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TOPICS

MESH ARCHITECTURE: 1st, 2nd, and 3rd GENERATION MESH NODES

MODULAR MESH FRAMEWORK

BACKHAUL-ONLY MESH NODES

MESH NODES WITH 2.4GHz SERVICE RADIOS

RELAY MESH NODES WITH MULTIPLE DOWNLINK RADIOS

ROOT MESH NODES WITH MULTIPLE DOWNLINK RADIOS

MOBILE MESH NODES

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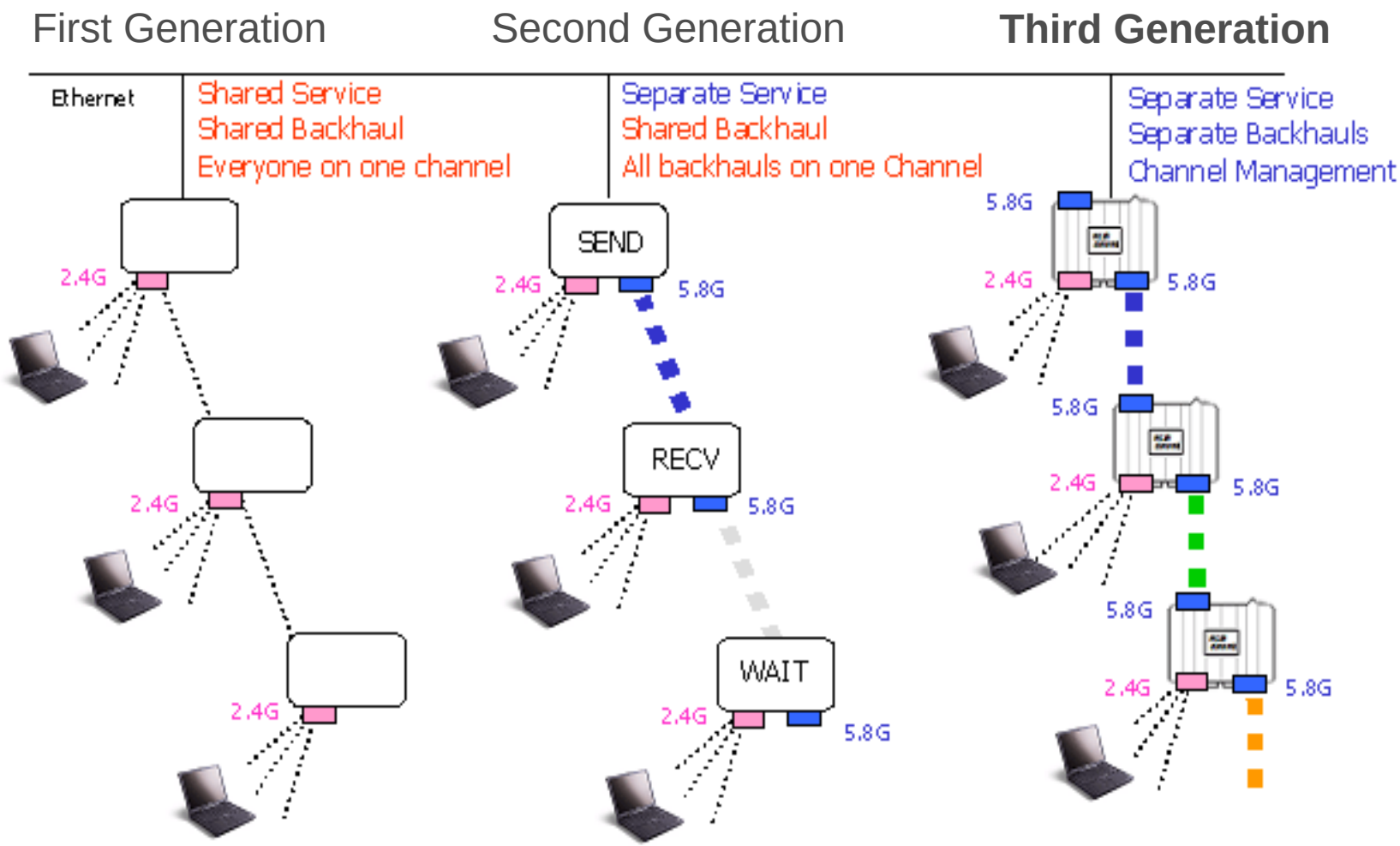
MESHDYNAMICS USES 3RD GENERATION MESH TECHNOLOGY



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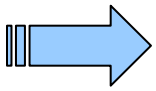
MESH ARCHITECTURE: 1st, 2nd, and 3rd GENERATION MESH NODES



MODULAR MESH FRAMEWORK

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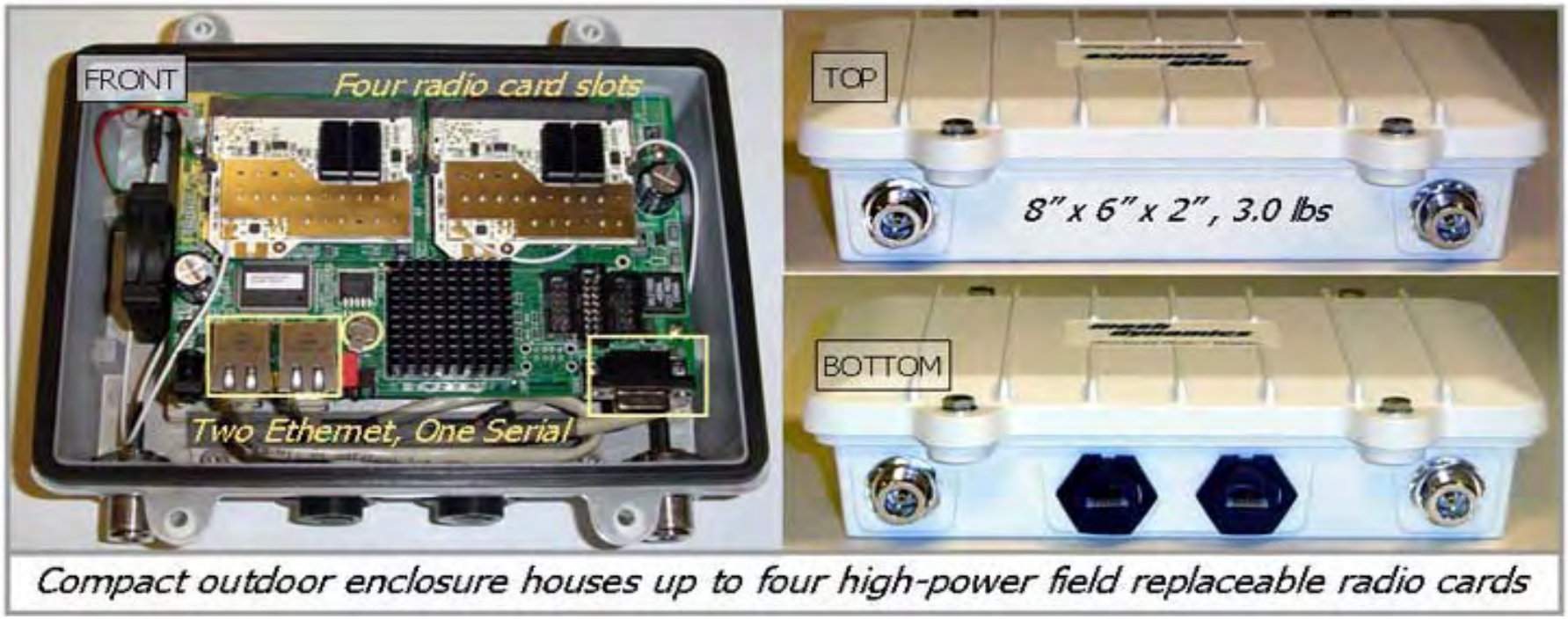
UP TO FOUR RADIOS FIT INSIDE EACH MESH NODE

MESH NODES CAN BE OUTFITTED WITH UP TO *FOUR* RADIO CARDS. EACH RADIO CARD CAN BE CONFIGURED TO ITS OWN FUNCTIONALITY AND SUPPORTED FREQUENCY:

- UPLINK RADIO*
- DOWNLINK RADIOS
- AP RADIOS
- SCANNER*

- **5GHz** (802.11a)
- **2.4GHz** (802.11b/g)
- **4.9GHz** (Public Safety band)
- Custom Channels



Compact outdoor enclosure houses up to four high-power field replaceable radio cards

(*MESH NODES CAN HAVE ONLY ONE UPLINK RADIO AND ONE SCANNER RADIO)

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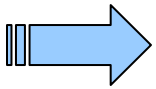

BACKHAUL-ONLY MESH NODES

MESH NODES WITH 2.4GHz SERVICE RADIOS

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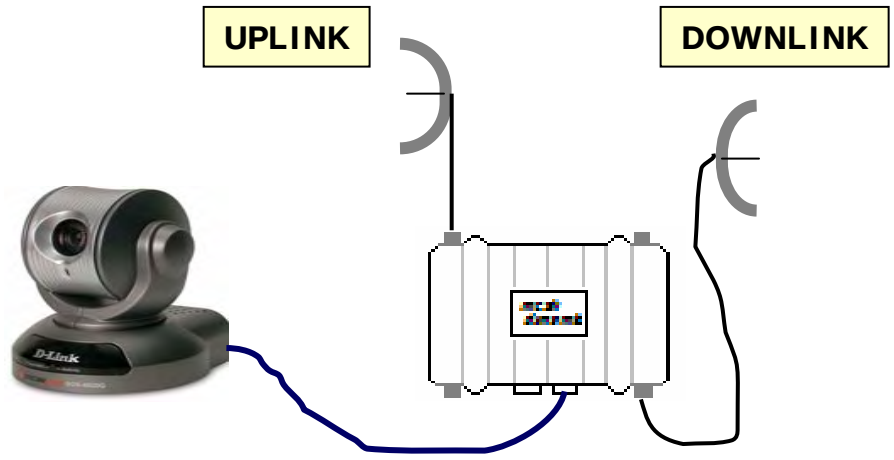
TWO-RADIO, 3RD GENERATION MESH NODES

THE **MD4250-AAxx** WILL "CARRY" A BACKHAUL WHEN 2.4GHz SERVICE IS NOT NEEDED. THE MOST COMMON USE OF THIS CONFIGURATION OF THE MD4000 IS SURVEILLANCE APPLICATIONS.



MD4250-AAxx WITH DIRECTIONAL ANTENNAS AND WIRED IP CAMERA

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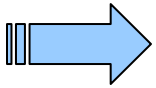

MESH NODES WITH 2.4GHz SERVICE RADIOS

RELAY MESH NODES WITH MULTIPLE DOWNLINK RADIOS

ROOT MESH NODES WITH MULTIPLE DOWNLINK RADIOS

MOBILE MESH NODES

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THE STANDARD MD4000

THE **MD4350-AAIx** IS OUR STANDARD THREE-RADIO MESH NODE; TWO BACKHAUL RADIOS, AND ONE AP RADIO.

AGAIN, SINCE THE **MD4000** USES MULTIPLE RADIOS FOR THE FUNCTIONS OF A MESH NETWORK, THIS ALLOWS THE USE OF SPECIFIC ANTENNAS FOR EACH RADIO'S FUNCTION.

IN THE PHOTO TO THE RIGHT, IT CAN BE SEEN THAT EACH BACKHAUL RADIO IS AIMED AT DIFFERENT POINTS ON THE HORIZON, AND THE AP RADIO IS ANGLED DOWN TOWARDS CLIENTS ON THE GROUND.

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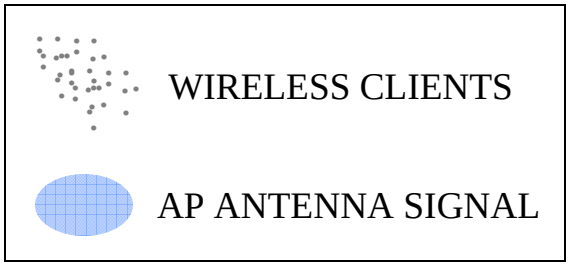
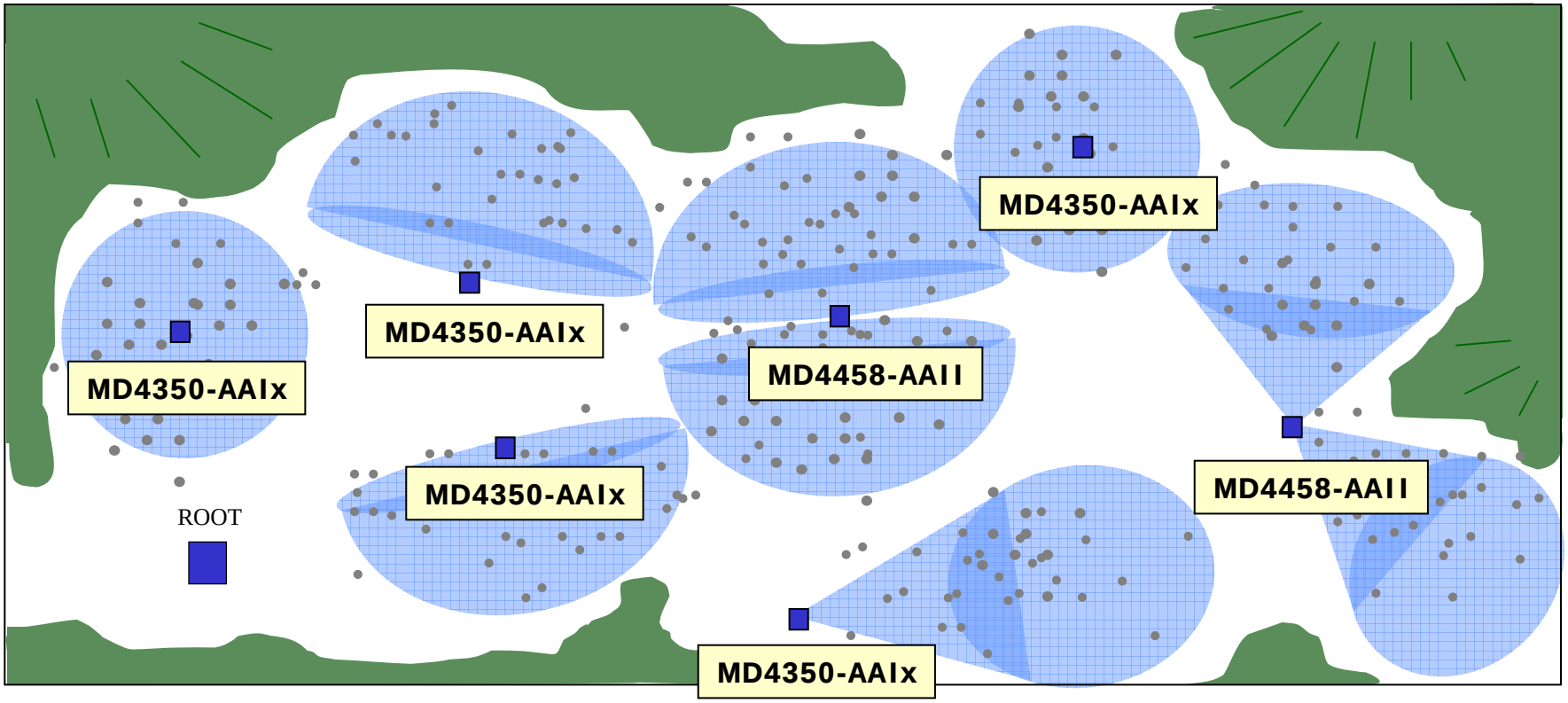
MULTIPLE AP RADIOS ON THE MD4000 CAN PROVIDE OPTIMAL COVERAGE AREAS

THE **MD4350-AAIx** AND **MD4458-AAII** OFFER ONE AND TWO *AP* RADIOS, RESPECTIVELY. ANTENNAS CAN BE SELECTED FOR THESE RADIOS TO OPTIMIZE *CLIENT COVERAGE* RELATIVE TO THE LOCATION OF THE NODE.





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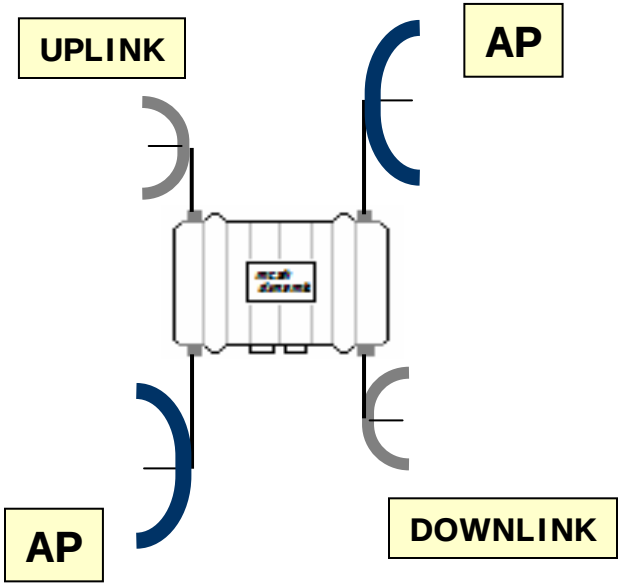
MULTIPLE AP RADIOS ON THE MD4000 CAN PROVIDE OPTIMAL COVERAGE AREAS (MINING)

THE DUAL AP RADIOS OF THE **MD4458-AAII** ARE USED IN UNDERGROUND MINES TO “SHOOT” THE SERVICE SIGNAL DOWN MINE TUNNELS USING HIGHLY DIRECTIONAL ANTENNAS. HAVING *TWO* AP RADIOS ON THE MESH NODE NOT ONLY GIVES DOUBLE THE TRANSMIT POWER, BUT IT ALLOWS THE SIGNALS TO BE SHOT IN DIFFERENT ANGULAR DIRECTIONS.



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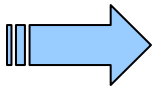

***RELAY* MESH NODES WITH MULTIPLE DOWNLINK RADIOS**

ROOT MESH NODES WITH MULTIPLE DOWNLINK RADIOS

MOBILE MESH NODES

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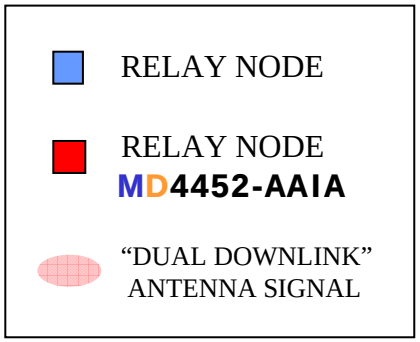
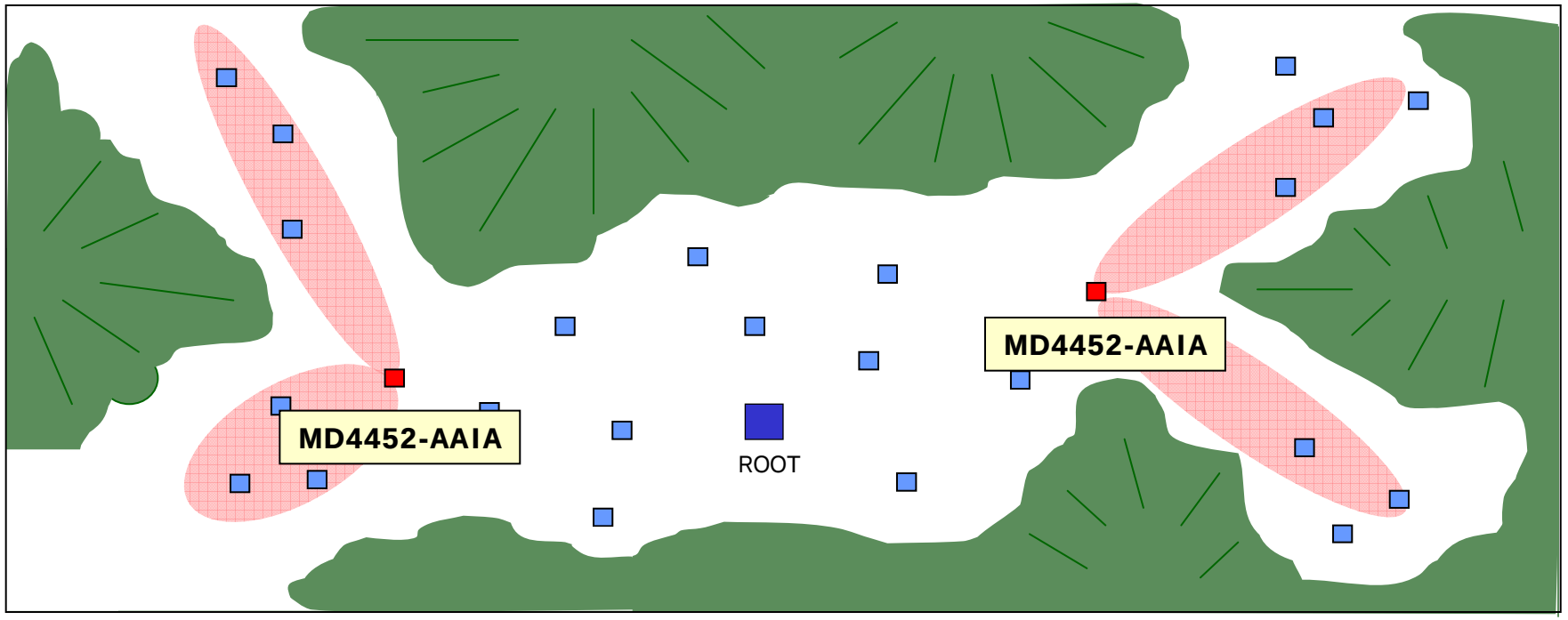
MULTIPLE DOWNLINK RADIOS ON RELAY NODES CAN PROVIDE STRENGTH TO BACKHAUL STRUCTURE

THE BACKHAUL *STRUCTURE* OF A MESH CAN BENEFIT FROM A RELAY NODE HAVING MULTIPLE DOWNLINK RADIOS. A NODE WITH A SECOND DOWNLINK ANTENNA ALLOWS A "BRANCHING" OF THE BACKHAUL; DIRECTIONAL ANTENNAS CAN BE USED TO *AIM* THE BACKHAUL SIGNAL TO DIFFERENT CLUSTERS OF CHILD NODES. THE **MD4452-AAIA** HAS AN ADDITIONAL DOWNLINK RADIO. IN THE ILLUSTRATION BELOW, IT CAN BE SEEN HOW THE USE OF MULTIPLE DOWNLINKS WITH APPROPRIATE ANTENNAS CAN HELP STRENGTHEN THE STRUCTURE OF A MESH.





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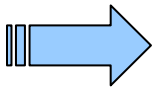

***ROOT* MESH NODES WITH MULTIPLE DOWNLINK RADIOS**

MOBILE MESH NODES

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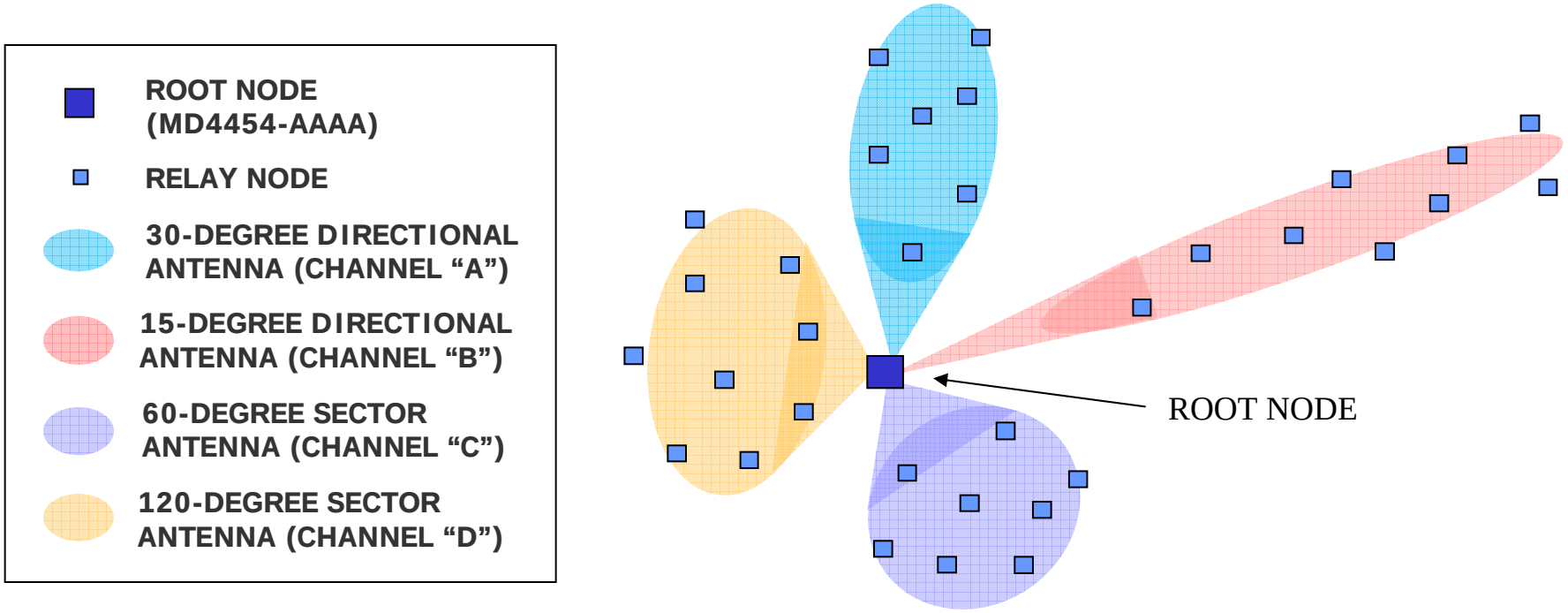
MULTIPLE DOWNLINK RADIOS ON ROOT NODES WILL SUPPLY A MESH WITH MORE BANDWIDTH

THE DOWNLINK RADIO ON A ROOT NODE WILL SUPPLY A MESH WITH 22Mbps OF TCP/IP THROUGHPUT ***TO*** OR ***FROM*** A WIRED NETWORK. SINCE ALL NODES ASSOCIATED TO THIS DOWNLINK MUST BE ON THE SAME CHANNEL, THE BANDWIDTH IS THEREFORE SHARED AMONGST THEM.

GIVING A ROOT NODE *MULTIPLE DOWNLINK RADIOS* ALLOWS MULTIPLE CHANNELS TO BE USED. EACH NEW CHANNEL PROVIDED WILL SUPPLY THE MESH WITH AN *ADDITIONAL* 22Mbps OF TCP/IP THROUGHPUT. SINCE THERE ARE *FOUR* AVAILABLE RADIOS ON THE **MD4000**, THIS IMPLIES A TOTAL THROUGHPUT OF 88Mbps INTO OR OUT OF A MESH.



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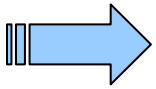

MOBILE MESH NODES

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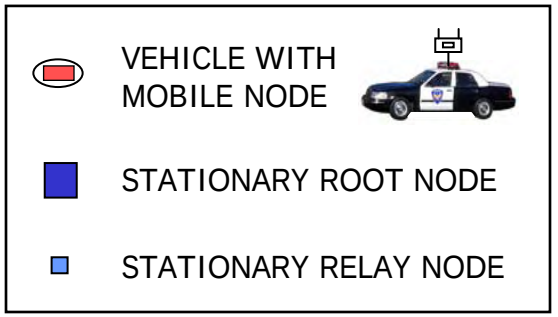
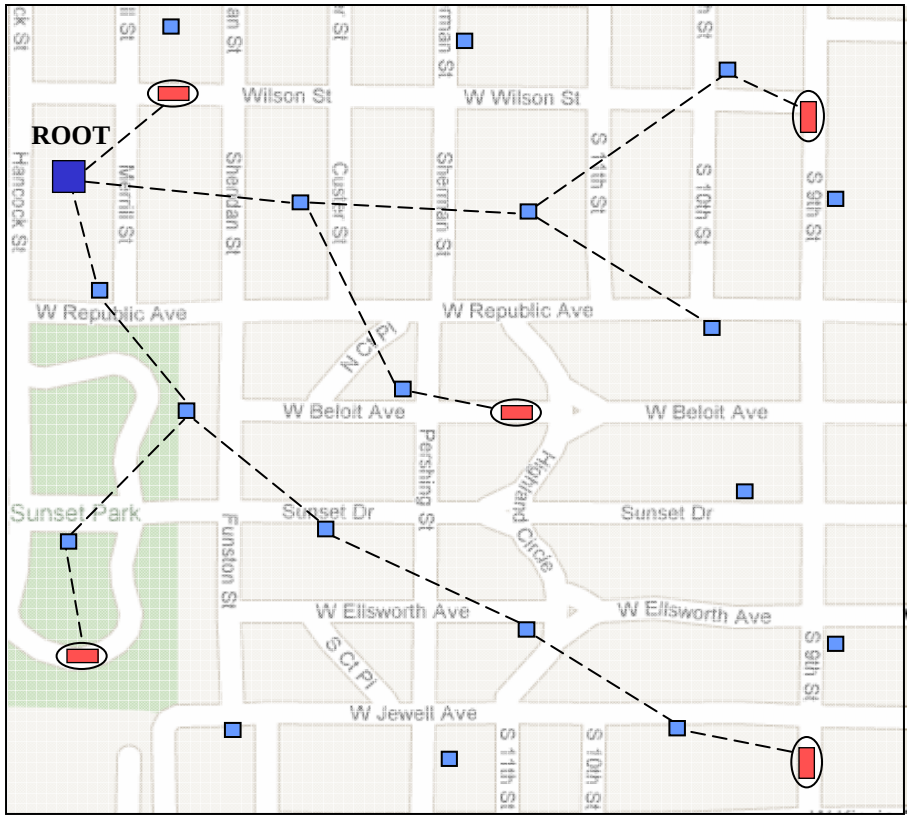
MOBILE MESH NODES (VEHICLES)

MESHDYNAMICS MOBILE NODES HAVE A RANGE OF APPLICATIONS. THE MOBILITY FEATURE ALLOWS A STANDARD **MD4000** MESH NODE TO MAKE SEAMLESS ON-THE-FLY SWITCHES FROM PARENT NODE TO PARENT NODE. SINCE THERE ARE A VARIETY OF **MD4000** MESH NODES, THERE ARE A VARIETY OF WAYS THE MOBILE VERSIONS CAN BE APPLIED. A COMMON USE IS HAVING THE MOBILE NODES MOUNTED INSIDE VEHICLES WHILE THE VEHICLES ARE MOVING THROUGH A STATIONARY MESH.



(TRUNK-MOUNTED MOBILE NODE)



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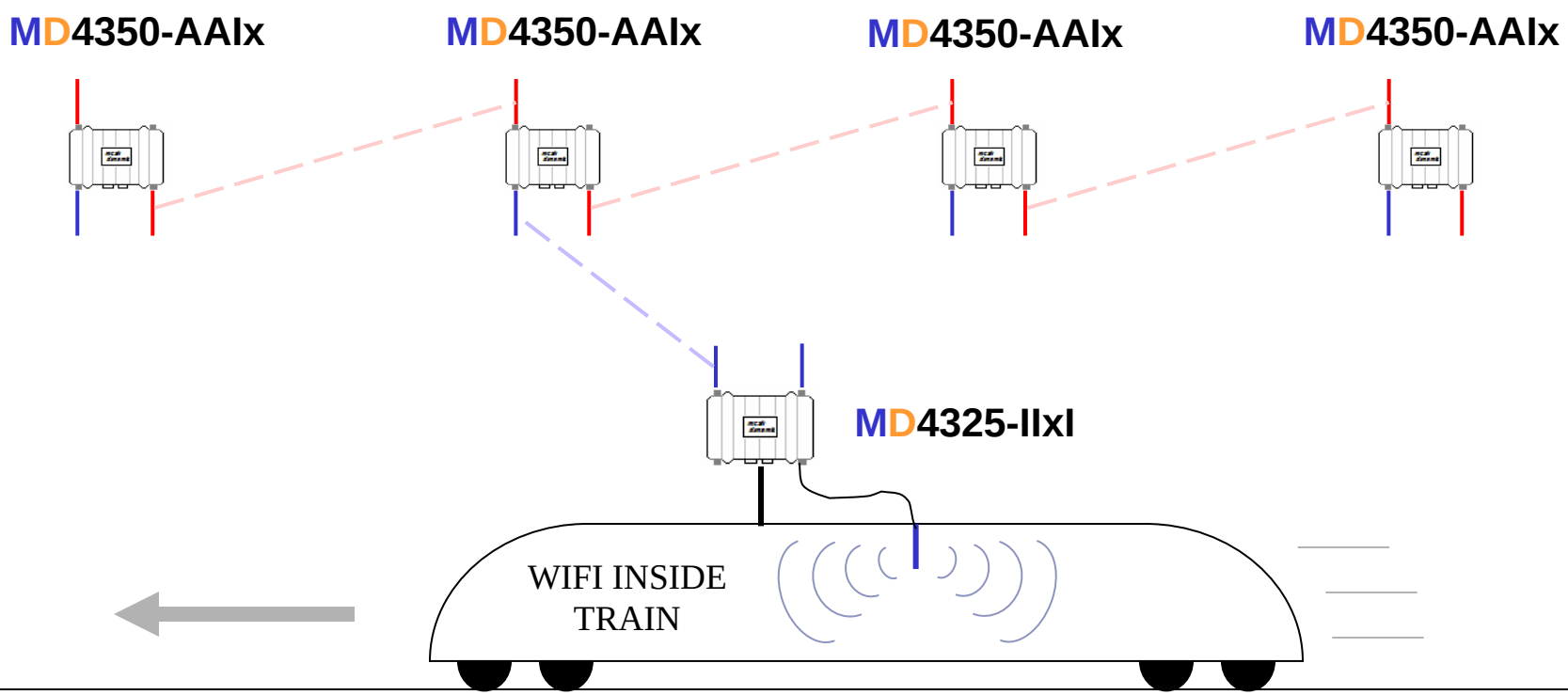
MOBILE MESH NODES (TRAINS)

RAIL APPLICATIONS ARE IDEAL FOR THE MOBILE VERSIONS OF THE **MD4000**. MOUNTING A MOBILE NODE TO TRAIN CAR WILL ALLOW THE TRAIN SEEMLESSLY SWITCH BETWEEN STATIONARY NODES ALONG THE TRACK WHILE GIVING UNINTERUPTED BANDWIDTH TO PASSENGERS OR SYSTEMS INSIDE THE TRAIN.



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MOBILE MESH NODES (ADHOC / MILITARY)

MESHDYNAMICS ***PERSISTENT 3RD GENERATION MESH*** (P3M) TECHNOLOGY ENABLES A SET OF MESH NODES TO FUNCTION WITHOUT THE PRESENSE OF A ROOT NODE. CLIENTS WITHIN THE P3M MESH WILL BE ABLE TO COMMUNICATE WITH EACH OTHER.

IN ADDITION, A MESH OF P3M MOBILE NODES CAN SEPARATE INTO SMALLER, FULLY FUNCTIONING DYNAMIC MESHES, THEN COALESCE TO FORM A SINGLE LARGER MESH.

IN THE PRESENCE OF A "WIRED" MESH NETWORK WITH A *TRUE* ROOT NODE, A P3M MESH WILL GRAB ONTO THIS NETWORK, THEN BECOMING PART OF THE "WIRED" MESH.

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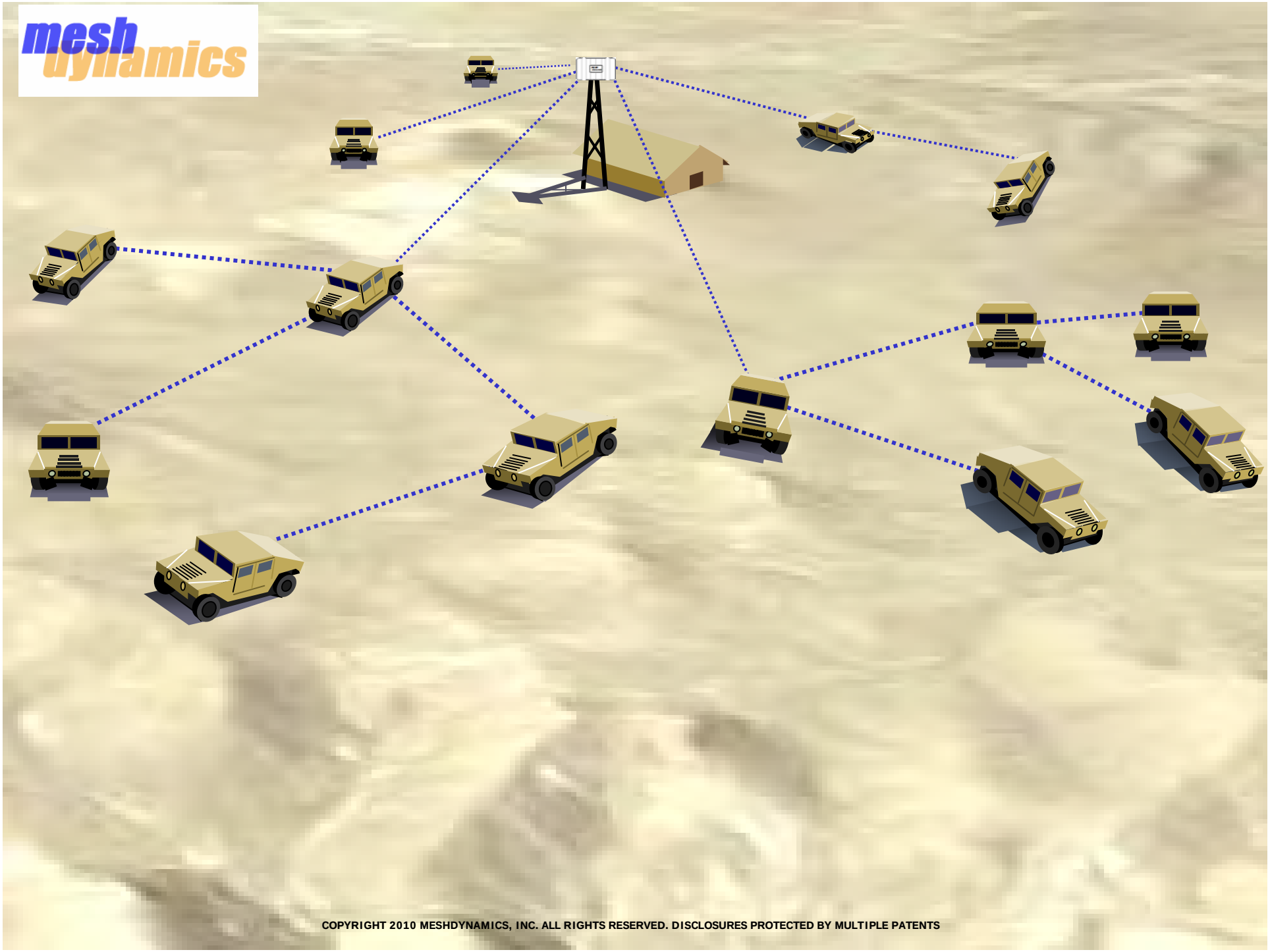

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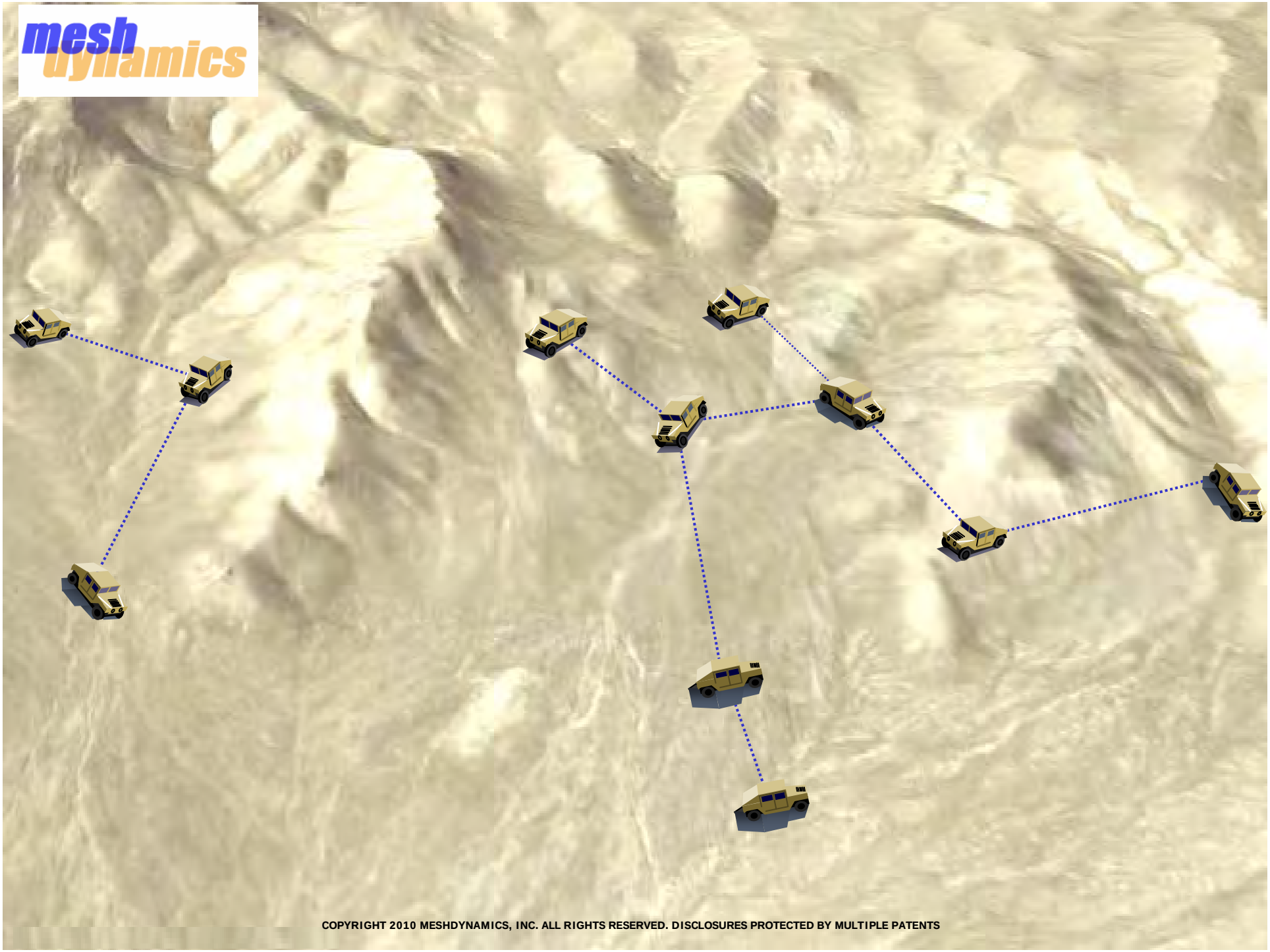

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