CASE STUDY: physical installation of an arena Wi-Fi system

Rob Snively, RCDD, RTPM – IT Project Manager 2 - University of Florida
Topics for this presentation

Agenda

- About UF
- O’Dome History
- O’Dome Renovation
- Wi-Fi Plan
- Installation problems
- Does it work?
About the University of Florida:

<table>
<thead>
<tr>
<th>Main Campus: Gainesville, FL</th>
<th>Established: 1853</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Campus Size: 2,000+ Acres</td>
<td>US News Ranking: 8th in Public Universities</td>
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</table>
### About the University of Florida:

<table>
<thead>
<tr>
<th>Enrollment:</th>
<th>&gt;55,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty/Staff:</td>
<td>&gt;31,000</td>
</tr>
<tr>
<td>Campus Size:</td>
<td>2,000+ Acres</td>
</tr>
<tr>
<td>Mascot:</td>
<td>GATORS!</td>
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Photo credit: Allison McGee
Stephen C. O’Connell Center (aka The O’Dome) ... before the dust

<table>
<thead>
<tr>
<th><strong>Year Built:</strong></th>
<th>1980</th>
</tr>
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<tbody>
<tr>
<td><strong>Arena Seating:</strong></td>
<td>11,548</td>
</tr>
<tr>
<td><strong>Wi-Fi:</strong></td>
<td>What is Wi-Fi?</td>
</tr>
<tr>
<td><strong>Roof:</strong></td>
<td>Air Pressure Inflated</td>
</tr>
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</table>
NOW Exactech Arena at the Stephen C. O’Connell Center

**Year Renovated:** 2016  
**Wi-Fi:** Yeah Baby!  
**Arena Seating:** 10,500  
**Renovation Cost:** $65 Million
Notable Improvements

Grand Main Entrance

Photos Copyright Stephen C. O'Connell Center at the University of Florida
Notable Improvements

Grand Main Entrance

Corridors with Concessions

Photos Copyright Stephen C. O’Connell Center at the University of Florida
Notable Improvements

Grand Main Entrance
Corridors with Concessions
Club Seating and Lounges

Photos Copyright Stephen C. O’Connell Center at the University of Florida
Notable Improvements

- Grand Main Entrance
- Corridors with Concessions
- Club Seating and Lounges
- Center Hung Scoreboard
- Permanent 2nd Level Seats

Photos Copyright Stephen C. O'Connell Center at the University of Florida
Notable Improvements

- Grand Main Entrance
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And of course...

WI-FI
Notable Improvements

Grand Main Entrance
Corridors with Concessions
Club Seating and Lounges
Center Hung Scoreboard
Permanent 2nd Level Seats

And of course...

WI-FI everywhere!
So, how did we get there?
Access Point Installation Plan

What are we working with?

- Ceiling is too high.
- Ceiling weight limit will be max’d with new scoreboard.
- Few mounting options.
- Can’t obstruct fan view or cause a trip hazard.
- 100 meter Ethernet limit.
- >12,000 client devices possible.
Access Point Installation Plan

In an ideal world...

With the assistance of the UF IT wireless engineer, we submitted these locations to the architects and engineers to incorporate into the plans.
Level 1 Antennas & Access Points

Access Points mounted to wall but antennas TBD.

Photo Credit Bob Concelmo, RCDD, Complete Network Solutions
Level 1 Antennas & Access Points

Access Points mounted to wall but antennas TBD.
Access Points mounted to wall and use directional antenna.

Level 1 Antennas & Access Points
Co-located antenna and access point mounted to back wall.
Co-located antenna and access point mounted to back wall.
Co-located antenna and access point mounted to back wall.

What could go wrong?
Later in this presentation.
Handrail installed antennas and access points mounted below deck.

Photo Credit John Madey, RCDD
Level 2 Antennas & Access Points

Handrail installed antennas and access points mounted below deck.

Photo Credit John Madey, RCDD
Level 2 Antennas & Access Points

Handrail installed antennas and access points mounted below deck.

Photo Credit John Madey, RCDD

Excerpt from T3.03 100% Construction Documents
Handrail installed antennas and access points mounted below deck.

Photo Credit John Madey, RCDD
Level 2 Antennas & Access Points

From Above…

Antenna

…and below!

WAP

Photo Credit John Madey, RCDD

Photo Credit Rob Snively, RCDD, RTPM
Level 2 Antennas & Access Points

Handrail installed antennas and access points mounted below deck.

Photo Credit John Madey, RCDD

Photo Credit Rob Snively, RCDD, RTPM

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Handrail installed antennas and access points mounted below deck.

Excerpt from T3.03 100% Construction Documents

1” Hole in handrail

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Handrail installed antennas and access points mounted below deck.

Photo Credit John Madey, RCDD
Level 2 Antennas & Access Points

Handrail installed antennas and access points mounted below deck.

What could go wrong?
Next!

Photo Credit John Madey, RCDD

Photo Credit Rob Snively, RCDD, RTPM
If you’ve got a problem...

These guys can solve it! L-R: Rob Snively, RCDD, RTPM, UFIT; Chris Clark, RCDD, CNS Inc; Jon Lowell, RTPM, OSP, CNS Inc

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What could go wrong?

Handrail installed antennas and access points mounted below deck.

Photo Credit John Madey, RCDD

Photo Credits Rob Snively, RCDD, RTPM and Bob Concilmo, RCDD

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Handrail installed antennas and access points mounted below deck.

A guardrail is not a handrail!

What could go wrong?
Handrail installed antennas and access points mounted below deck.

A guardrail is not a handrail!
What could go wrong?

Co-located antenna and access point mounted to back wall.

Gonna need friends in high places.
What could go wrong?

Co-located antenna and access point mounted to **back-wall**.

Gonna need friends in high places.
What could go wrong?

Antenna and access point now mounted to upper ring.

You can’t get there from here.

~256 Feet
~78m

Added Telecom Rooms

~256 Feet
~78m
Final antenna placement showing antenna signal orientation

<table>
<thead>
<tr>
<th></th>
<th>Upper Ring Access Points: 40</th>
<th>Access Points Behind Retractable Seats: 24</th>
</tr>
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<tbody>
<tr>
<td>Hand Rail Access Points</td>
<td>75</td>
<td>Access Points in Rest of O’Dome: 75</td>
</tr>
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</table>
Turn it over to the network engineers
Turn it over to the network engineers

Survey Data provided by Tom Chesterfield, UF IT
Finally, the Cost

<table>
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<tr>
<th>Total O’Dome Network Install. Cost: &gt;$1 Million</th>
<th>Arena WiFi Wire and Labor: &gt;$75,000</th>
</tr>
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<tbody>
<tr>
<td>Total Arena WiFi Cost: ~$300,000</td>
<td>BICSI Certified Experts: Priceless</td>
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The End...Questions?