

Enabling Wireless Broadband Indoors and on Campus Through DAS and Small Cell Deployments

A stylized world map composed of a grid of small dots, rendered in a light blue color against a dark blue background. The map is centered and occupies the upper half of the slide.

Wireless Outlook 2013 and beyond

Tracy Ford
Director
The DAS Forum

Wireless Drivers

- Wireless connectivity is preferred method of communication
- 70% of calls, data connections take place inside buildings
- Wireless moving beyond “best attempt” to expectation, evidenced by FCC/carrier commitment on Text to 911
- Emergence of the Internet of Things



DAS Business Models

Rod Perry

Region Manager – DAS

Crown Castle International



Cellular Network Today

- Four bands
- LTE – more power and MIMO
- LEED buildings
- Problem: as demand for DAS has risen, so has the cost of deploying DAS

Cellular Operator Funded

- Carrier target has been high traffic, public venues
 - Airports
 - Sports Arenas
 - Shopping Malls
- The cost of upgrading networks to LTE has drained the capital budgets at the operators
- Carriers will still prefer macro sites or rooftop as their first solution to fix network issues

Landlord / End User Funded

- Organizations no longer have monogamous relationships with operators
- Early adopters started putting DAS into their buildings ten years ago
- Increasing trend to treat cellular as the “Fourth Utility”
- Operators still need to provide the radio resources to connect, which is not inexpensive

Third Party / Tower Model

- Tower companies all have divisions now that deploy DAS – outdoor and indoor
- They typically target same properties as the operators (because those are the ones the operators will invest in)
- Upside is a neutral party deploys for all operators and the property owner does not need to deal with cellular operators. Shared DAS should be less money than standalone

Other Considerations

- Regardless of the model, you always need to coordinate with the operators
- There are many things that venue owners can do to lower the cost (and barriers to entry) for the cellular operators
- Nothing happens fast. Need to plan years ahead of the need. Be patient, but persistent

DAS and Other Small Cells

Allen Dixon

National Channel Development Manager

Corning MobileAccess



What is a “small cell”?

- Imprecise term used to describe any RF source smaller than today’s base station
 - Femtocell, E-femto, picocell, microcell, remote radio head....
 - Used to match capacity to the desired coverage area at a lower cost

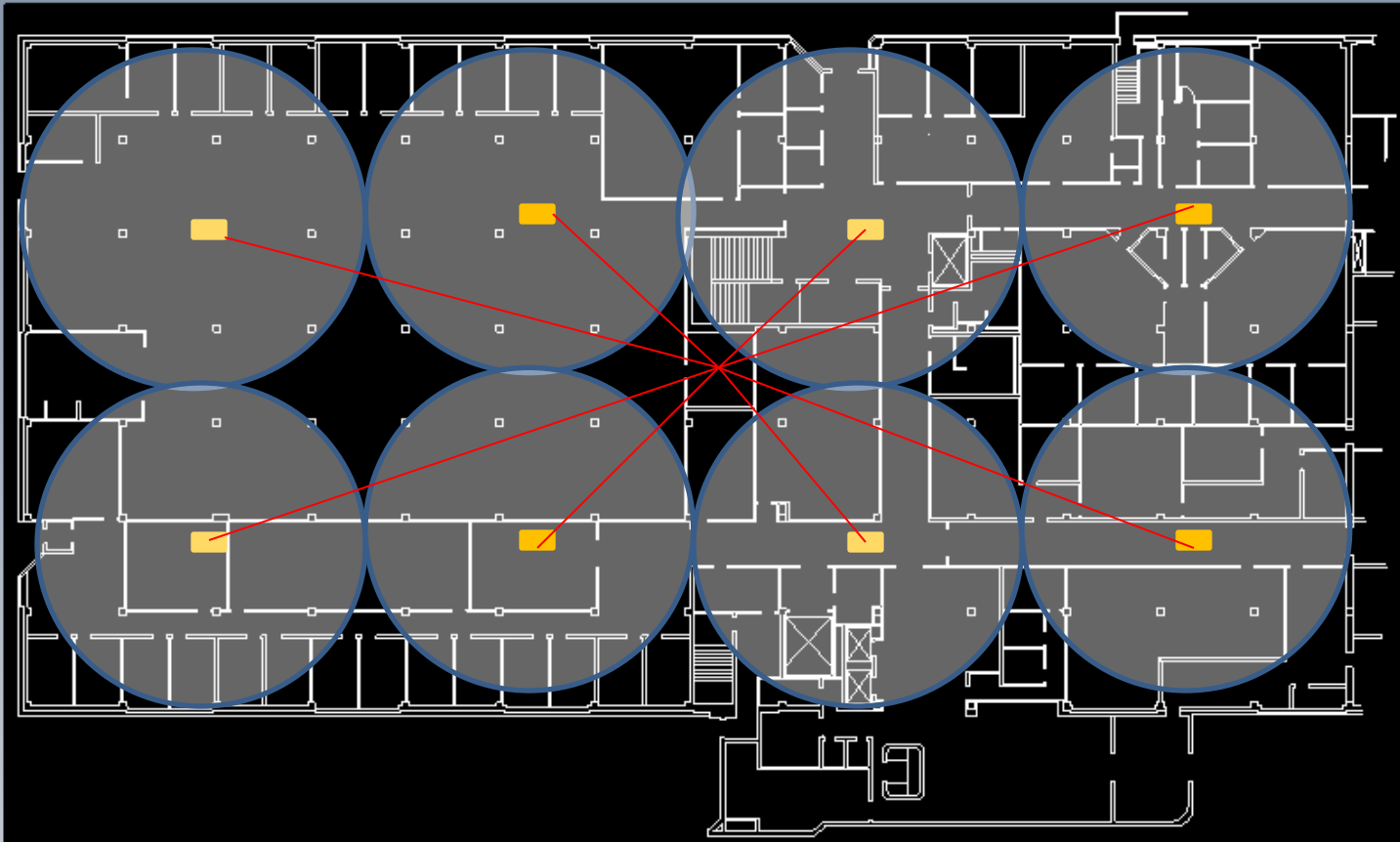
Small cells

Comparison

	Femto	E-femto	Picocell	Microcell	RRH
Range (ft)	40	100	500	10,000	
Users	4-6	20-30	30-100	200	
Cost	\$	\$\$	\$\$\$	\$\$\$	\$\$\$

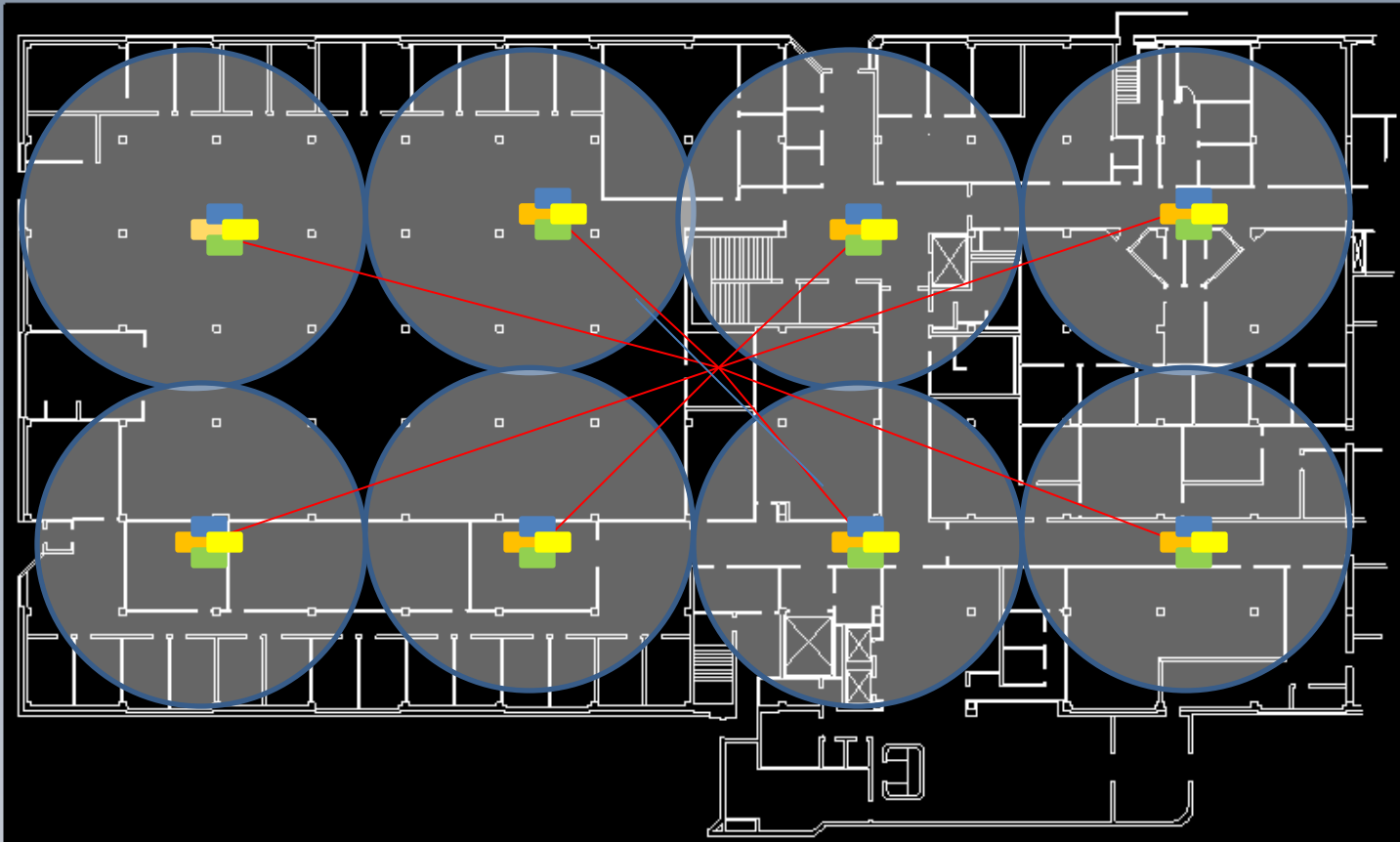
Small cell in-building coverage

Single provider



Small cell in-building coverage

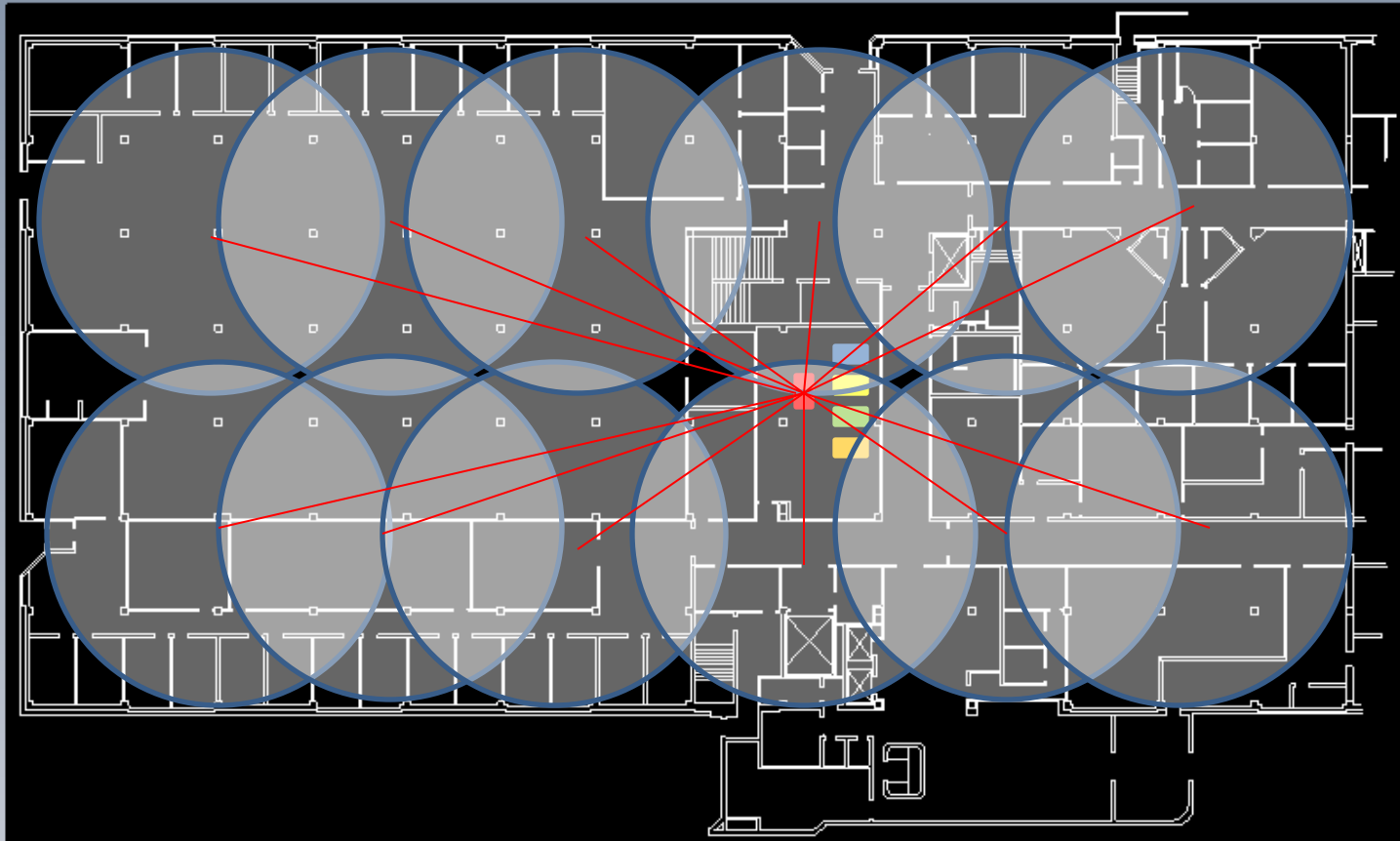
Multiple providers



What is a Distributed Antenna System?

- DAS Forum definition: A network of spatially separated antenna nodes connected to a common source via transport medium that provides wireless service within a geographic area or structure.

DAS in-building coverage



Small cell and DAS

Summary

- What do they do?
 - Reduce cost
 - Improve coverage
 - Improve capacity
- Small cells are just entering the market...
 - Technology is still developing
 - Single band, single technology (3G, 4G)
 - Can be effective for smaller spaces, less complex deployments
- DAS more effective in complex, large deployments
- Take away:
 - Anything that reduces cost of coverage is good
 - Any RF source can be used to drive a DAS

Small cell and DAS

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The SI Perspective

WHERE THE RUBBER MEETS THE ROAD

Bob Butchko

RF Connect



7 common project mistakes

1. Starting too late

- a) Do we really need to do this?
- b) PSRS Mandatory .. Cell coverage, maybe???
- c) Indecision costs money

2. Poor initial assessments

- a) Weak methodology
- b) Devoid of real analytics
- c) May times based on anecdotal evidence

3. Lack of qualified RF Engineering expertise

- a) RF is a bit like HERDING CATS
- b) It is just plain different!!!

7 common project mistakes

4. Not using a reference design in bid process

a) Produces what is called “EXTREME BIDDING”

5. Underestimating carrier coordination effort

a) You mean we have to get permission?

6. Not allowing for sufficient space and power

a) We never planned on a dedicated room that size!!

7. Poor coordination with other trades

a) Change orders abound

Thank You

Questions

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