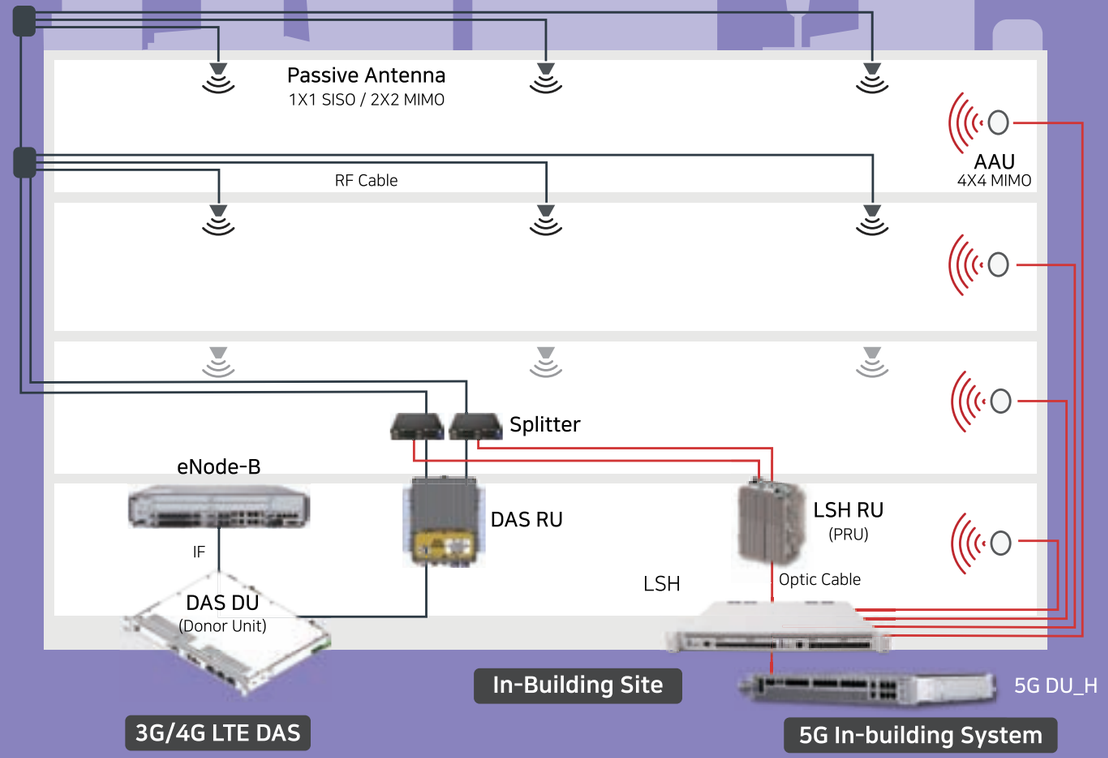
5G divides its base station system into DU and RU for better connectivity, locating DU in a central office and RU inside a building. Layer Split Hub, located between DU and RU, divides DU signals and distributes them to RU, and combines RU signals, then forwards them to DU.

Contela has been appointed as a sole supplier of LSH by Ericsson, a global base station company, and developed LSH with the appointer that transmits Ericsson's DU signals to RU devices inside a building. SK Telecom adopted LSH to their in-building solution and has been deploying it nationwide since 2019, enhancing the user experience of 5G.

Where is it applied?

Distribution	Application
Inside Building	As many DUs locate inside the building, LSH requires to interoperate with DUs inside the building
From Central Office	As fewer DUs locate inside the building, LSH requires to distribute by buildings at a central office.

How does it work?



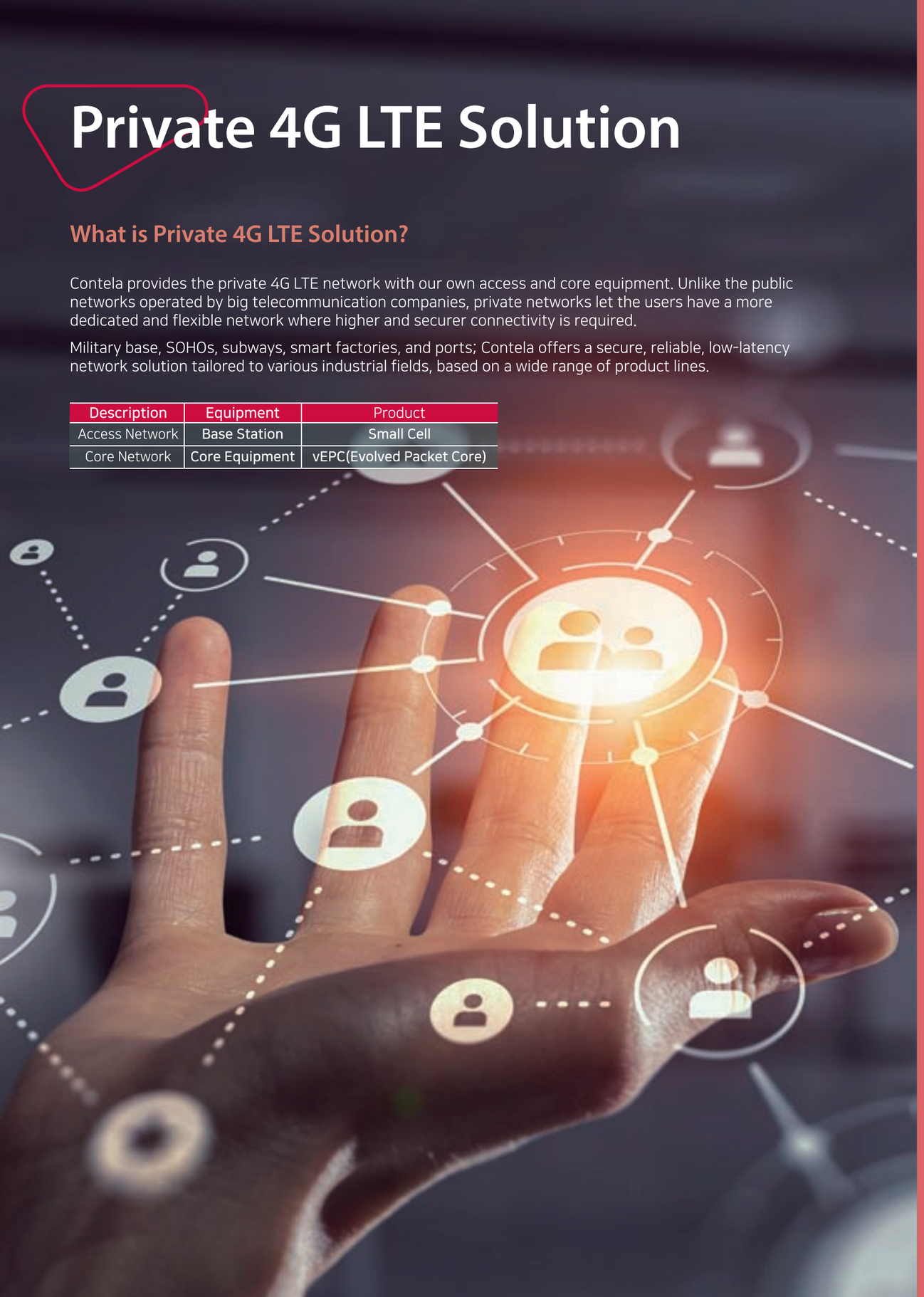
Private 4G LTE Solution

What is Private 4G LTE Solution?

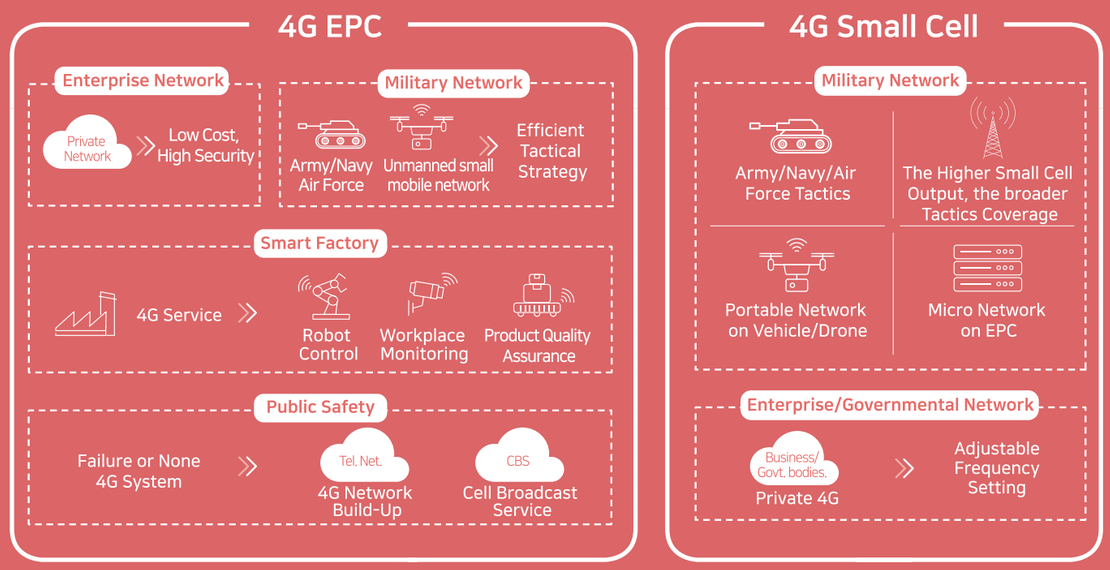
Contela provides the private 4G LTE network with our own access and core equipment. Unlike the public networks operated by big telecommunication companies, private networks let the users have a more dedicated and flexible network where higher and securer connectivity is required.

Military base, SOHOs, subways, smart factories, and ports; Contela offers a secure, reliable, low-latency network solution tailored to various industrial fields, based on a wide range of product lines.

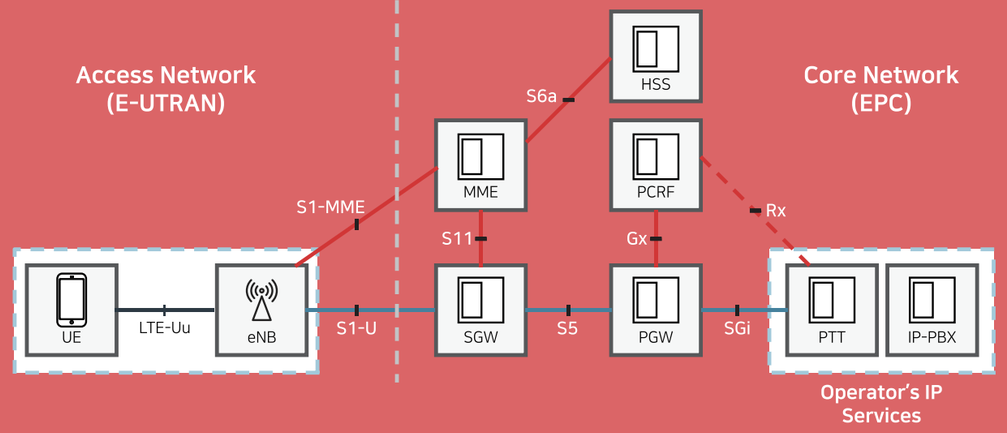
Description	Equipment	Product
Access Network	Base Station	Small Cell
Core Network	Core Equipment	vEPC(Evolved Packet Core)



Where is it applied?

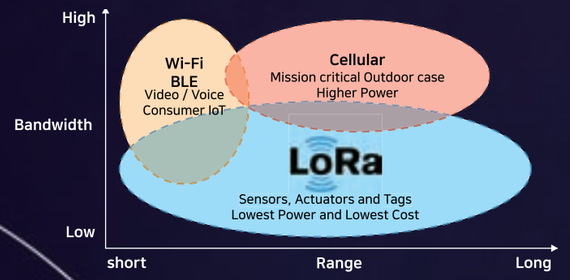


How does it work?



LoRa Network Solution

What is LoRa Network Solution?



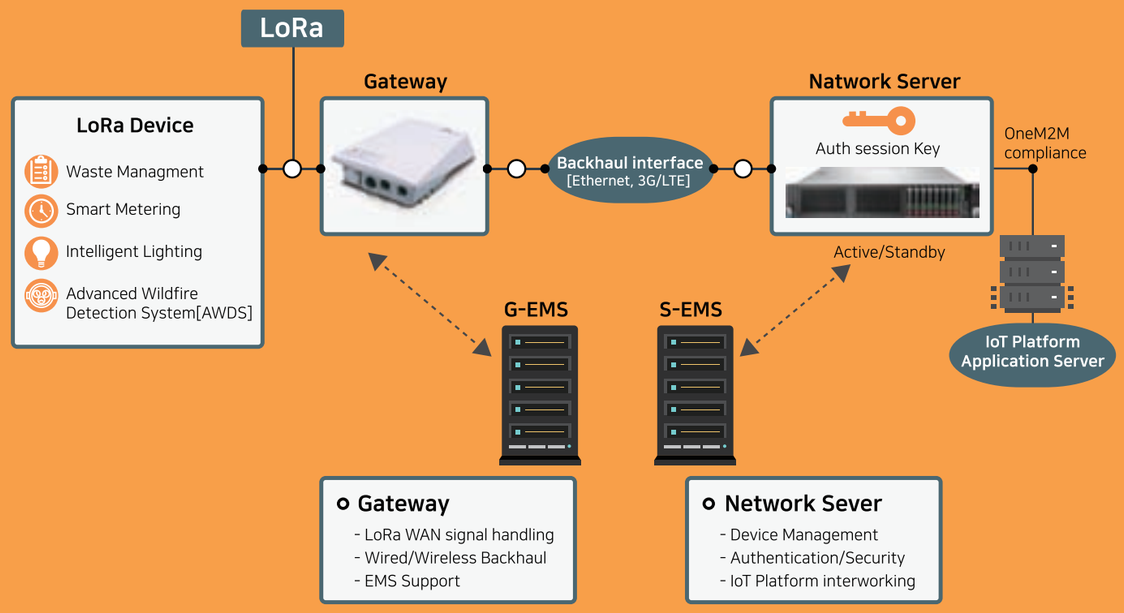
From gateway to network server, Contela provides end-to-end LoRa network solution, delivering IoTs to every part of our lives. With the LoRa solution, we can find our enhanced life with hundreds of IoTs.

LoRaWAN is a Low Power, Wide Area networking protocol using an unlicensed spectrum, unlike the widely known networks. As a critical technology in the ear of IoT, the coverage is wider and the power consumption is lower.

Contela has been appointed as a sole supplier of gateways and network server of IoTs by SK Telecom in 2015 and deploying our solution nationwide ever since.

Where is it applied?

How does it work?

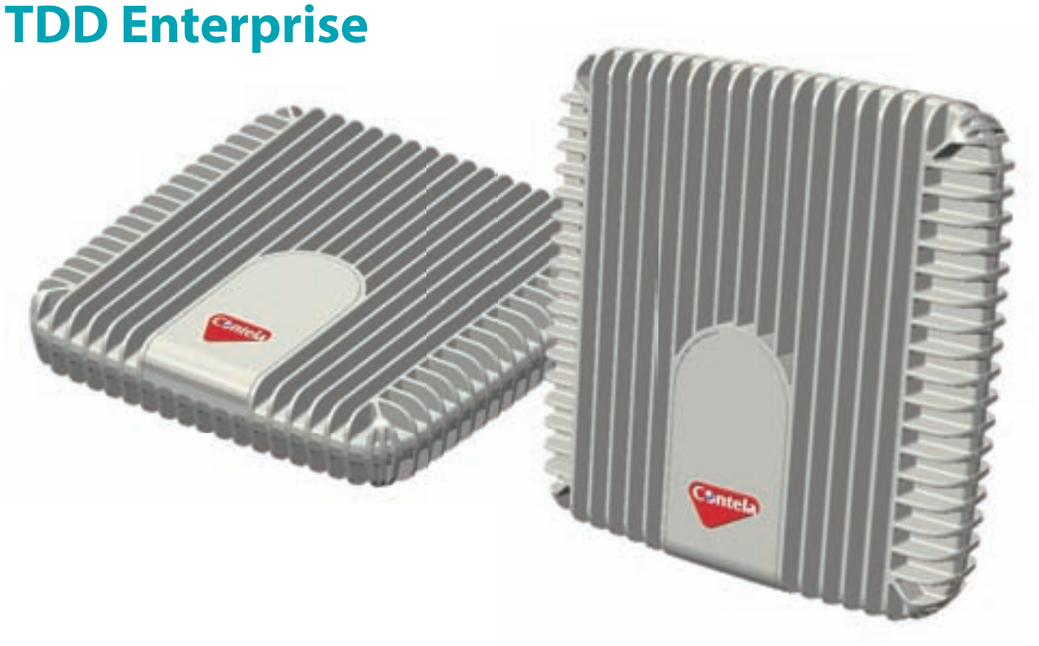


Small Cell

Small Cell is a low-powered small base station that provides telecommunication service of 4G LTE or 5G to the smaller spaces.

As a leading small cell solution company, Contela offers a wide range of small cell options, depending on how a user wants to utilize the network; residential, indoor, outdoor, and disaggregated. Due to its compact appearance, efficient installation and movement allow various private network solutions.

TDD Enterprise



Category	Description
Network	5G
Standard	3GPP 5G NR Rel 15
Division Duplex	TDD
Frequency	FR2 (28GHz)
Band Width	400 MHz (100/200/400)
Output Power	50dBm, 2x2 MIMO
Synchronization	GPS IEEE1588v2
Operation Environment	Natural convection Operating Temperature & Humidity: 0 ~ 40℃, 20% ~ 80%
Power Supply	AC/DC adaptor(AC100~240V, 50/60Hz)

FDD Enterprise

Category	Description
Network	4G LTE
Standard	3GPP Rel 15
Division Duplex	FDD
Frequency	BAND1, 3, 7
Band Width	5, 10, 20MHz
Output Power	200mW (100mW per path, 2x2 MIMO)
Synchronization	NTPv4
WiFi	2.4GHz/5GHz Dual Band 802.11 a/b/g/n 2x2 MIMO
Operation Environment	Natural convection Operating Temperature & Humidity: 0 ~ 40℃, 10% ~ 90%
Power Supply	AC/DC adaptor(AC100~240V, 50/60Hz)

TDD Enterprise

Category	Description
Network	4G LTE
Standard	3GPP Release 13
Division Duplex	TDD
Frequency	1899.1MHz, 1891MHz, 1914.1MHz ARIB STD-T118
Band Width	5MHz
Output Power	200mW (100mW per path, 2x2 MIMO)
Synchronization	GNSS (GPS, GLONASS, QZSS) IEEE1588v2
Operation Environment	Natural convection Operating Temperature & Humidity: -5 ~ 50℃, 5% ~ 90%
Power Supply	AC/DC adaptor(AC100~240V, 50/60Hz), IEEE802.3at PoE+

PRODUCTS

Small Cell

FDD Outdoor

Category	Description
Network	4G LTE
Standard	3GPP Release 15
Division Duplex	FDD
Frequency	BAND3, 5
Bandwidth	10, 20MHz
Output Power	40W (20W per path, 2x2 MIMO)
Synchronization	GPS
Operation Environment	Natural convection Operating Temperature & Humidity: -30 ~ 50℃, 5% ~ 90%
Power Supply	AC176~264V, 50/60Hz

TDD Outdoor

Category	Description
Network	4G LTE
Standard	3GPP Release 13
Division Duplex	TDD
Frequency	Confidential
Band Width	10, 20MHz
Output Power	40W (20W per path, 2x2 MIMO)
Synchronization	GNSS (GPS, GLONASS, QZSS) IEEE1588v2
Operation Environment	Natural convection Operating Temperature & Humidity: -30 ~ 50℃, 5% ~ 90%
Power Supply	AC176~264V, 50/60Hz

FDD Home

Category	Description
Network	4G LTE
Standard	3GPP Release 15
Division Duplex	FDD
Frequency	BAND3
Band Width	20MHz
Output Power	200mW (100mW per path, 2x2 MIMO)
Synchronization	NTPv4
Operation Environment	Natural convection Operating Temperature & Humidity: 0 ~ 40℃, 20% ~ 80%
Power Supply	AC/DC adaptor(AC100~240V, 50/60Hz)

In-Building LSH

LSH helps the 5G network cover indoor spaces more efficiently where the signal gets easily weaker such as an inside building. By interoperating a DU with multiple RUs, LSH distributes the 5G signals from the base station. It also features low installation cost as it can be operated on the existing DAS. LSH is the solution to boost your indoor networks.

Layer Split Hub

Category	Description
Network	5G
I/O Port	DU CPRI 1Port X 2, RU CPRI 8 Port X 2 RJ45 : Web GUI Port X 2, PSU Interface Optic(10G)
Operation Environment	FAN cooling Operating Temperature : -5 ~ +55℃ Operating Humidity: 5% ~ 90%
Power Supply	DC -48V
Mechanical Property	Dimension: 482.6x 44x 345(W x H x D mm) Weight: approximately < 3.6kg Mount type: 19 inch Rack Mount

Features

- Layer Distribution/Combining between DU and RU
- Transmit single RF signal through combining
- LSH can interoperate with 4 RUs per CPRI RU port in cascade mode; a LSH interoperates with maximum 64 RUs
- Automated TDD time synchronization
- Supply path to remotely monitor and control the distributed equipment

LoRa Gateway

LoRa Gateway, one of the access network equipment, operates as an interface between IoT devices and network server. Contela's LoRa Gateway guarantees carrier-grade quality from years of experience in the small cell business.

Indoor Gateway

Specification

Supporting Band	ISM 900MHz
Transmitted Power	25mW
Channel Bandwidth	125kHz, 250kHz, 500kHz
Dimension	136 x 136 x 29 (W x H x D mm)
Weather proof	IEC529-IP30

* US and Japanese ISM bands are available

Features

- **Wireless Backhaul**
  - Wireless (3G/LTE) backhaul and automatic switch
- **Optimized for In-building**
  - Optimized for in-building coverage not covered by Outdoor Gateway
  - Security key management & security package function
- **G-EMS and Statistics**
  - Management LoRa Gateway on G-EMS
  - System statistics and information search for each gateways
- **Compact Form Factor Indoor Equipment**
  - Small indoor equipment with esthetic design

Outdoor Gateway

Specification

Supporting Band	ISM 900MHz
Transmitted Power	200mW
Channel Bandwidth	125kHz, 250kHz, 500kHz
Dimension	175 x 250 x 55 (W x H x D mm)
Weather proof	IEC529-IP55

* US and Japanese ISM bands are available

Features

- **Wireless Backhaul**
  - Wired/Wireless (3G/LTE) backhaul and automatic switch
- **Security Function**
  - Blocking the source of unauthorized S/W download and installation
  - Security key management & security package function
- **G-EMS and Statistics**
  - Management LoRa Gateway on G-EMS
  - System statistics and information search for each gateways
- **On-site Support**
  - LED function for checking equipment status
  - On-site debug port and reset button

Core

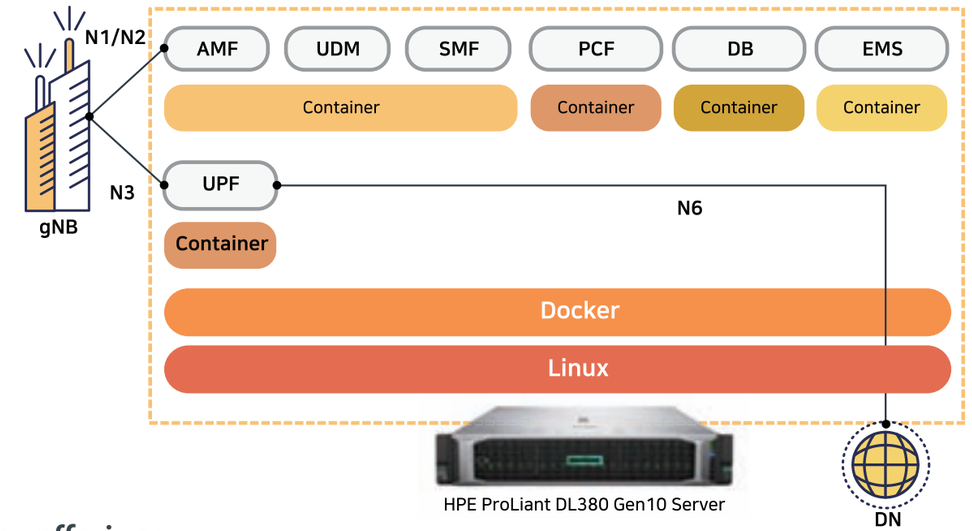
5G vCore

What is 5G vCore?

5G vCore(virtualized Core) is one of the critical components of private 5G network, operating as a connector between 5G small cell, terminal devices, and service devices.

Contela's 5G vCore comprises network functions such as AMF(Access and Mobility Function), SMF(Session Management Function), UDM(User Data Management), and PCF for Control Plane, UPF for User Plane, and EMS for Management system. Its whole and complete structure enables it not only to operate solely but to interoperate with the ones of telcos and branches.

How does it work?



Key offerings

Features

- 100% Contela S/W technology; prompt respond to customers inquires
- Easily operable on Cloud due to Linux container
- Enable to scale network functions separately due to containerization
- Enable for separate commercialization of control plane and user plane
- Support various network slicing technologies by one control plane interconnecting with 16 UPFs
- Support active-active control plane

Technology

- Design network based on high understanding of 3GPP standard
- 5G Core Network Protocol
- Afford flexible commercial deployment of private 5G
- Network slice
- High-availability
- Low latency and capability of processing large packet
- Provide an all-in-one total management system for various telecommunication infrastructures like core and access equipment, network, and DBMS

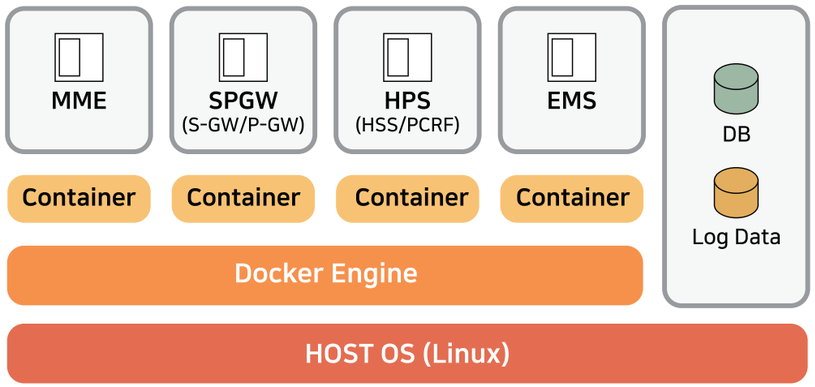
Core

4G LTE vEPC

What is vEPC?

As one of the critical components of private 4G network, Contela's EPC has all the essential nodes in one server; MME, SGW, PGW, HSS, and PCRF S/W. Completing the ultimate end-to-end solution, vEPC has its own management system for easier and securer network maintenance.

How does it work?



Key offerings

Features

- 100% Contela S/W technology; prompt response to customers inquires
- Provide a stable platform for high-availability based on 20 years of know-how
- Operates in various types of equipment due to network function virtualization on Linux container
- Support cloud-native architecture
- Enable to scale network functions independently due to containerization
- High-availability without holding carrying call
- Capable of managing large packet using DPDK

Technology

- Design network based on the high understanding of 3GPP standard
- Develop 4G EPC network protocol
- Manage and deploy EPC Container
- High-availability without down-time
- Provide low latency, processing large packet based on DPDK
- Numerous interoperability tests with global platform providers like Samsung, Ericsson-LG, and Nokia and various customer range from private sectors like SKT to governmental bodies
- Provide an all-in-one total management system for various telecommunication infrastructures like core and access equipment, network, and DBMS

LoRa Network Server

What is LoRa Network Server?

LoRa Network Server is a core node in the LoRa network solution, performing to register and authenticate the device or terminal. It also works as an interface with an application server or IoT platform. Contela's LoRa Network Server guarantees commercial-proven quality for various purposes such as high & low capacity, build-in, and on cloud.

Key offerings

Specification

Capacity	1,000,000 devices
High availability	System and network redundancy implemented

Features

- Subscriber information management
- Packet buffering
- Device activation
- Billing Functions
- Device address allocation
- Easy management through S-EMS
- Overload control
- Interworking with gateway and IoT platform
- Certification and security
- Subscriber location positioning function
- Stable Redundancy
- Device address allocation

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