E800(5G)/E700(LTE Cat12)/E700A(LTE Cat12)/E600(LTE Cat6)/E600A(LTE Cat6) Outdoor Unit

Introduction and Examples

BandRich Strategic Partnerships

- Business licensee partner since 2006
- Modem/Wi-Fi/Router chipsets supplier

- Business partner since 2017
- Modem module supplier (Qualcomm chipsets)

E800/E700/E700A/E600/E600A Key Features

- IP67 with built-in heater – Build for Extreme weather
- High gain antenna – over 5 dBm for low band and about 10 dBm for high band
- Remote management – support HTTPS, TR069, SMNP
- 5G NSA/SA(E800 using Qualcomm SDX55)
- Carrier Aggregation – 4 CA(80Mhz BW) – LTE Cat20 of E800
- 3 CA(60Mhz BW) – 256QAM DL 600M/UL 150M of E700/E700A
- 2 CA(40MHz BW) – 64QAM DL 300M/UL 50M of E600/E600A
- Support router/Bridge mode-- can be use with Cisco ASA and relay LTE microcell
- Complete "Plug and Play" solution, only requiring power to enable backhaul to be

Modem **Sierra Wireless** **AirPrime** **EM7565/7511/7455** **/7430** Qualcomm Snapdragon X7	**Router** **Qualcomm** **IPQ4019** Quad-core A7	**USB 3.0** **Super High** **Speed**	**Gigabit** **Qualcomm** **QCA8075** **Gigabit POE**

Main or Backup internet
IoT Application - WiFi Based

Power over Ethernet (PoE)

Switch/Wi-Fi Hub
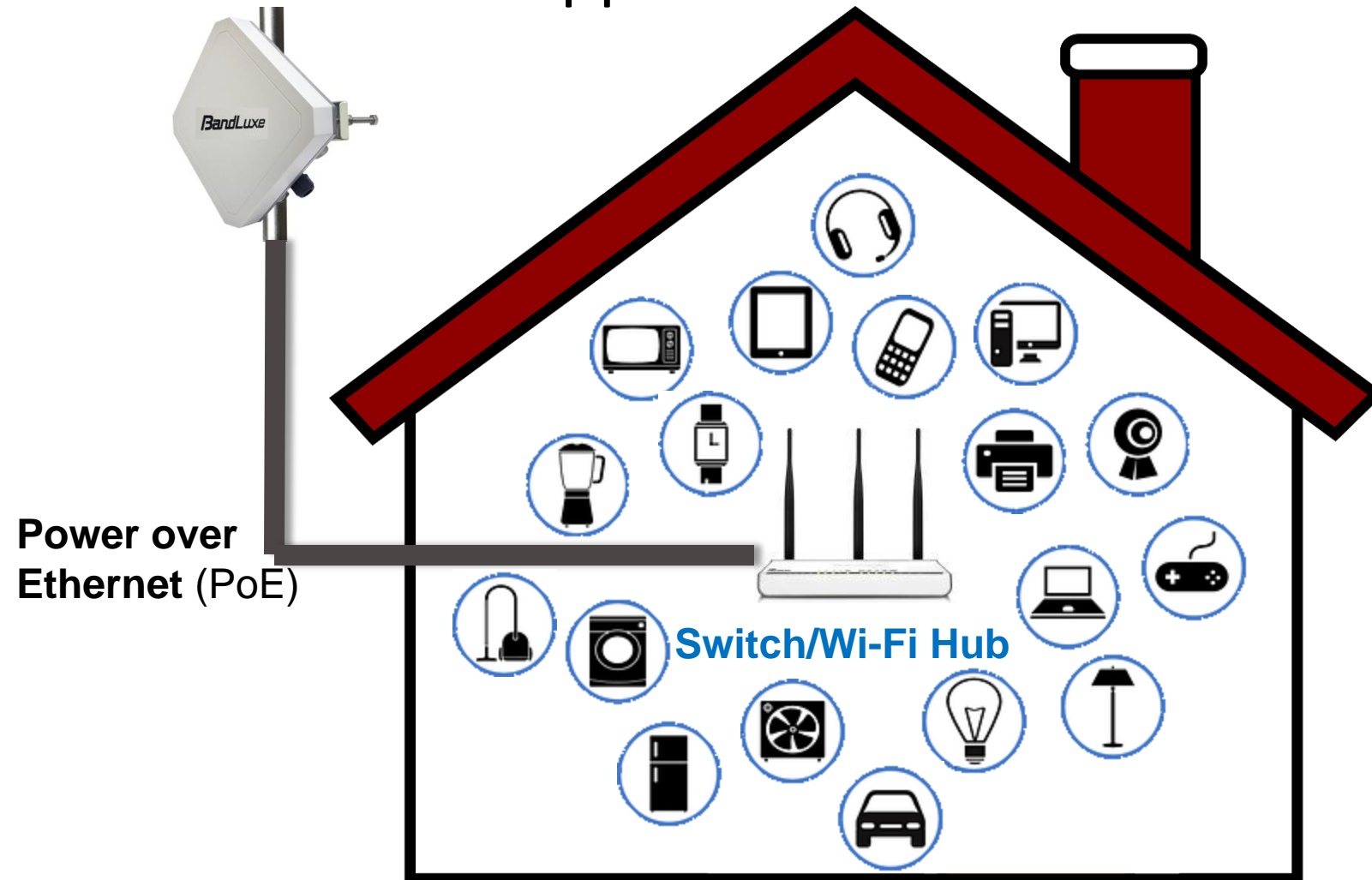
IoT Relay Application - SIM Based

Smart Water Meter

Smart Gas Meter

Smart Power Meter

Indoor Cellular Service

Microcell

BandRich Inc.
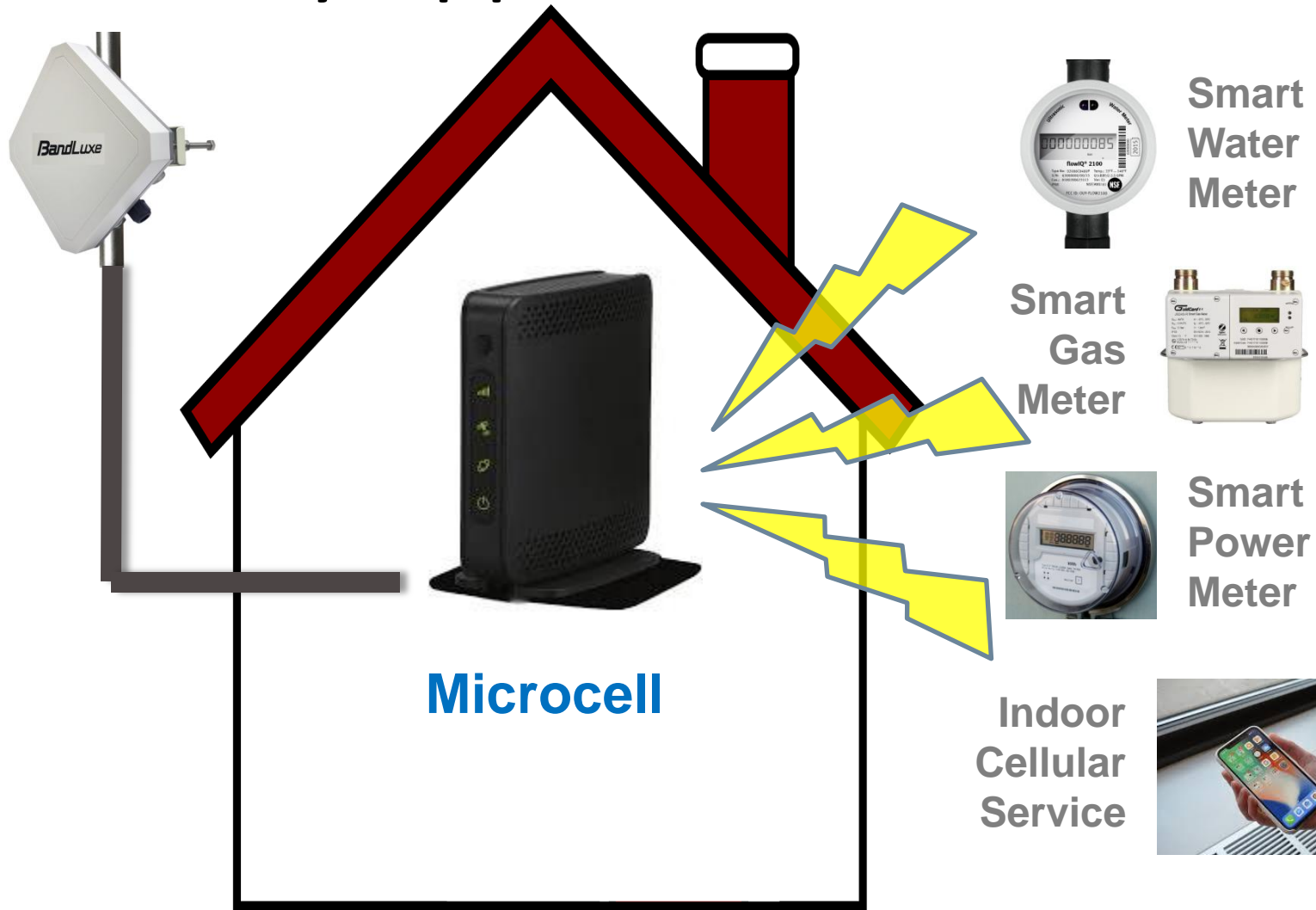
Application– Solar Powered

- For the most remote area. Solar panel is the only power source
- E600 consumes less than 5 W in normal status. Even when the built-in heater kicks in it only consumes less than 30 W.
- Picture is from Australia and the ODU is about 22km(about 13.7 miles) away from tower
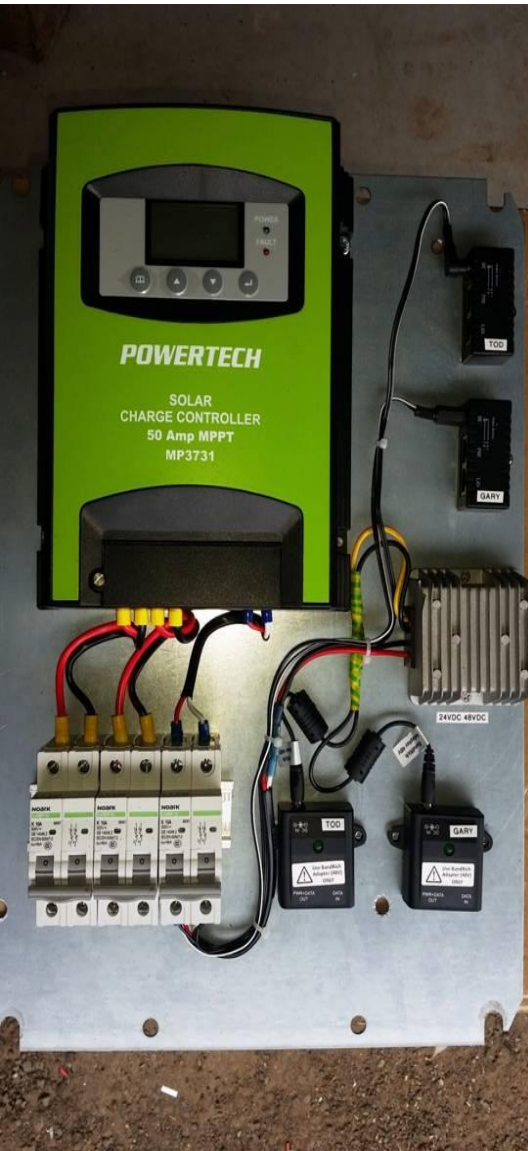
William,
Pictures attached.

1. Base station is located 22 Km from E600A high up on a distant hill.
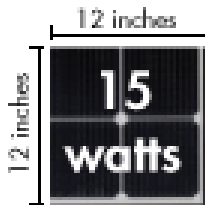
12 inches
12 inches
15 watts
= 1 square foot

LTE Relay to the Microwave/Solar panel provide the power

After-sale Service

- Jack Wu, local tech support in US

- RMA cases will be handle in the US to shorten the turn around time. Typically less than three days from the day of receiving.

- Warranty: ONE (1) YEAR from the date of shipping

BandRich Roadmap

18 Q3	18 Q4	19 Q1	19 Q2

E600/E600A, Cat 6 ODU, 2CA, DL 300/UL 50

E700/E700A, Cat 12 ODU, 3CA, DL 600/UL 150

5G Products

In Production

NB-IoT Products

Planned

- E600/E600A is in production and current lead time is about 10 business days
- E700/E700A working sample available in 19Q1

BandRich Inc.

Installation Case(I) – Michigan State

On Wed, Jun 20, 2018 at 2:14 PM, Dennis ███████████████████
wrote:

> With ising the different carries lately verizon seems to be the only one that works reliability most of the time do u have any cost effective options that will work with 3 verizon cellular modems i have found a couple that would be nice but they start at 4000 to 5000 for just the hardware. Im trying to find aomething 1000 or less?

On Wed, Jun 20, 2018 at 4:19 PM, Dennis ███████████████████ wrote:

> What speed do u think educated guess at least a decent 4g connection? 2 M byte per second? With verizon where im at i can normaly get 4 or more unless its like a holiday when every one is on. At night its way fast but with tethering im limited to 15 gigs then its chopped to 60 kilobytes a second which is unusable even for email because of all the adds and pictures they use on every thing.

Installation Case(I) – Michigan State
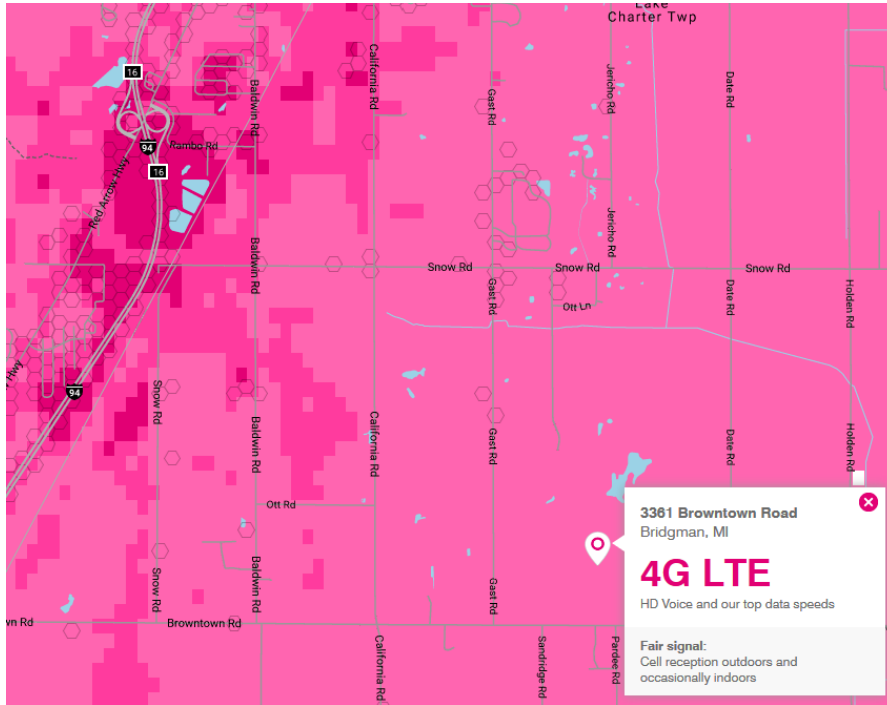
- T-Mobile fair signal area: **cell reception outdoors and occasionally indoors.**

- 2.5 miles away from T-Mobile tower located at NW.

- Customer installed E600 by himself.

Happy customer here after.

Installation Case(I) – Michigan State

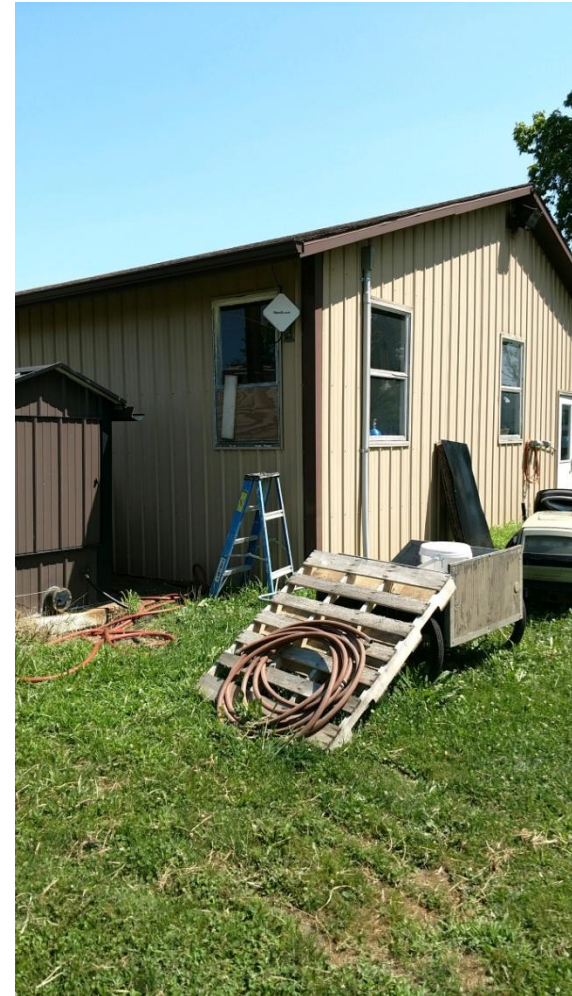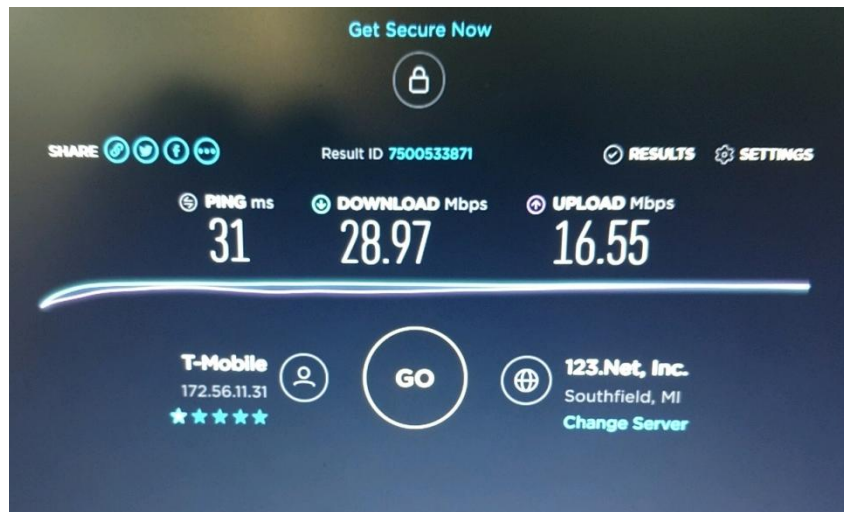# Installation Case(II) – Texas State
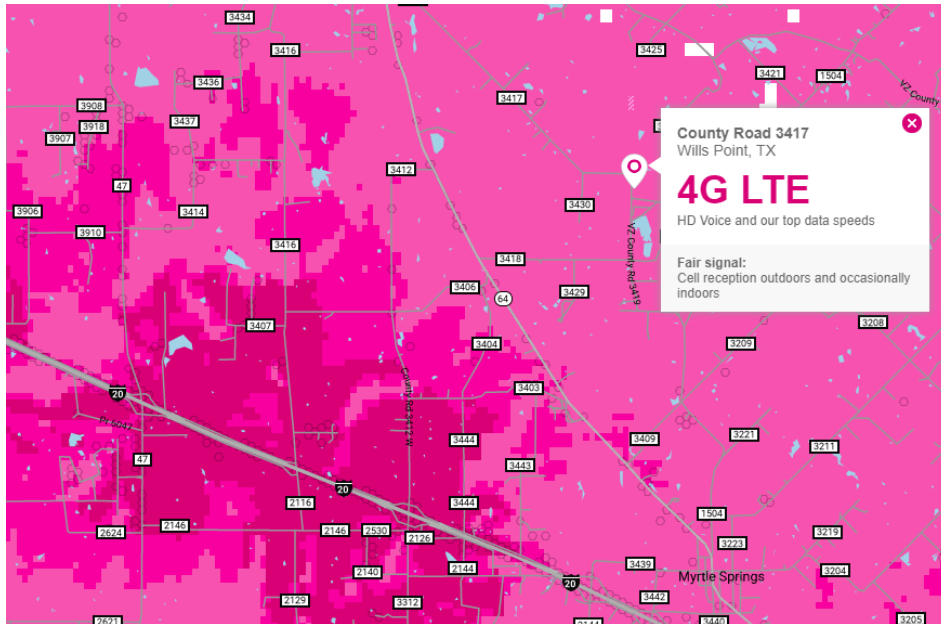
- T-Mobile fair signal area: **cell reception outdoors and occasionally indoors.**

- 3.5 miles away from T-Mobile tower located at SW.

- Customer installed E600 by himself.

Happy customer here after, too.

Installation Case(II) – Texas State

Installation Case(III) – Utah State

- 2 miles away from Sprint tower located at NE.

BandRich Inc.
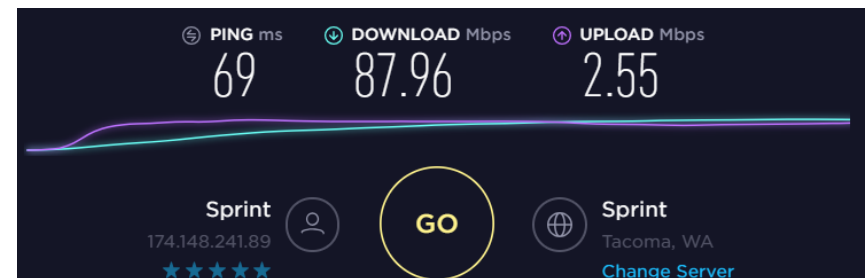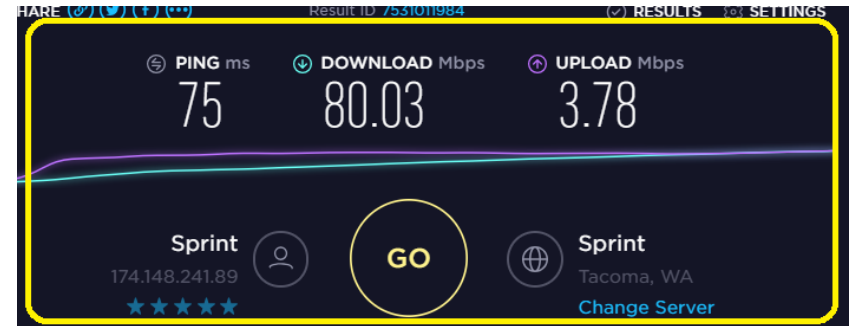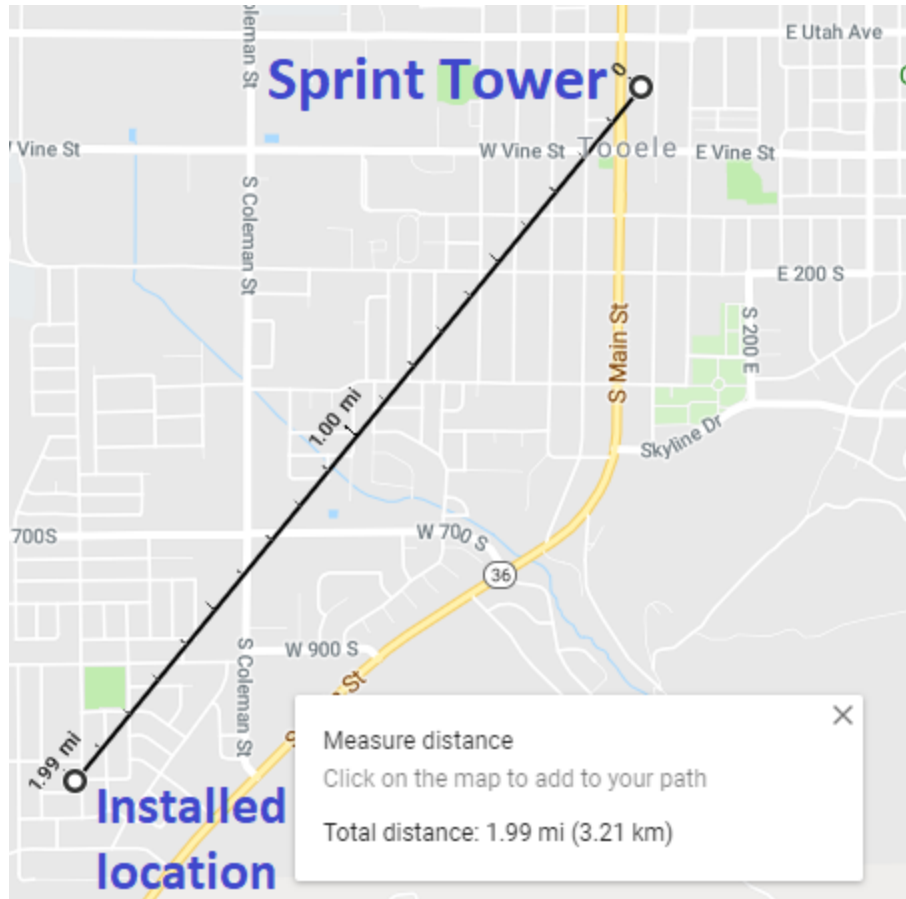
Installation Case(III) – Utah State

- Good internet solution for outskirts where customers don't have many landline choices

Installation Case(IV) – Australia

Very far between ODU and Base station

- **Robust IP66 housing with built-in heater for any environments**
- **50km(about 31miles) away from tower. DL 35Mbps/UL 17Mbps**

Distance and Altitude between Base Station and ODU

E800 support bands

5G Band	1,2,3,5,7,8,12,20,28,41,66,71,77,78
5G Bandwidth	Up to 100 MHz
5G Data Rate	1Gbps at Downlink, 450mbps at Uplink
LTE Band	1,2,3,4,5,7,8,12,13,14,17,20,25,26,28,29,30,32,38,40,41,42,43,66
LTE Rate	LTE CAT 20

E700	LTE Band	B1, B2, B3, B4, B5, B7, B8, B9, B12, B13, B18, B19,B20,B26,B28,B29,B30,B32,B41,B42,B43,B46,B48,B66(MFBI supported)		
	LTE Bandwidth	Up to 60 MHz(3 CA)		
	LTE Data Rate	Downlink up to 600 Mbps Uplink up to 150 Mbps		
	WCDMA Band	B1, B2, , B4, B5, B6,B8,B9,B19		
	WCDMA Rate	Downlink:42Mbps, Uplink:5Mbps		
E600	LTE Band	B1, B2, B3, B4, B5, B7, B8, B12, B13, B20, B25, B26, B29,B30,B41(MFBI supported)		
	LTE Bandwidth	Up to 40 MHz(2 CA)		
	LTE Data Rate	Downlink up to 300 Mbps Uplink up to 50 Mbps		
	WCDMA Band	B1, B2, B3, B4, B5, B8		
	WCDMA Rate	Downlink:42Mbps, Uplink:5Mbps		
E600A	LTE Band	B1, B3, B5, B7, B7, B8, B11, B18, B19, B21, B28, B38,B39,B40,B41(MFBI supported)		
	LTE Bandwidth	Up to 40 MHz(2 CA)		
	LTE Data Rate	Downlink up to 300 Mbps Uplink up to 50 Mbps		
	WCDMA Band	B1, B5, B6, B8, B9, B19		
	WCDMA Rate	Downlink:42Mbps, Uplink:5Mbps		

E700A	LTE Band	B1, B2, B3, B4, B5, B7, B8, B9, B12, B13, B14,B18, B19,B20,B26,B29,B30,B32,B41,B42,B43,B46,B48,B66(MFBI supported)		
	LTE Bandwidth	Up to 60 MHz(3 CA)		
	LTE Data Rate	Downlink up to 600 Mbps Uplink up to 150 Mbps		
	WCDMA Band	B1, B2, , B4, B5, B6,B8,B9,B19		
	WCDMA Rate	Downlink:42Mbps, Uplink:5Mbps		

E600 support CA table

LTEB1: B8,
LTEB2: B2, B5, B12, B13, B29,
LTEB3: B7, B20,
LTEB4: B4, B5, B12, B13, B29,
LTEB5: B2, B4, B30,
LTEB7: B3, B7, B20,
LTEB8: B1,
LTEB12: B2, B4, B30,
LTEB13: B2, B4,
LTEB20: B3, B7,
LTEB25:
LTEB26:
LTEB29:
LTEB30: B5, B12,
LTEB41: B41,

E600A support CA table

```
LTEB1: B8, B18, B19, B21,
LTEB3: B5, B7, B19, B28,
LTEB5: B3, B7,
LTEB7: B3, B5, B7, B28,
LTEB8: B1,
LTEB18: B1,
LTEB19: B1, B3, B21,
LTEB21: B1, B19,
LTEB28: B3, B7,
LTEB38: B38,
LTEB39: B39,
LTEB40: B40,
LTEB41: B41,
```

```
12A_30A_66A:12A,30A,66A    13A_66A_66A:13A,66A        13A_66B:13A,66A
19A_42C:19A                1A_3A_19A:1A,3A,19A        1A_3A_20A:1A,3A,20A
1A_3A_28A:1A,3A,28A        1A_3A_5A:1A,3A,5A          1A_3A_7A:1A,3A,7A
1A_3A_8A:1A,3A,8A          1A_42C:1A                  1A_5A_7A:1A,5A,7A
1A_7A_20A:1A,7A,20A        1A_7A_7A:1A,7A             29A_30A_66A:30A,66A
2A_12A_30A:2A,12A,30A      2A_13A_66A:2A,13A,66A      2A_29A_30A:2A,30A
2A_2A_12A:2A,12A           2A_2A_13A:2A,13A           2A_2A_5A:2A,5A
2A_4A_12A:2A,4A,12A        2A_4A_13A:2A,4A,13A        2A_4A_29A:2A,4A
2A_4A_5A:2A,4A,5A          2A_4A_7A:2A,4A,7A          2A_5A_30A:2A,5A,30A
2A_5A_66A:2A,5A,66A        2A_66A_66A:2A,66A          2A_66B:2A,66A
2A_66C:2A,66A              2A_7A_12A:2A,7A,12A        2A_7A_7A:2A,7A
3A_3A_7A:3A,7A             3A_41A_42A:3A              3A_41C:3A
3A_42C:3A                  3A_7A_20A:3A,7A,20A        3A_7A_28A:3A,7A,28A
3A_7A_7A:3A,7A             3A_7B:3A,7A                3A_7C:7C,3A
3C_20A:3A,20A              3C_28A:3A,28A              3C_5A:3A,5A
3C_7A:3C,7A                41A_42C:41A,42A            41C_42A:41A,42A
41D:41C                    4A_12A_30A:4A,12A,30A      4A_29A_30A:4A,30A
4A_4A_12A:4A,12A           4A_4A_13A:4A,13A           4A_4A_30A:4A,30A
4A_4A_5A:4A,5A             4A_5A_30A:4A,5A,30A        4A_7A_12A:4A,7A,12A
4A_7A_7A:4A,7A             5A_30A_66A:5A,30A,66A      5A_66A_66A:5A,66A
5A_66B:5A,66A              5A_66C:5A,66A              66A_66B:66A
66A_66C:66A                7B_28A:7A,28A              7C_28A:7C,28A
12A_30A:12A,30A            12A_66A:12A,66A            13A_46A:13A
19A_42A:19A                1A_18A:1A,18A              1A_19A:1A,19A
1A_20A:1A,20A              1A_26A:1A,26A              1A_3A:1A,3A
1A_41A:1A                  1A_42A:1A                  1A_5A:1A,5A
1A_7A:1A,7A                1A_8A:1A,8A                20A_32A:20A
28A_42A:28A                29A_30A:30A                29A_66A:66A
2A_12A:2A,12A              2A_13A:2A,13A              2A_28A:2A,28A
2A_29A:2A                  2A_2A:2A                   2A_30A:2A,30A
2A_46A:2A                  2A_4A:2A,4A                2A_5A:2A,5A
2A_66A:2A,66A              2C:2A                      30A_66A:30A,66A
3A_19A:3A,19A              3A_20A:3A,20A              3A_28A:3A,28A
3A_3A:3A                   3A_41A:3A                  3A_42A:3A
3A_5A:3A,5A                3A_7A:3A,7A                3A_8A:3A,8A
3C:3C                      41A_42A:41A,42A            41C:41C
42C:42A                    4A_12A:4A,12A              4A_13A:4A,13A
4A_28A:4A,28A              4A_29A:4A                  4A_30A:4A,30A
4A_46A:4A                  4A_4A:4A                   4A_5A:4A,5A
4A_7A:4A,7A                5A_30A:5A,30A              5A_46A:5A
5A_66A:5A,66A              5A_7A:5A,7A                5B:5A
7A_12A:7A,12A              7A_20A:7A,20A              7A_28A:7A,28A
7A_7A:7A                   7B:7A                      7C:7C
48C:48A                    48D:48A                    48A_48A:48A
48A_48C:48A
```

E700A support CA table

```
12A_30A_66A:12A,30A,66A    13A_66A_66A:13A,66A        13A_66B:13A,66A
13A_66C:13A,66A            19A_42C:19A                1A_3A_19A:1A,3A,19A
1A_3A_20A:1A,3A,20A        1A_3A_5A:1A,3A,5A          1A_3A_7A:1A,3A,7A
1A_3A_8A:1A,3A,8A          1A_42C:1A                  1A_5A_7A:1A,5A,7A
1A_7A_20A:1A,7A,20A        1A_7A_7A:1A,7A             29A_30A_66A:30A,66A
2A_12A_30A:2A,12A,30A      2A_13A_66A:2A,13A,66A      2A_29A_30A:2A,30A
2A_2A_12A:2A,12A           2A_2A_13A:2A,13A           2A_2A_5A:2A,5A
2A_4A_12A:2A,4A,12A        2A_4A_13A:2A,4A,13A        2A_4A_29A:2A,4A
2A_4A_5A:2A,4A,5A          2A_4A_7A:2A,4A,7A          2A_5A_30A:2A,5A,30A
2A_5A_66A:2A,5A,66A        2A_66A_66A:2A,66A          2A_66B:2A,66A
2A_66C:2A,66A              2A_7A_12A:2A,7A,12A        2A_7A_7A:2A,7A
3A_3A_7A:3A,7A             3A_41A_42A:3A              3A_41C:3A
3A_42C:3A                  3A_7A_20A:3A,7A,20A        3A_7A_7A:3A,7A
3A_7B:3A,7A                3A_7C:7C,3A                3C_20A:3A,20A
3C_5A:3A,5A                3C_7A:3C,7A                41A_42C:41A,42A
41C_42A:41A,42A            41D:41C                    48A_48C:48A
48D:48A                    4A_12A_30A:4A,12A,30A      4A_29A_30A:4A,30A
4A_4A_12A:4A,12A           4A_4A_13A:4A,13A           4A_4A_30A:4A,30A
4A_4A_5A:4A,5A             4A_5A_30A:4A,5A,30A        4A_7A_12A:4A,7A,12A
4A_7A_7A:4A,7A             5A_30A_66A:5A,30A,66A      5A_66A_66A:5A,66A
5A_66B:5A,66A             5A_66C:5A,66A               66A_66B:66A
66A_66C:66A               12A_30A:12A,30A             12A_66A:12A,66A
13A_46A:13A               19A_42A:19A                 1A_18A:1A,18A
1A_19A:1A,19A             1A_20A:1A,20A               1A_26A:1A,26A
1A_3A:1A,3A               1A_41A:1A                   1A_42A:1A
1A_5A:1A,5A               1A_7A:1A,7A                 1A_8A:1A,8A
20A_32A:20A               29A_30A:30A                 29A_66A:66A
2A_12A:2A,12A             2A_13A:2A,13A               2A_29A:2A
2A_2A:2A                  2A_30A:2A,30A               2A_46A:2A
2A_4A:2A,4A               2A_5A:2A,5A                 2A_66A:2A,66A
2C:2A                     30A_66A:30A,66A             3A_19A:3A,19A
3A_20A:3A,20A             3A_3A:3A                    3A_41A:3A
3A_42A:3A                 3A_5A:3A,5A                 3A_7A:3A,7A
3A_8A:3A,8A               3C:3C                       41A_42A:41A,42A
41C:41C                   42C:42A                     48A_48A:48A
48C:48A                   4A_12A:4A,12A               4A_13A:4A,13A
4A_29A:4A                 4A_30A:4A,30A               4A_46A:4A
4A_4A:4A                  4A_5A:4A,5A                 4A_7A:4A,7A
5A_30A:5A,30A             5A_46A:5A                   5A_66A:5A,66A
5A_7A:5A,7A               5B:5A                       7A_12A:7A,12A
7A_20A:7A,20A             7A_7A:7A                    7B:7A
7C:7C
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