



BUREAU
VERITAS

必维集团 塑造一个信任的世界

全球检测、验货、认证的引领者



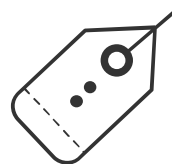
必维集团 (BUREAU VERITAS)

全球测试、检验、认证和技术咨询服务的行业推进者

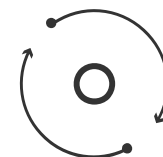
成本控制



品牌信誉



贸易便利化



经营许可



安全/可靠性



市场准入



公正

独立

诚信

成立于1828年



必维集团 (BUREAU VERITAS) 关键数字



€51 亿

2019年营收



75,000 名

员工



400,000 位

客户



1,400 个

办事处和实验室



3,500 张

认证和协议

我们的客户 (部份)



amazon



Cargill



CMA CGM



GLENCORE



LouisDreyfus



CORPORATION OF CHINA



190 年 历史



18
28

起源

“海事信息办公室”
的成立



19
20'

现代工业革命

伴随工业扩张而来的
新活动



19
60'

技术进步

积极建立船舶分类和
现代化建造标准

加强建筑和能源效率
方面的专门知识



19
90'

全球化

发展认证和政府服务

加强网络 - 在非洲、中
国、美国和欧洲设立
新办事处



20
10'

技术进步

Inspectorate和
Maxxam 加入集团并
成立大宗商品部门

拓展中国建筑和消费
品部

全球引领者



前2名

船级社

8%*

提供船舶和海上平台分级服务和技术支持,以评估和管理风险并提高绩效



第一名

工业

23%*

维护工业资产的安全性、可靠性和完整性,并评估遵守国家、国际和自愿 QHSE 标准的情况



第一名

建筑工程

24%*

提供建筑工程和在役或建设中的基础设施的合规、安全性和能效评估



前2名

认证

8%*

认证符合国际、国家、行业或公司特定标准的质量、健康、安全和环境管理体系



前3名

食品与大宗商品

23%*

提高透明度并验证从钻井到贸易、从农场到餐桌的整个价值链中商品的构成、质量和数量



前3名

消费品

14%*

测试和验证消费品的合规性、质量、安全性和性能,并提高供应链效率



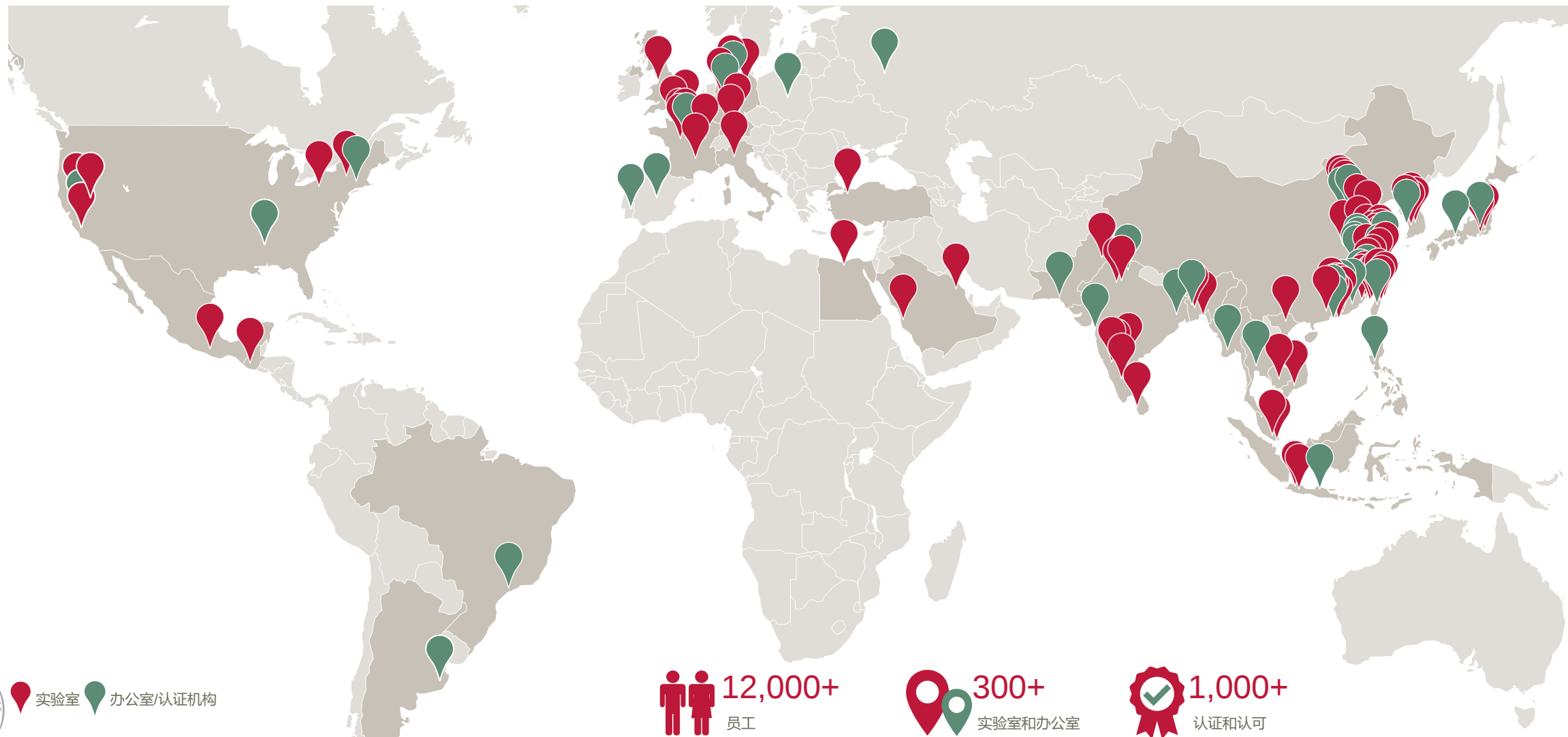
消费品部 概述

全球领先的消费和科技产品品牌和零售商的质量经理的选择

打造检测、验货、认证的全球引领者 - 必维



必维 - 全球网络



按国家/地区的实验室能力



Product Line											
Location	Softlines	Footwear	Hardlines	Toys	Wired EE	Wireless EE	Food	Cosmetics	Analytical	Automotive	IAA
Bangladesh	•	•							•		•
Cambodia	•										•
China	•	•	•	•	•	•	•	•	•	•	•
Hong Kong	•	•	•	•	•		•	•	•		•
India	•	•	•	•	•			•	•	•	•
Indonesia	•	•	•			•			•		•
Japan	•	•	•			•				•	•
Korea	•		•		•	•			•		•
Malaysia			•								•
Pakistan	•	•							•		•
Singapore	•	•	•						•		•
Sri Lanka	•						•	•	•		•
Taiwan	•	•	•	•	•	•		•	•	•	•
Thailand	•										•
Vietnam	•	•	•	•			•		•		•
Guatemala	•										•
Mexico	•	•	•	•					•	•	•
USA	•	•	•	•	•	•	•	•	•	•	•
Egypt											•
France	•	•	•	•	•	•			•	•	•
Germany	•	•	•	•	•	•		•	•	•	•
Italy	•	•	•						•		•
Saudi Arabia	•	•		•	•						
Turkey	•	•	•	•				•	•		•
United Kingdom	•	•	•	•	•				•		•

大中华区的实验室能力



Product Line											
Location	Softlines	Footwear	Hardlines	Toys	Wired EE	Wireless EE	Food	Cosmetics	Analytical	Automotive	IAA
Hong Kong	.	.	.	.	.		.	.	.		.
Beijing						.				.	
Cixi					.						
Dongguan					.	.			.		.
Guangzhou					.					.	
Hefei					.						
Jiangyin	.		.	.	.					.	.
Nanjing	.			.	.						.
Ningbo	.			.							
Panyu	.	.	.	.					.		.
Quanzhou	.	.			.						
Qingdao	.		.		.				.		.
Shanghai	.	.	.	.	.	.			.	.	.
Shaoxing	.										
Shenzhen			.	.	.	.	.	.	.		.
Tianjin										.	.
Wenzhou	.	.			.						
Wuhan									.		
Xiamen	.	.			.						.
Yongkang					.						
Zhongshan					.						
Zibo			.							.	
Taiwan	.	.	.	.	.	.		.	.	.	.

必维 - 全球认证和认可





EAW

电子电气 | 汽车 | 无线



电子电气

解决方案

- 涉及研发、预认证、认证/资格认证、监管和业绩的多阶段测试
- 检测包括化学测试、EMC、安全、RF和可靠性/环境模拟
- 验货和审计
- 多国认证服务。针对多个监管和行业要求的资格认证
- 全球 CBTL
- 在塑料、化学分析、制造和工程等多个领域拥有丰富的经验

竞争优势

100多年的经验

全球网络

提供监管和产品认证

全球用户体验 (UX) 测试 (耐久性/性能测试) 中心

核心领域

家用电器

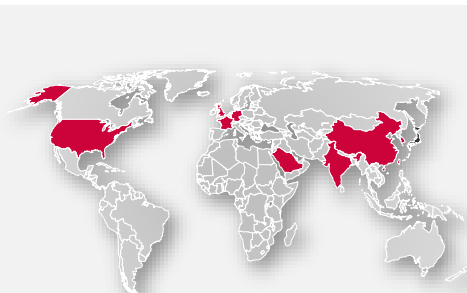
电池/电源

音频视频/IT设备

照明

电动工具

网络





汽车

解决方案

- 化学测试 (RoHS、ELV、VOC、...)
- 符合主要 OEM要求的EMC测试
- 环境模拟/可靠性测试 (腐蚀、IP、振动、气候等)
- v2x (dsrc) 测试和认证领域的全球引领者
- 对整个车辆和系统/部件进入亚洲、非洲和南美洲新兴市场的认证
- 充电站

竞争优势

具有完整服务范围的全球网络

美国、法国、中国 and 日本的卓越中心

经营中国首个独立的轮胎试验场

为世界上第一个OBU 和RSU V2X 认证产品提供检测服务

核心领域

材料

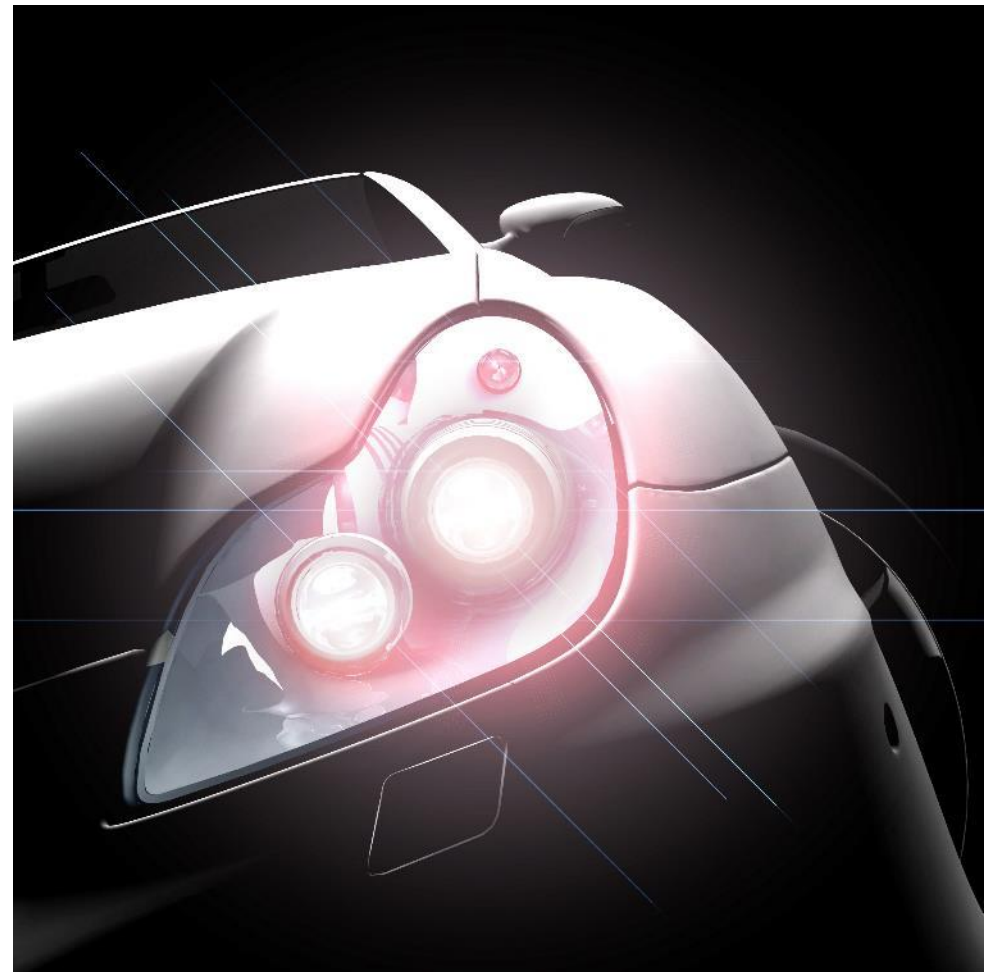
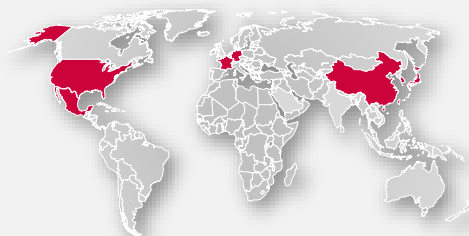
内外饰

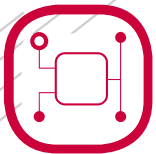
电子 (ECU、照明、电机等)

动力总成

轮胎

网络





无线

解决方案

- 测试和认证产品, 以验证它们符合法规、性能和行业要求。
- 解决主要技术问题:
 - PAN: 蓝牙, NFC, RFID
 - LAN: WiFi, Zigbee, Thread, DSRC
 - WAN: 2G/3G/4G-LTE, NB IoT, LTE-M, LoRa, Sigfox
- 支持全球150多个国家的多国认证
- 针对支付、网络和数据安全的解决方案

竞争优势

数十年的大型复杂项目管理/客户管理经验

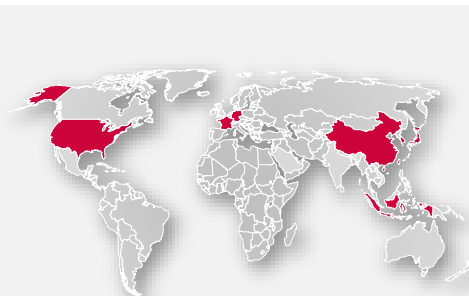
积极参与技术委员会

在美国、德国和台湾建立无线/物联网卓越中心

核心领域

核心科技提供商
智能手机/电信
智能家居/城市
互联人群
互联汽车
移动健康

网络



7LAYERS ROLE IN AN EVER SMARTER WORLD

Connecting
People

Connecting
Machines

Smart
Services

IoT



7LAYERS GROUP

1985-90 Development of “Complex Systems”

1987

Later 7layers staff offers first verification & validation services

1990–2008

Connecting people market increases

1992

7layers staff set-up 1st independent GSM test lab

1999

7layers founded, supporting the “connecting people” trend

2002

7layers launches InterLab® Software System for systematic management of complex verification & validation services

2008-15

M2M industries and “vertical” markets gain momentum

2010

7layers is involved in telematics, automotive, smart home, m-health, wearable...industries

2013

7layers joins Bureau Veritas, a world leader in conformity assessment and certification services for a large number of industries

2014

SODA® Model from 7layers for a better understanding of the complex requirements of Smart Services and Connected Devices

2015

Smart Services based on ubiquitous connectivity go to market

Bureau Veritas Smartworld segment expands continuously with new acquisitions and lab extensions.



BUREAU
VERITAS

SERVING MANY VERTICAL MARKETS

- PRIVATE SECTOR

- Smart home
- Smartphones etc.
- Wireless health
- Wearables ...



- TRANSPORT

- Connected transport systems
- Connected vehicles
- V2X services ...



- INDUSTRY

- Industrial IoT
- Agriculture
- Media & entertainment ...



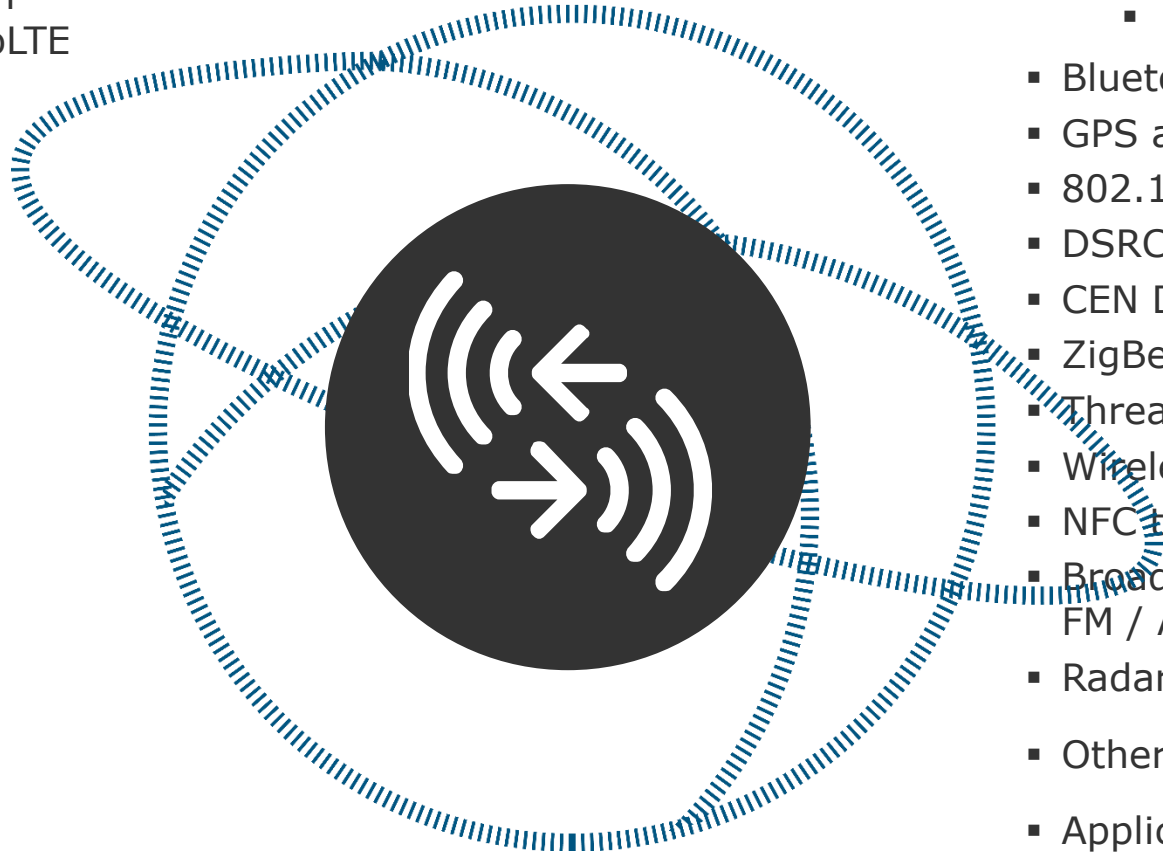
- PUBLIC SECTOR

- Smart cities
- Utilities
- Public safety providers ...



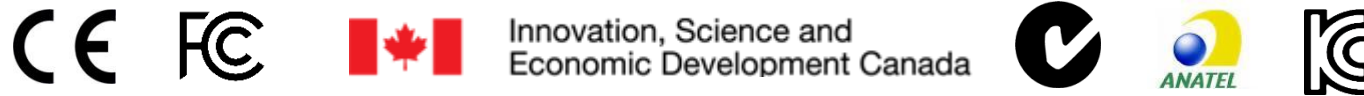
TECHNOLOGIES

- 5G
- LTE
 - EUTRA-FDD & EUTRA-TDD
 - Carrier Aggregation
 - Voice over LTE / VoLTE
- UTRAN
 - UTRA-FDD
 - HSDPA
 - HSUPA
 - HSPA+
 - W-AMR
- GERAN
 - GSM
 - GPRS
 - EDGE
 - DARF
 - AMR
- CDMA Technologies such as CDMA2000, TD-SCDMA and others
- TETRA
- LPWAN Technologies
 - LoRa
 - Sigfox
 - LTE Cat.M
 - NB-IoT
- Bluetooth®
- GPS and A-GPS
- 802.11x Wireless LAN
- DSRC/ 802.11p @5.9 GHz (V2X)
- CEN DSRC @5.8 GHz (tolling)
- ZigBee
- Thread
- Wireless Power Charging
- NFC technologies (RFID etc.)
- Broadcast Receiver technologies FM / AM/ DAB / DVB-T
- Radar technologies
- Other Short Range technologies
- Application Enabler technologies
 - S-UPL
 - Device Management etc.



CERTIFICATION – MARKET ACCESS CONCEPTS FOR END-PRODUCTS

- Regulatory requirements



- Industry interest group requirements



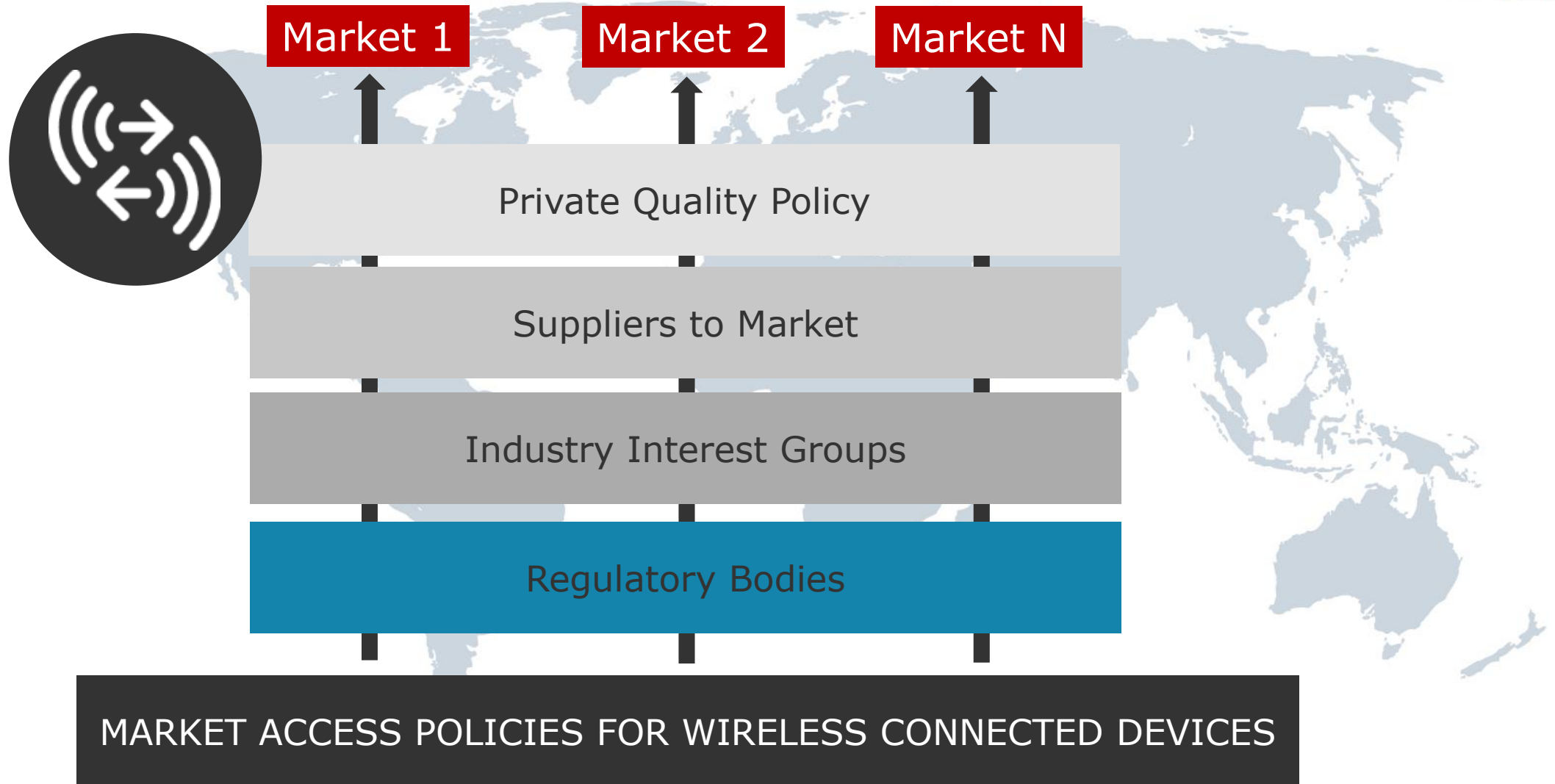
- Suppliers to market



- Private quality policies

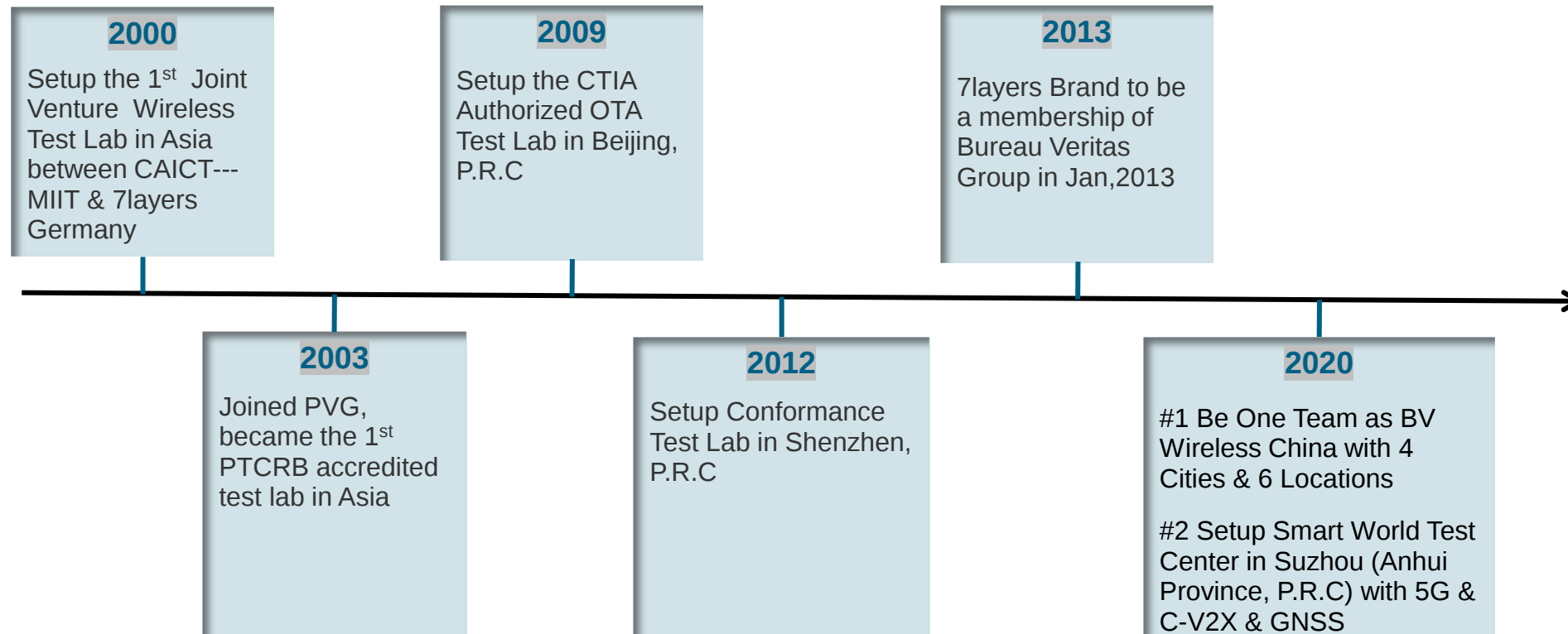


HURDLES TO MARKET



MILESTONES OF BV WIRELESS CHINA

7layers (JV between CAICT---MIIT & 7layers Germany) was founded in 2000.
We have been providing our clients with excellent test technologies and global market access services ever since.



DEPLOYMENT OF BV WIRELESS CHINA



Wireless Technologies

- Cellular technologies

*GSM/WCDMA/LTE/5G Sub6G/ 5G
mmWave*

NB-IOT/CATM

- Bluetooth®

- WiFi

- GNSS/AGNSS

- NFC

- Carplay

- E-Call/ERA-Glonass

- eSIM

RITT7LAYERS BEIJING

Service Scope:

RF/RRM/Protocol/OTA/ Acoustic/SIM/AGNSS/SUPL

Covered technologies:

GSM/WCDMA/LTE/NB-IOT/CAT M/5G Sub6G/eSIM

Test Equipment:

R&S: 8950G/8980FTA/CMW500/LBS;

Anritsu:7873LA/7873NR/7834/7834NR;

Starpoint:SP9630/SP9500;

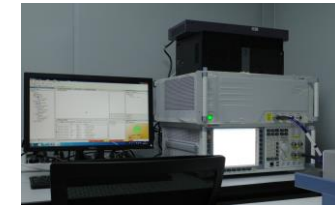
Keysight: UXM;

Comprion:UT3/RSP Tester;

OTA:ETS 8500+RS/Anritsu;

Acoustic: Head-acoustics+RS;

7layers:Interlab SIM



RITT7LAYERS SHENZHEN

Service Scope:

RF/RRM/Protocol

Covered technologies:

GSM/WCDMA/LTE/5G Sub6G

Test Equipment:

R&S: 8950G/CMW500;

Anritsu:7873F/7873L;

Starpoint:SP9500;

Keysight: Anite D9000;



BV7LAYERS SHENZHEN

Service Scope:

EMC/OTA/SAR/RF/Protocol/BQB

Covered technologies:

GSM/WCDMA/LTE/Sub6G/mmWave/Bluetooth/WIFI

Test Equipment:

Semi-anechoic chamber 9*6*6;

Fully Chamber;

ETS OTA Chamber;

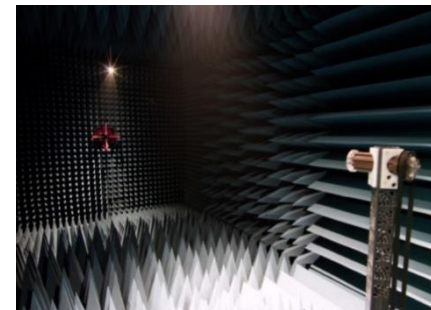
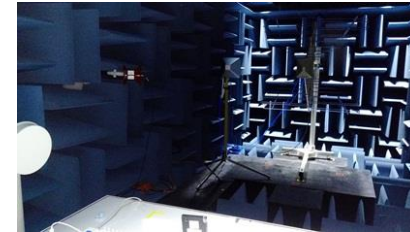
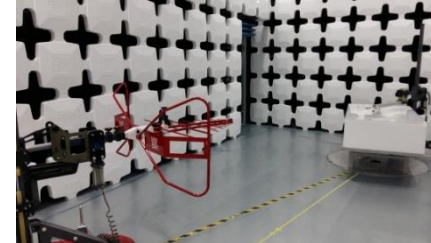
SPEAG SAR:Dasy 5/Dasy6/C-SAR;

CTTL-SYSTEM RTSB-A BQB test system;

Anritsu:7873L;

Keysight:GS8800/D9000;

Comprion:UT3



RITT7LAYERS SUZHOU

Service Scope:

EMC/OTA/SAR/RF/Protocol/eCall/ERA-Glonass/
Acoustic/SIM/GNSS/AGNSS/SUPL

Covered technologies:

GSM/WCDMA/LTE/5G Sub6G & mmWave/ BT/ WIFI/ C-
V2X

Test Equipment:

OTA: 1 * Chamber;

EMC: 2 * Chamber 9*6*6;

SPEAG:Dasy6/C-SAR;

R&S: 8980FTA;

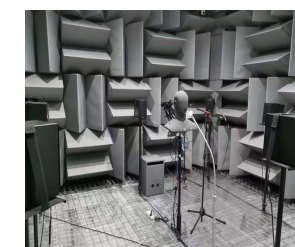
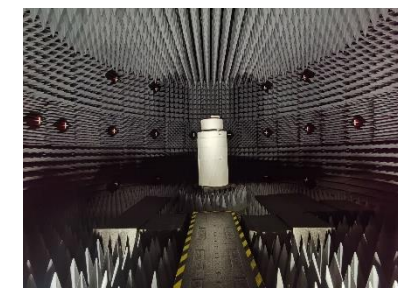
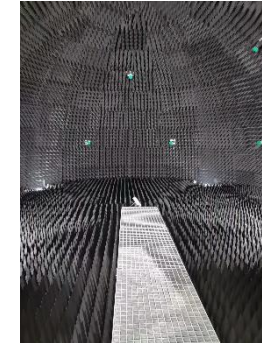
Starpoint:SP9500;

Spirent: A-GNSS/Zoned Chamber;

Keysight: H-56S;

Comprion:UT3;

Acoustic: Head-acoustics+RS;



AUDIO RELATIVE TEST SERVICE

TEST SCENARIO AGAINST ITU P.1100/P.1110 & 3GPP & CARRIER STANDARD

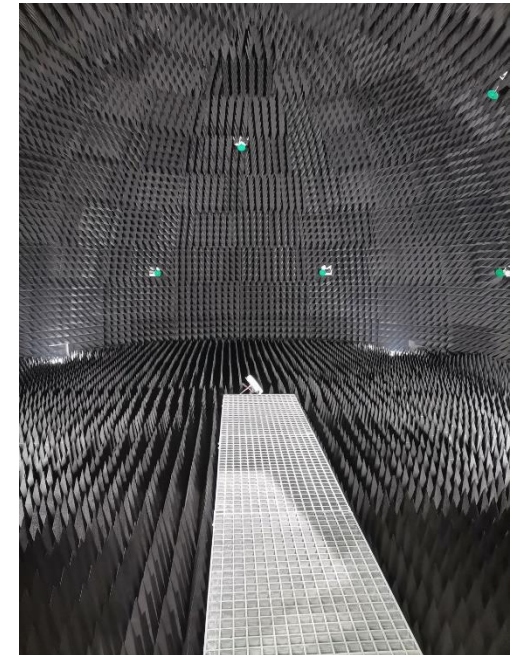


GNSS PERFORMANCE TEST

IDEA IN MIND



REALISTIC TEST SCENARIO IN LAB



ZONED CHAMBER FOR GNSS PERFORMANCE TEST

Wireless Terminal GNSS Perf Test

Full Vehicle HIL Test



Driving Simulator



Real Time Location
information

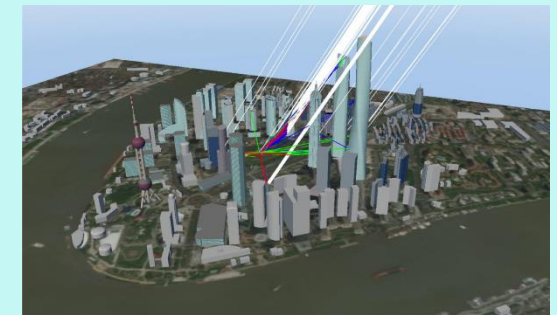
GNSS
Signal



Satellite Information
Exchange



Sim3D Environmental Simulation



5G NR FR1 RCT & C-V2X RCT TEST SYSTEM

FR1

Supported RF Conformance Test Standard

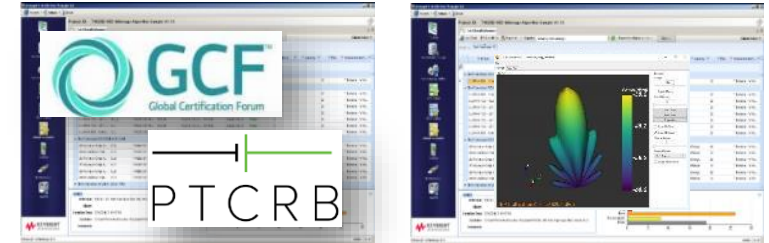
- 38.521-1 SA FR1
- 38.521-3 NSA FR1
- 38.521-4 RF Demod/CSI Reporting FR1
- 38.533 RRM FR1

Supported RF Carrier Acceptance

- TMO Test Cases
- VZW Test Cases
- ATT Test Cases

Supported C-V2X RF Conformance Test Standard

- 36.521-1 (WI-281-47;WI-282-47) RF Test Cases



H56-s

5G NR FR1 & FR2 PCT & C-V2X PCT TEST SYSTEM

FR2

FR1

Supported Protocol Test Standard

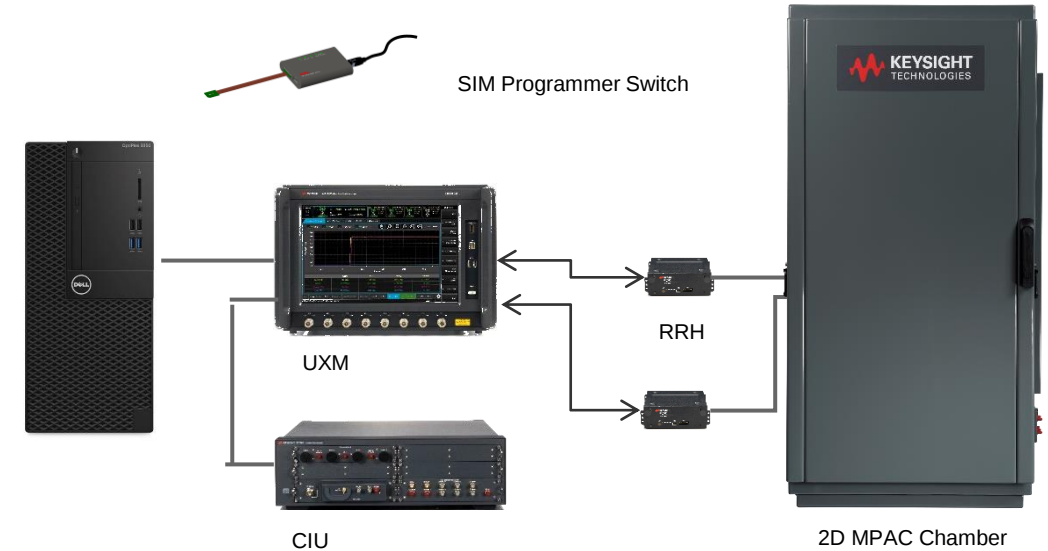
- 38.523-1 NSA Option3(FR1,FR2),SA Option2(FR1,FR2)
- 31.121(CT6) USIM
- 31.124(CT6) USAT

Supported Protocol Carrier Acceptance

- CMCC TC
- CTC
- CU
- NTT
- Rakuten
- TMO
- VZW
- ATT

Supported CV2X Protocol Conformance Test Standard

- 36.523-1 (WI-281-47;WI-282-47) Test Cases



FR1 system - conducted ; FR2 system - OTA

5G NR FR1 SIM TEST SOLUTION---ECT9610 & UTP1000

FR1

Supported Test Standard

- 38.523 PCT
- 31.121 USIM
- 31.124 USAT

Supported Carrier Acceptance

- China Telecom Test Cases



Conformance Assessment Table									
3.00.1_20201205_r025									
powered by CETECOM GmbH									
Specification	Test Case	TC Description	WI	Type of	Band Applicability	Category	Validated Test Platforms	Validated Test Platforms with Exceptions	Downgraded Test Platforms
31.121	5.3.1	SUCI calculation by ME using null scheme	WI-500-NR	USIM	All	A	226, 227	304	
31.121	5.3.2	SUCI calculation by ME using profile B	WI-500-NR	USIM	All	A	226, 227	304	
31.121	5.3.3	UE identification by SUCI during initial registration	WI-500-NR	USIM	All	A	226, 227	304	
31.121	5.3.4	UE identification by SUCI in response to registration request	WI-500-NR	USIM	Single	A	226, 227	304	
31.121	5.3.5	UE identification by SUCI in response to registration request	WI-500-NR	USIM	Single	A	226, 304		
31.121	5.3.6	UE identification by SUCI in response to registration request	WI-500-NR	USIM	Single	A	226, 227, 304		
31.121	5.3.7	SUCI calculation by the ME using null scheme	WI-500-NR	USIM	All	A	226, 227	304	
31.121	5.3.8	UE identification by 5G-GUTI - Last Registered	WI-500-NR	USIM	Single	A	226	304	
31.121	5.3.9	UE identification by 5G-GUTI - Last Registered	WI-500-NR	USIM	Single	A	226, 304		
31.121	5.3.10	UE identification after SUPI is changed	WI-500-NR	USIM	Single	A	226, 304		
31.121	5.3.11	SUCI calculation by ME using Profile A	WI-500-NR	USIM	Single	A	226, 227	304	
31.121	5.3.13	SUCI calculation by ME using null scheme	WI-500-NR	USIM	Single	A	226, 304	227	
31.121	5.3.14	SUCI calculation by ME using null scheme	WI-500-NR	USIM	Single	A	226, 304	227	
31.121	5.3.15	SUCI calculation by ME using null scheme	WI-500-NR	USIM	Single	A	226, 304	227	
31.121	5.3.16	SUCI calculation by ME using the lower	WI-500-NR	USIM	Single	A	226, 227, 304		
31.121	5.3.17	SUCI calculation by ME using Profile B	WI-500-NR	USIM	Single	A	226, 227, 304		
31.121	5.5.1	Display of 5G Operator PLMN name from	WI-500-NR	USIM	Single	A	226, 300		
31.121	5.5.2	Display of registered 5G PLMN name from	WI-500-NR	USIM	Single	A	226, 300		
31.121	15.1.1	Authentication procedure for EAP-AKA'	WI-500-NR	USIM	Single	A	226		
31.121	15.1.2	Authentication procedure for EAP-AKA'	WI-500-NR	USIM	Single	A	226		
31.121	15.1.3	Authentication procedure for EAP-AKA'	WI-500-NR	USIM	Single	A	226		
31.121	15.1.4	Authentication procedure for EAP-AKA'	WI-500-NR	USIM	Single	A	226		
31.121	15.2.1	Authentication procedure for 5G AKA - A	WI-500-NR	USIM	Single	A	226		
31.121	15.2.2	Authentication procedure for 5G AKA - A	WI-500-NR	USIM	Single	A	226		
31.121	15.2.3	Authentication procedure for 5G AKA - A	WI-500-NR	USIM	Single	A	226	160	
31.121	15.2.4	Authentication procedure for 5G AKA - A	WI-500-NR	USIM	Single	A	226		

5G NR FR2 RCT & CTIA OTA TEST SYSTEM---H56M

FR2

Supported RF Conformance Test Standard

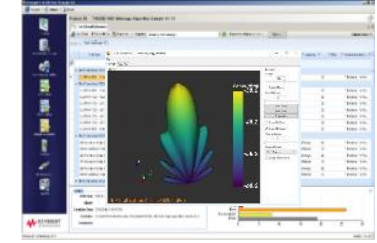
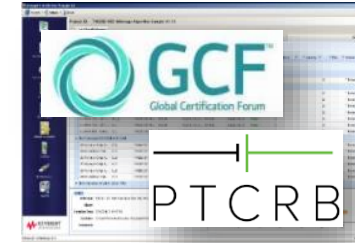
- 38.521-2 SA FR2
- 38.521-3 NSA FR2
- 38.521-4 RF Demod/CSI Reporting FR2
- 38.533 RRM FR2 (Up to 2AoA)

Supported RF Carrier Acceptance

- TELEC
- VZW & TMO & ATT Test Cases

Supported CTIA OTA Test Standard

Test Plan for Millimeter-Wave Wireless Device Over-the-Air Performance v1.0.1



FR1 SISO/MIMO OTA SYSTEM

FR1

Supported SISO OTA Test Standard

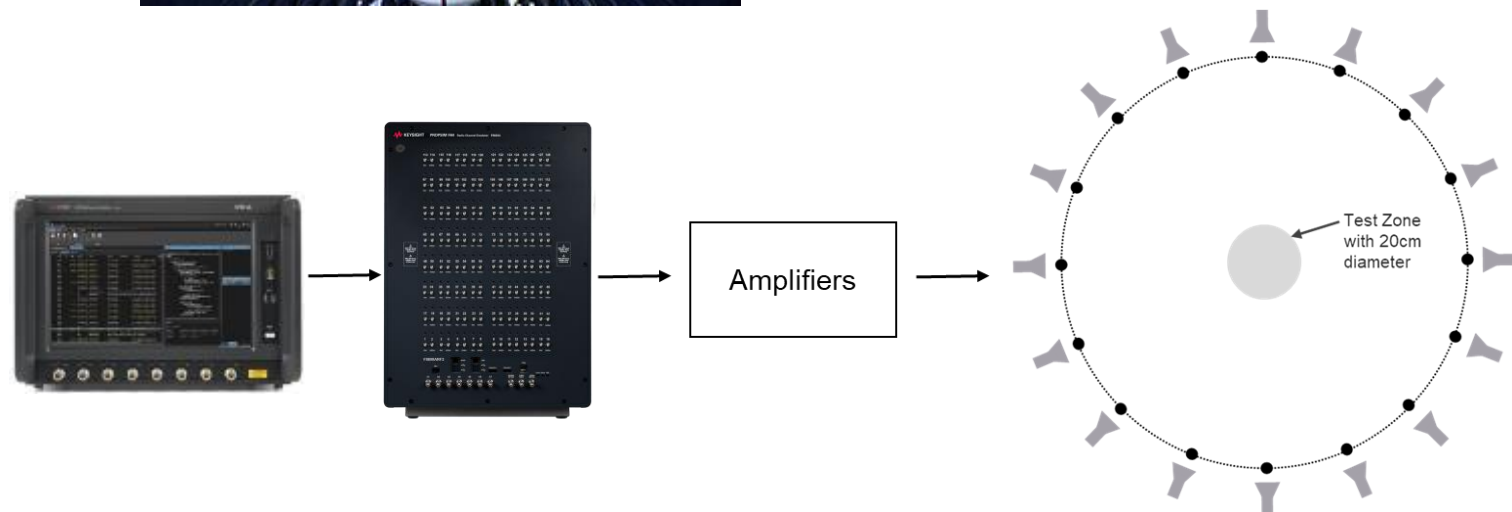
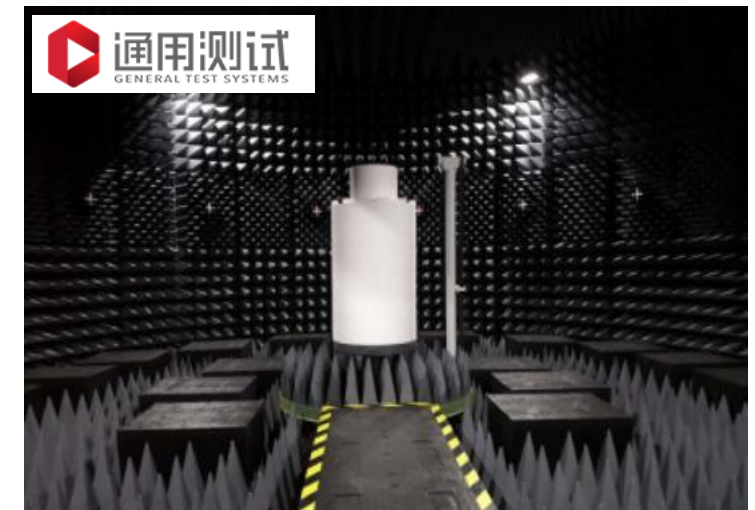
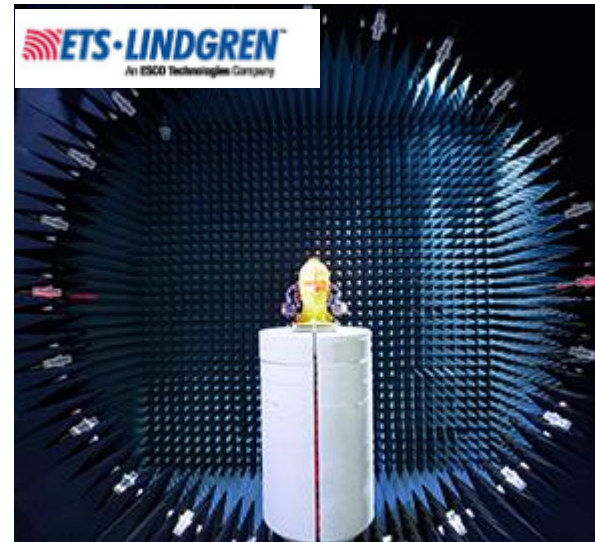
CTIA Test Plan 3.8.2 Apr 2019

(Next test plan version 3.9 will include NR FR1 SA, NSA is coming soon with v4.0)

Supported MIMO OTA Test Standard

5G Model including HST model

3GPP TR 38.827



5G NR FR1 HST

FR1

使用星河亮点网络仿真器

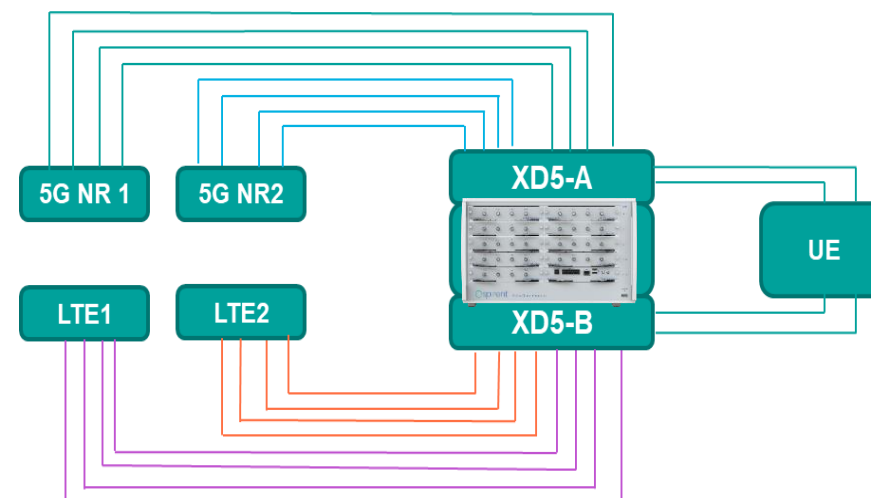
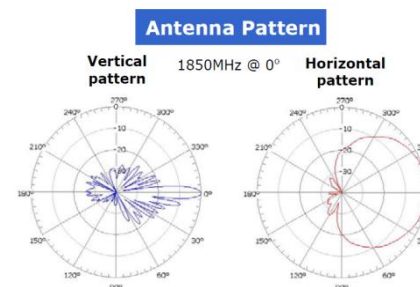
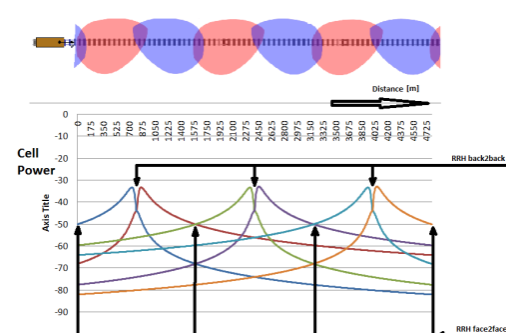
可支持2 NR小区的SA测试

可支持2 NR + 2 LTE的NSA测试

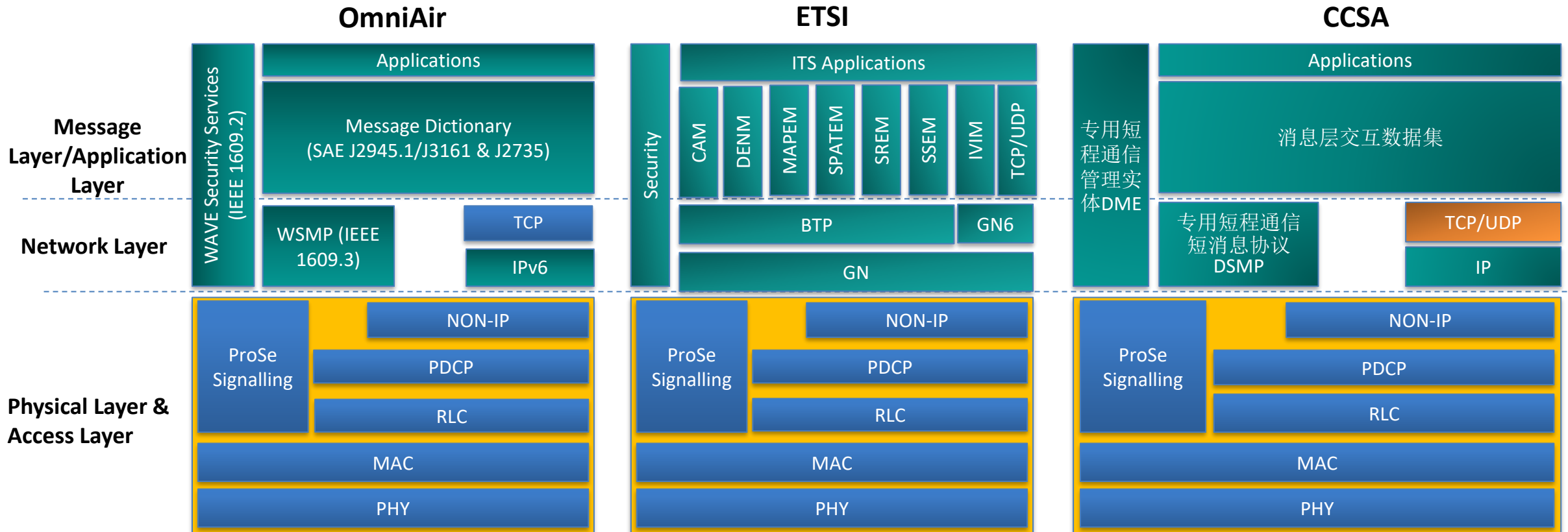
使用单台Vertex信道仿真器与2台XD5接口箱构建双向环境

针对多种典型高铁场景精确建模

测试终端在高铁场景下的性能



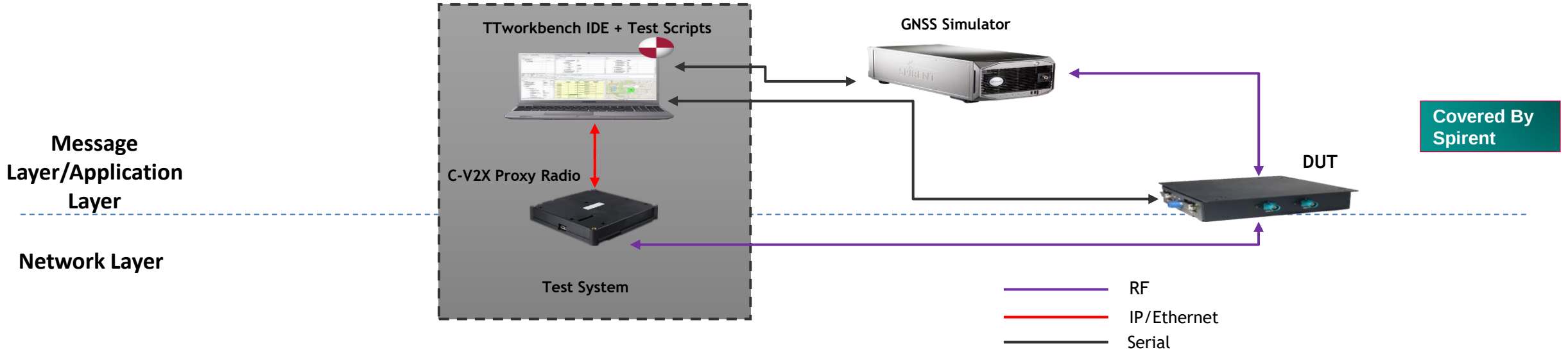
C-V2X SPEC ARCHITECTURE



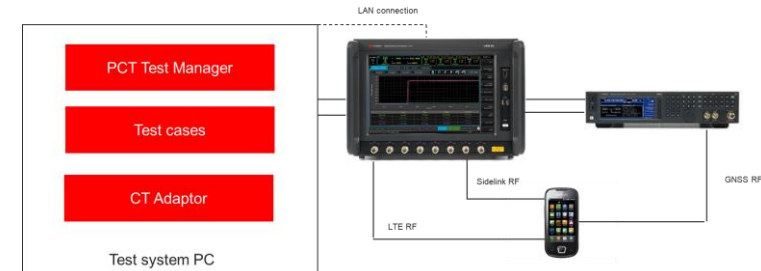
Covered By
Spirent

3GPP Scope

C-V2X CONFORMANCE TEST SCENARIO

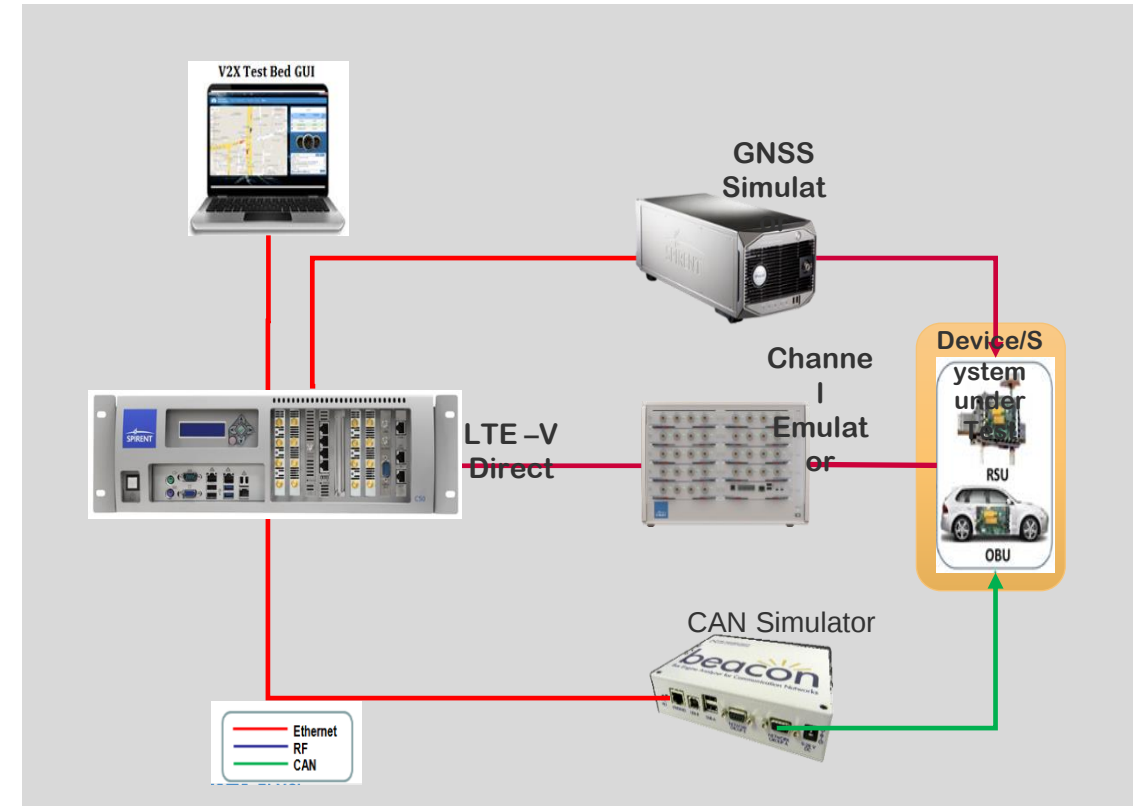
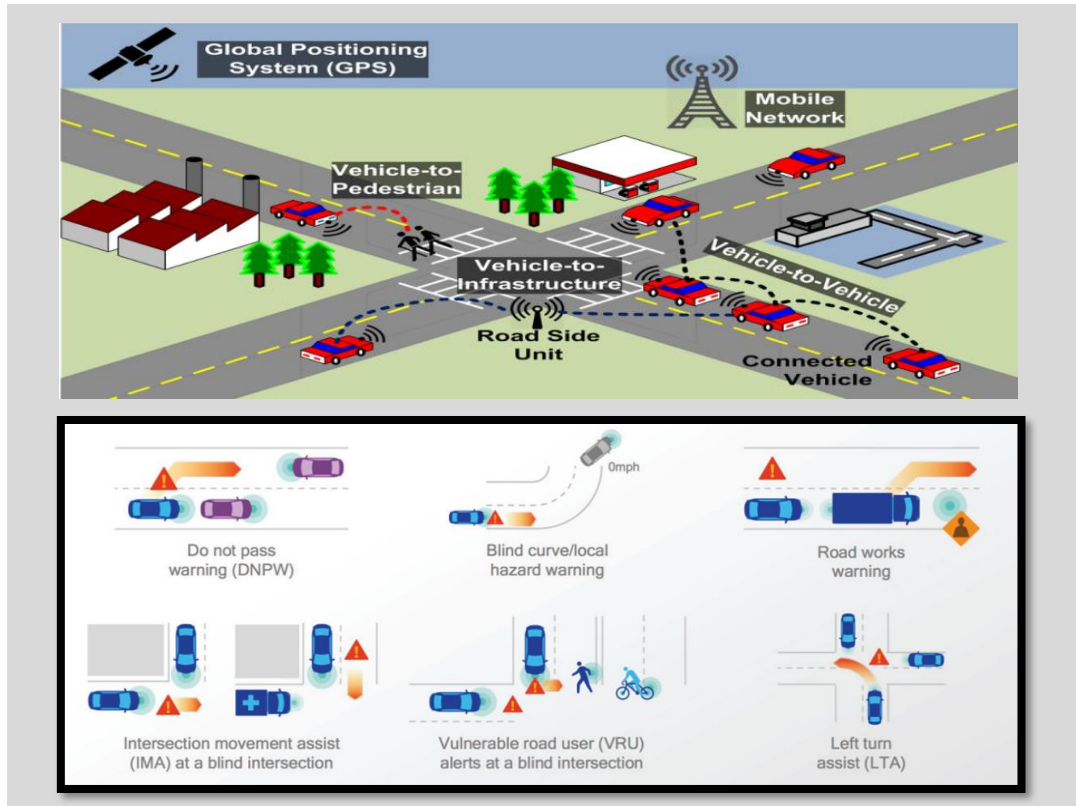


RF/RRM Conformance Test Configuration



Protocol Conformance Test Configuration

NEW FURTHER TEST TOPIC IN C-V2X



SECURITY SOLUTIONS



付款安全

- 发展智能支付测试服务 (EMVCo / Visa)
- 适用于手机制造商;pos 终端供应商和芯片供应商
- 必维定位: 智能手机测试 + 智能支付 + 网络安全中

48%

移动支付 CAGR (2016-2021)
From 110Bn – 775Bn USD



网络安全

- 产品网络安全测试解决方案
- 与CEA Leti合作
- 破坏性的测试方法 (自动化)
- 将检测时间从几个月缩短到几天

41%

网络安全服务预算 CAGR (2015-2020)
From 9Bn – 50Bn USD



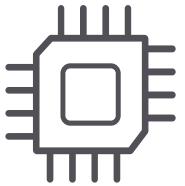
战略合作



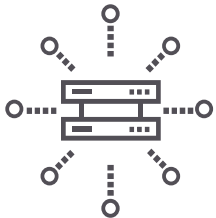
AUTO CYBERSECURITY PENETRATION TEST SERVICE

HIGH LEVEL ARCHITECTURE

DEVICE UNDER TEST



ECU FAMILIES



COMPLEX
SUB-SYSTEMS



COMPLETE CARS

KEYSIGHT TEST AUTOMATION PLATFORM

HARDWARE

CONNECTIVITY GATEWAY

Cellular
WiFi
Bluetooth
CAN
Future capabilities

SOFTWARE & SERVICES

EXPLOITATION SOFTWARE

Port scanning
Fuzzing
Flooding (DDoS)
Denial of service attacks
Future capabilities

AUTOMATED ATTACKS

Install FTP
Shut down service
Capture data
Future capabilities

Customer Specific Threats

Application and Threat Intelligence Subscription



Regression Test
Library



BUREAU
VERITAS

POWERED BY

PATHWAVE

SYSTEM SETUP

Protocol specific connectivity gateways

USB based connectivity hub
WIFI, Bluetooth, CAN, and more

E7515A Keysight UXM 4G
2G, 3G and 4G cellular connectivity

Management servers

Windows Management server
Keysight PEN test platform

Linux based recon and fuzzing server
Exploitation and service attacks

E7515B Keysight UXM 5G + C-V2X
5G + C-V2X cellular connectivity
*Support manual registration only now





THANK YOU



FOLLOW US
on social networks

