Product Requirements Doc – PlantMESH 2.0

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I. Global System Capabilities, Features & Parameters

A. Online software purchase and download

B. No IP Space default (Virtual Wire)*

1. Ideally standard PlantMESH systems would not utilize customer IP address space.

a) Unknown: In this configuration, can we still do things like bandwidth throttling, determine which IP addresses customer devices are using back in the MeshCORE, know which customer devices are on which node, etc., etc.

b) Can MeshCORE be DHCP server or forwarder for customer devices?

c) Can MeshCORE be DHCP client?

2. SSID (if being broadcast), remains the same across entire PlantMESH segment

3. Will computers automatically AND dynamically select the strongest signal; or to paraphrase, how will computers that are connecting wirelessly actually switch from AP to AP?

C. Zero Config for non MeshCORE Models*

1. Plug new node (STATION, LINK OR NODE) into MeshCORE and all settings for current mesh are transferred over CAT5 cable

2. LED on CORE and NODE need to indicate programming beginning, running and ending

3. New node authorization in PlantVIEW

a) Time based

b) Interval based

c) Always open

D. Functional upgrades*

E. PlantVIEW Supervisory Software*

1. All system functions configured through PlantVIEW

2. Trending/Charting Package^

3. Reports Package^

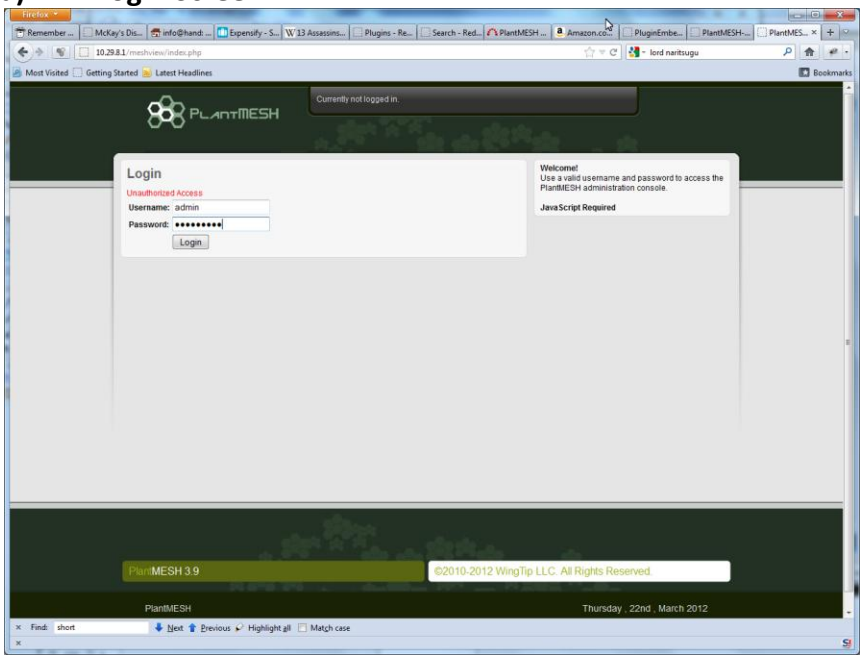
4. Changes in configuration need a “Save & Reboot,” “Save Only” buttons

5. All quickstart documentation and help files contained in PlantVIEW

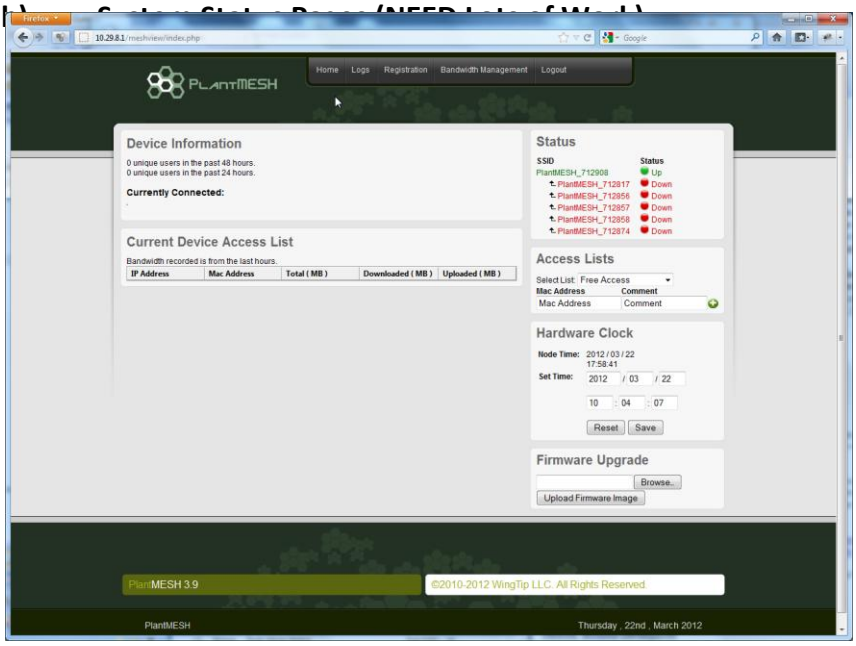
6. SSL Capability

7. Utilize LuCi but skin for PlantMESH (All images are examples of what it could look like, not final)

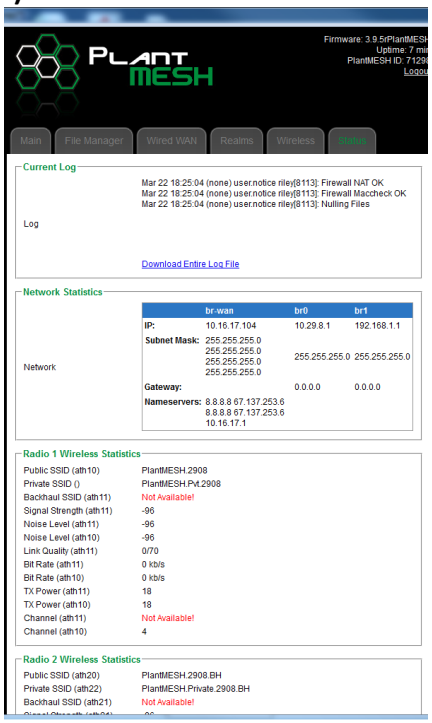
a) Login Screen



b) [illegible]



c) More Info that should be in PlantVIEW



F. Hyper Efficient Mesh*

1. **Routing done via discovery algorithm**

2. **Once route determined, each node carries preferred routing table**

3. **If preferred route down, tries backup routes**

4. **Discovery algorithm is low bandwidth**

5. **Quick recover in event of route failure: less than 30 seconds**

G. Security*

1. **ZeroConf Node Addition**

2. **Sniff proof (no key transmission)**

3. **256 Bit Encryption (selectable)**

H. Dedicated Backhaul*

1. **Models**

   a) **MeshCORE**

   b) **MeshSTATION**

2. **Backhaul Frequencies**

   a) **5.8**

   b) **2.4**

      (1) This would be helped by TDMA

   c) **900**

I. TDMA***

1. **Large Mesh Quantities**

2. **Higher speeds**

3. **Adjoining Mesh and WiFi Network segmentation**

J. Notification System**^

1. **Notification Types**

   a) **Alarms – Items Needing Intervention**

      (1) Bandwidth throttling engaged

      (2) Node down for x length of time

b) Events – Items Worth Noting

(1) Node down

(2) Node Bandwidth exceeding specified limit

(3) System Bandwidth exceeding specified limit

2. Notification Methods

a) Email

(1) SMTP

(2) SMTP with SSL**

b) SNMP***

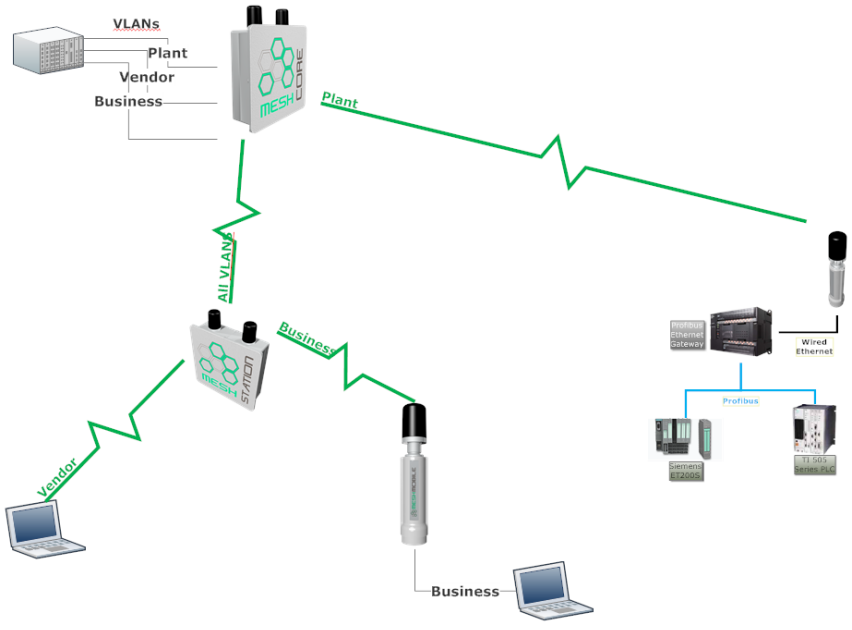
c) Alarm Screen in PlantVIEW**

K. Remote Technical Support**^

L. Multiple VLAN in / Multiple VLAN out***^

1. Physical CAT5 Ports as end points for each VLAN

2. Up to 4 VLANs



3.

M. Multiple VAP**^

1. **Up to 4 individually accessible wireless networks on same PlantMESH system**

2. **Each VAP carries VLAN tagging from upstream network*****

3. **Each VAP can be designated at Nodes for physical landing of VAP/VLAN*****

N. **Real Time Clock w/battery backup***

O. **NTP sync***

P. **NTP relay/service***

Q. **Firewall & NAT module**^**

R. **Backup for System Config***

S. **Bandwidth throttling**

1. **Per node**

2. **Per system**

3. **Average**

4. **Spike**

T. **IGMP Snooping on per node basis**

II. **Global Usage Cases**

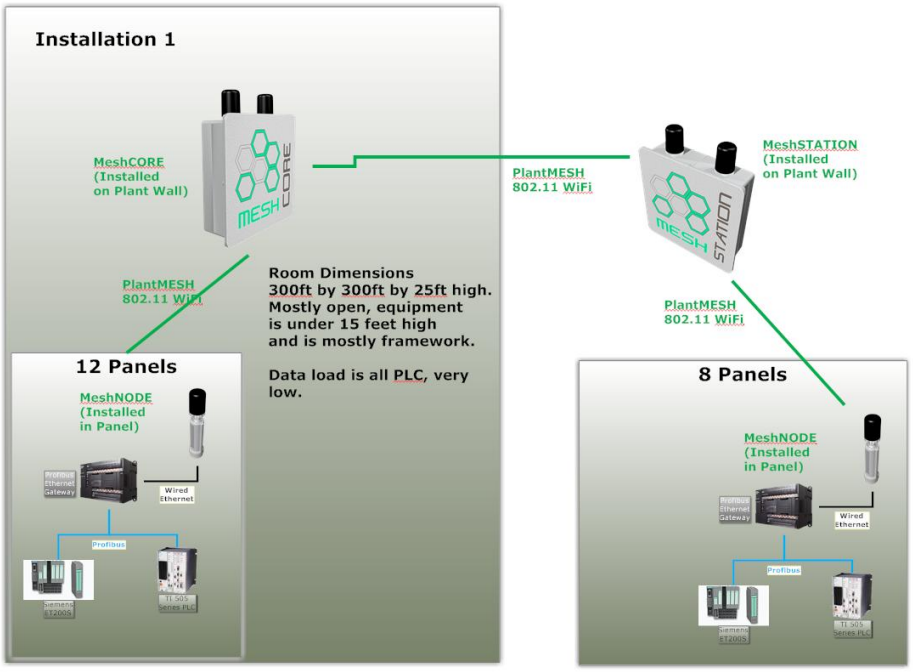
A. **Bridging devices***

1. **Each MeshNODE is a bridge for equipment, devices, computers**

2. **MeshNODEs do NOT function as APs**

3. **Example Bridging Application**

a)

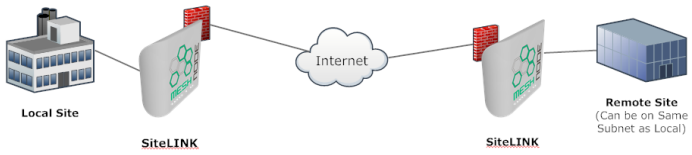


4. n

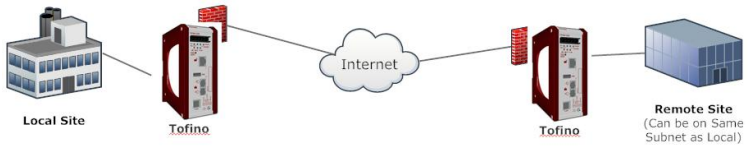
B. Site to Site, LOS*

1. MeshLINK to MeshLINK
2. 4-8 Miles Line Of Sight (LOS)
3. Ethernet Cable in / Ethernet Cable Out

C. Site to Site over internet

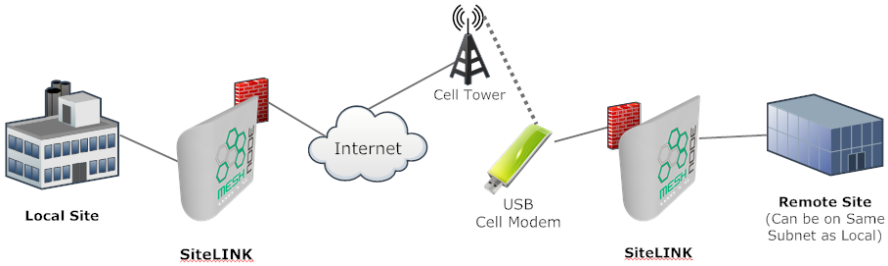
1. VPN
2. 

D. Site to Site, internet, NERC Approved

1. VPN, Handled by Tofino (no requirements for Cozybit currently)
2. 

E. Site to Site over cellular internet

1. **Site to Site Link using Cellular modem from one of carriers**



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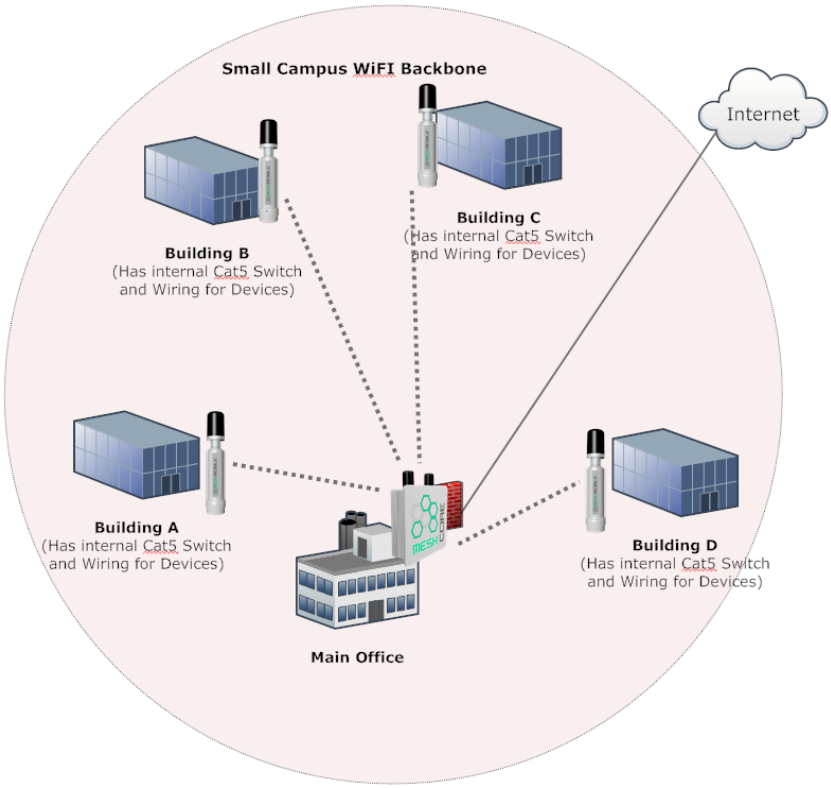
F. Small Campus Backbone*

1. **Each building in this scenario has internal hard wiring and switching, it just needs a backbone to get to the WAN**



2.

G. Airport virtual wire

1. **All must be 2.4 unless we have radar detection, including backhauls**

2. **TDMA would work best for this application, because:**

   a) **5.8 can't be deployed without radar detection**

   b) **Most airports have wifi for customers**

H. HMI-Laptop Roaming

1. **MeshCORE and MeshSTATIONS scattered around plant. User has a laptop, laptop needs to switch between APs as user moves around. This should only work in the Virtual Wire scenario.**

III. Models

A. MeshCORE

1. **Green LED Info**
    a) **What does it do on startup**
    b) **What does it do in run mode**
2. **Can be DHCP client**
3. **Can be DHCP server**
4.

B. MeshSTATION*

C. MeshLINK*

D. MeshNODE*

E. MeshMOBILE*

1. **Fast switching firmware**
2. **Accept: less than 2 second switch**
3. **Desired: less than .5 second switch**

F. MeshULINK***

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2. **Has Cellular Option**

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1. **Cellular modem shippable tech support modem**

IV. Note Definition

A. *** Needed for Initial Release**

B. **** Desired in initial release**

C. ***** Future release but will impact sales**

D. ****** Sounds like a good idea**

E. **^ Will be Upsell Option**