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# CFISD

## Wi-Fi for Disadvantaged Students Pilot

November 2017

# Goals, Challenges, Advantages

## Goals

- ✓ Provide disadvantaged students with access to district network resources and Internet via remote Wi-Fi
- ✓ Provide same user experience and network security that the students experience at school
- ✓ Flexibility to provide this remote access to any disadvantaged area in the district

## Challenges

- ✓ Providing power to remote APs can be a challenge
- ✓ Not all disadvantaged areas are within line of site to a school – mesh is not always an option
- ✓ Any remote solution must be reliable
- ✓ Must be as secure as classroom AP access

## Advantages of Proposed Pilot

- ✓ Remote solution is Solar Powered. No external power required
- ✓ Solution can be implemented anywhere 4G service is available
- ✓ Line of sight is not required
- ✓ Aruba RAP solution has a proven track record and has been in production for years
- ✓ Access roles for remote solution are the same as for student in Wi-Fi connected classroom

# Solution Components



## Solis Solar Power Plant & Cabinet

- ✓ Solar Power Plant
- ✓ 3 day battery charge
- ✓ PoE+ Injector for Aruba AP-275
- ✓ Locking cabinet for housing
- ✓ Cradlepoint 4G Router

## Cradlepoint IBR950 Hardened 4G Router

- ✓ LAN to 4G Wan
- ✓ Works with multiple 4G providers
- ✓ Hardened -  $-22^{\circ}$  F to  $+158^{\circ}$  F

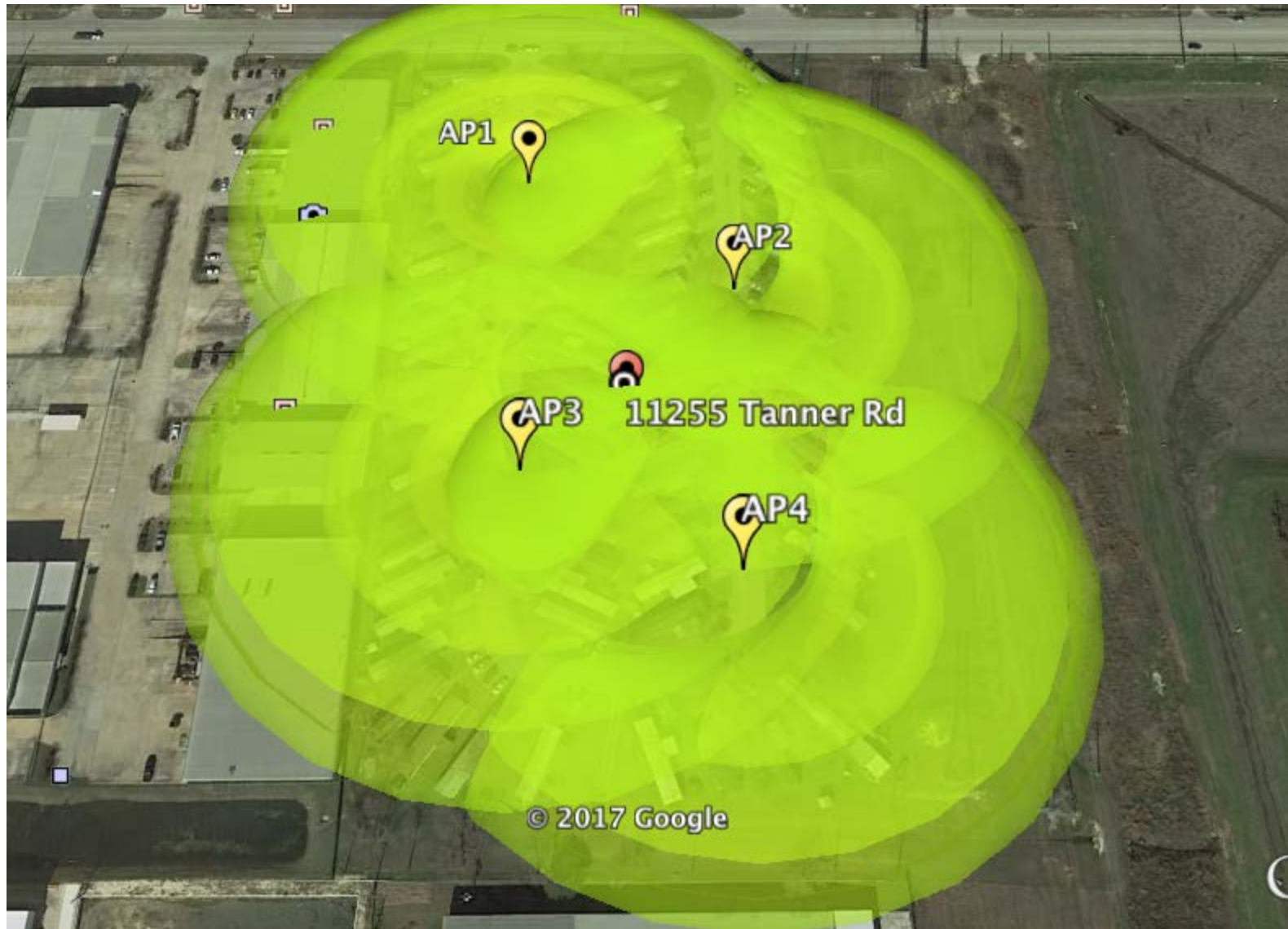
## Aruba IAP-275

- ✓ Configured as RAP
- ✓ Builds VPN tunnel to district controller through 4G router
- ✓ Same security as indoor APs
- ✓ Clearpass authentication for user access
- ✓ Large coverage area

# Tanner Road AP Placement



# Tanner Road Coverage Map -75dbm and Greater



# Online tools used at Home:

Students will login to the CFISD SSID using standard CFISD student credentials.

Software/Applications expected to be utilized at home:

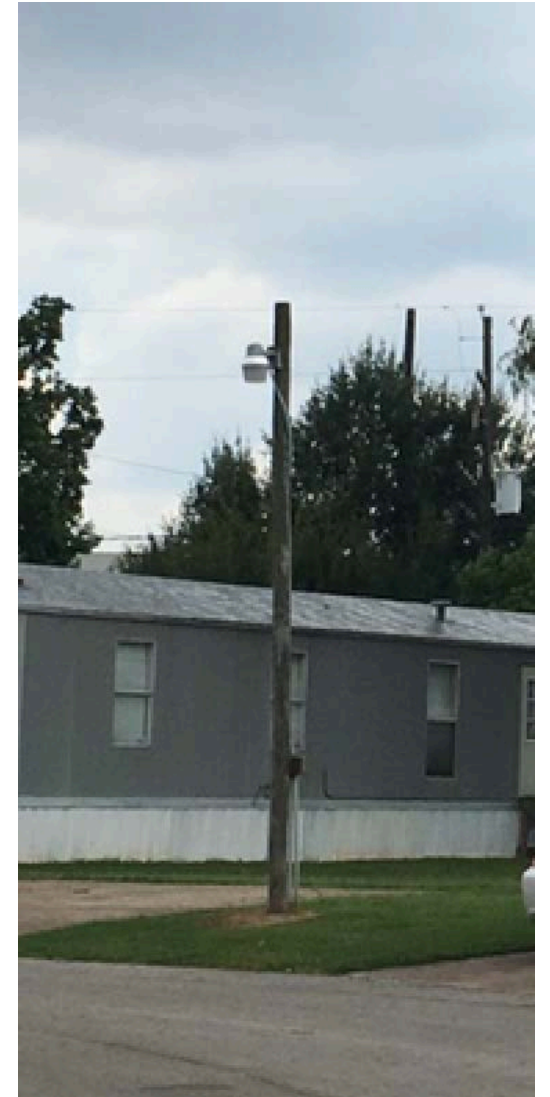
- Access Google as that is where their homework assignments are located
- Access teacher specific web resources
- Access library resources, myon
- Access instructional games for math and spelling
- Interactive Textbooks
- Audio streaming
- Some video streaming
- Access state related websites for testing of math, science, reading, and writing

Secondary Social Studies: Law Related Education – Moodle for 11<sup>th</sup> grade history

PreK, Kindergarten, and First Grade (all content) - Starfall.com

Secondary Science: Google Classroom, Classflow, The Jason Project, Explore Learning/Gizmos, NBC Learn, Stemsopes, Library Resources, Phet, Khan Academy,

# Utilize existing Poles for Mounting as is feasible:



# Pricing:

CFISD Aruba Networks IAP 275 Tower Solution DIR TSO 2679						
Item	Quantity	Part Number	Description	Unit List Price	Unit Cost	Extended Cost
1	1	JW255A	Aruba Instant IAP-275 (US) 802.11n/ac Dual 3x3:3 Radio Integrated Omni Antenna Outdoor AP	\$ 1,995.00	\$ 977.55	\$ 977.55
2	1	H4BE1E	Aruba 1Y FC NBD Exch IAP 275 SVC [for JW255A]	\$ 88.00	\$ 79.20	\$ 79.20
3	1	JW053A	AP-270-MNT-V2 AP-270 Series Outdoor Pole/Wall Short Mount Kit	\$ 125.00	\$ 61.25	\$ 61.25
4	1	JW079A	CKIT-OD-AC-P MST2HAC and AP-27x Custom AC Power Cable Connector Assembly Kit	\$ 55.00	\$ 26.95	\$ 26.95
5	1	6734	Pole, Galv, 4.5"x15', SCH 40	\$ 785.00	\$ 685.00	\$ 685.00
6	1	1000308	Light Pole Base - Round 24"x 7' 2,750 lbs -	\$ 415.00	\$ 410.00	\$ 415.00
7	1	IBR950	Ruggedized 3G/4G LTE router designed for advanced in-vehicle & high-performance M2M/IoT connectivity.	\$ 799.00	\$ 762.00	\$ 762.00
8	1	L3C-MTCE	Layer 3 Communications Pro Services - includes onsite site visits and testing once a year.	\$ 1,750.00	\$ 1,250.00	\$ 1,250.00
9	1	SPP12150-E	Solar Power Plant, 12V, 150W, Enclosure Type E	\$ 3,229.00	\$ 2,938.00	\$ 2,938.00
10	1	3 Year Warranty	Extended Warranty Add-On Option	\$ 323.00	\$ 295.00	\$ 295.00
11	12	VZW	Monthly Data Plan/DIR	\$ 37.99	\$ 37.99	\$ 455.88
12	1	L3C-IMPL	Layer 3 Communications Pro Services - AP implementation services, including mounting Installation and provisioning of Aruba outdoor instant access point, including installation and provisioning of Aruba AP 275 Series indoor access point, integration with Airwave Management, provisioning of Aruba AP including post installation support, documentation, and 1 year onsite replacement. (Access Point/ lifetime warranty)	\$ 550.00	\$ -	\$ -
13	1	L3C-MIN	Minor materials and miscellaneous expenses for the tower construction and installation. (incl. lift rental)	\$ 3,750.00	\$ 2,500.00	\$ 2,500.00
14	1	L3C-PS	Layer 3 Communications Pro Services - Turnkey implementation services: includes implementation of the mounting pole, router, LTE modem, configuration, and post implementation support.	\$ 7,500.00	\$ 4,475.00	\$ 4,475.00
					<b>Total:</b>	<b>\$ 14,920.83</b>
					<b>Shipping and Handling</b>	<b>\$ -</b>
					<b>Total:</b>	<b>\$ 14,920.83</b>



# Recurring Costs:

Item	Quantity	Part Number	Description	Unit List Price	Unit Cost	Extended Cost
1	1	L3C-MTCE	Layer 3 Communications Pro Services - includes onsite site visits and testing once a year.	\$ 1,750.00	\$ 1,250.00	\$ 1,250.00
2	12	VZW	Monthly Data Plan/DIR	\$ 37.99	\$ 37.99	\$ 455.88
3	1	H4BE1E	Aruba 1Y FC NBD Exch IAP 275 SVC [for JW255A]	\$ 88.00	\$ 79.20	\$ 79.20
4	1	L3C-SPPT	Replacing defective or broken hardware. (does not include cost of materials) Replacement within 48 hours of notification.	\$ 1,250.00	\$ 1,175.00	\$ 1,175.00
5	12	VZW	Monthly Data Plan/DIR	\$ 37.99	\$ 37.99	\$ 455.88
<b>Total:</b>						<b>\$ 3,415.96</b>
<b>Shipping and Handling</b>						<b>\$ -</b>
<b>Total:</b>						<b>\$ 3,415.96</b>

## **Implementation Timeline:**

**Order equipment for proof of concept**

**- 2 weeks for equipment to arrive)**

**Test in controlled environment – 2-4 weeks**

**Upon successful testing, order complete solutions**

**- 2 to 3 weeks for equipment to arrive**

**Implementation/testing at end user location(s)**

**- 2-4 weeks**

**Testing/fine tuning**

**- 2 weeks**

**Total timeframe for implementation:**

**- 15 weeks**