

TAB Meeting, November 16, 2011

Present: Jerry Riehl, Louis Davis, Mark Alexander, Greg Billings, Tim Boruff, Chris Cimino, Joanne Logan, Sally McMillan, David Ratledge, Joel Reeves

Guest: Craig Canevit, Bill Dunne, Philippe Hanset, RJ Hinde, John McNair

Wireless in Residence Halls – Philippe Hanset, Craig Canevit

- Main campus upgraded 2009, new access points, latest standards – one-to-one exchange, last two years adding where see need and proactively look for places where wireless would be needed
- In 2007 iPhones etc. not so widespread, not so many laptops. Wireless as complement to Ethernet. Now people expect wireless, so existing wireless no longer sufficient.

Dorm	Floors	Capacity	Rooms	# of SER	Current # of APs	Proposed # of APs	Current #student/AP	Move-in Complaints	Proposed #student/AP
Andy Holt	15	907	320	8	80	162	11.34	5	5.60
Morrill	15	754	395	4	37	89	20.38	7	8.47
Carrick Hall	13	1068	551	8	90	169	11.87	2	6.32
Laurel Apts	14	646	330	7	107	147	6.04	0	4.39
Volunteer Hall	12	709	180	6	118	118	6.01	0	6.01
Clement	9	698	370	3	33	71	21.15	7	9.83
Reese	8	521	282	7	28	79	18.61	3	6.59
Humes	8	524	284	7	26	75	20.15	4	6.99
Hess	9	1008	555	8	43	197	23.44	8	5.12
Massey	8	581	306	5	33	76	17.61	4	7.64
Gibbs	6	215	119	3	21	42	10.24	1	5.12
TOTAL		7631	3692	66	616	1225		41	

- Humes, Reese, and Carrick really bad for wireless. Problem is design – locating access points in hallways, less expensive to install, easier to access. But those dorms have suites, so number of walls between the AP and the user increases, including “wet walls” (with plumbing).
- Using two frequencies on several versions (802.11b-g, 802.11a, 802.11n). 5 GHz doesn’t reach the room; 2.4 GHz reaches the rooms. BUT 2.4 GHz is overcrowded.
- Humes, Reese, and Carrick need different design. Wireless AP needs to be in the room.
- Conversations with other schools; they are moving away from hallway APs.
 - When dorms were built 40-50 years ago, weren’t designed for wireless.
 - APs in hallways see each other, use Adaptive Radio Management to tune themselves, and reduce the size of the cell to keep from interfering with each other. Locating APs in bedrooms isolates them from each other, which is good. One AP should be able to feed six people. Blinking lights can be turned off.
- May be able to “steal” existing bedroom ports to serve as APs, rather than needing new wiring.
- Did a lot of work in Carrick this past year – more APs, stronger APs, didn’t help much. In 2007, located APs on every other floor; the signal travels well between floors but not well along floors. Added circuits, put APs on every floor, using 2.4 GHz APs. Now better, but still getting some complaints. Located the complaints, mapped to rooms, found some corners that needed to be filled in.
- Coverage is excellent but can’t sustain demand for capacity.
- Question from **Logan**: Are students using wireless with their phones, or using their data plans? Answer from **Hanset**: Have 75,000 devices registered; 16-19% are iPhones. Comment from **Billings**: Carriers moving away from unlimited data plans. Comment from **Ratledge**: WiFi is faster than 3G. Comment from **Hanset**: But WiFi drains the battery.
- Overview
 - Switches are 9 years old, no longer supported
 - Current wireless is complement to wired
 - 10% of ports used initially; increase to 40% as students realize issues with wireless

- Rewiring switches AND adding more wireless has issues: SER heat, electric load, cost. POE switch uses 4x amps as standard switch. Some SERs exceed 120degF.
- Question from McNair: Are you talking 100GB ports? Hanset: Combined capacity of 5GHz and 2.4GHz is only 250Mbits/second.
- Alexander: Why pulling power through Ethernet, rather than standard power? Hanset: People disconnect them, extra cost, internet jacks are not near power outlets. Also can't use UPSes that way, to keep wireless up during power outages.
- Proposed solution
 - Provide high-end wireless w/8 users per AP.
 - Locate APs in bedrooms.
 - Disable wire and only enable on request. Some rooms have no option for wire.
 - Wireless w/GigE: \$1.5 million + Wire (\$1 extra Million for equipment, not SER alterations) – will need to recombine pairs on the cables to do this, or increase budget and pull more wire.
 - Or, keep existing switches, remove ¾ of existing switches, don't use wired, buy power injectors (much cheaper than switches), keep pulled switches as replacements.
- Proposed next steps
 - Measure wired port usage per dorm – biased due to lack of wireless. Comment from **Alexander**: Map wireless usage. Comment from **Hanset**: Hard to do that; gamers prefer wired. Looking at Laurel as a good example of wireless close to what we want. Comment from **McMillan**: Laurel not a good place to test for gamers. Question from **Cimino**: Does wall construction matter? Answer from **Hanset**: Yes, cinder block is a nightmare. Vol Hall has modern construction, fewer APs, still pretty good. Comment from **Cimino**: Long-term plans for dorm reconstruction require different solutions for different buildings. Question from **Riehl**: Can we get a copy of the master plan? Answer from **Cimino**: Will send it to you. Comment from **Hanset**: Andy Holt Apartments working with APs in halls.
 - Test solution in Reese – install over break, test in semester. Issue of taking wires away during break, but want to work with the students, will cope with the heating issue.
 - Implement selected solution by next fall. Would like it to last at least eight years.
 - Question from **Davis**: Does Ethernet over power lines work in the dorms? Answer from **Hanset**: Only in Mode A, power injectors. Powered switch, 48 ports, may only use 8-9 POE ports for wireless. Instead, buy non-powered switches and a mid-span. Sort of a hacked POE. Good compromise. In dorms, can provide POE with mid-span, which doesn't work on the large circuit. Question from **Davis**: No, asking about Ethernet over power lines, wall outlets. So if need current ports for wireless, could we run Ethernet over the power line? Answer from **Hanset**: No, tried that; capacity is only 10 Mbits/second.
 - Question from **Alexander**: Reese, test installation over winter break? Answer from **Hanset**: Yes. Presidential most problematic. Reese good test case because of gaming. Question from **Alexander**: Have you talked to anyone in Housing? Answer from **Hanset**: Not yet.
 - Question from **Reeves**: What cost just to do Reese? Answer from **Hanset**: Minimal, \$120,000. Question from **Reeves**: So that's the whole building? Answer from **Hanset**: Yes. Question from **Alexander**: How many wired ports active and in use in Reese? Answer from **Hanset**: Not exactly, but maximum is about 50%.

Update on HSS classroom renovation – Bill Dunne

- 11.5 years ago, first Facilities Fees being paid by students. About 1/3 of those funds would be put toward classroom renovation (to be determined). Good decision. That support has been invaluable.
- About 220 classrooms around campus that are “registrar hosted” or “nationalized.” Everything from Cox Auditorium, which can seat 900 students, to many 20-student rooms.
- Was a “nationalization event” about two years after Facilities Fee, and since then, departments have been handing over their classrooms in exchange for classroom upgrade process. Betsy Creekmore and Sally McMillan know exactly how many classrooms are not nationalized.
- 11.5 years ago, what were we doing? Mainly lecturing. But need to get technology into classrooms. Originally six levels of technology; now only one. User experience – want to make it easy for the faculty or TA. Went to a fairly standardized set of furniture, but some different options. Issue: student size, handedness; worked around by moving to chairs/desks rather than desk-chairs. Need to pack bodies into classrooms. Classrooms were rotated to add more seats. Lecturing was The Way.
- Went along for eight years, CETIS now Classroom Upgrade Subcommittee, some overlap with TAB.
- About three years ago, started thinking about other options than all lecture, all the time. If a lecture is truly a one-way information flow, does the listener need to come to campus to sit and listen? Look at different ways of doing things. Added ITES, OIT, Facilities Svcs, TennTLC to committee to bring in more knowledge bases. Working around ideas of “student engagement” and “student learning”.
- Barrier isn't the students, it's the faculty. Lecturing is a relatively “safe” thing to do – speaker controls the room, but student engaged learning some of the control rests with the students.

- Plan: There is a building, HSS. It's old. It's not good because it's old. HSS handles about 20% of teaching in registrar-hosted classroom. A lot of GenEd, a lot of Arts & Sciences. Some of those departments would like more flexible spaces. This summer will do a lot in HSS to create 35-40 more flexible classrooms. University recently did major HVAC upgrades to HSS, so that affected the CUS plans.
- HSS Diagrams (attached at end): Looking at converting one classroom to Aramark (and more outdoor furniture), set each of the classrooms to about the same number of students (35 for most, 40-45 for a few, 70 for one). Similarly, on second floor, create an informal space with printer stations and recharge stations, even out the classrooms.
- According to University, HSS has 2,207 seats; only about 1,536 actual. Proposing 1,615.
- New tool of choice to replace tablet armchairs: the NODE Chair, with wheels, place for backpack, pivot table. Wall-mounted board, lots of them. Projection system/s, similar to SmartBoard for more interactive presentations. "Lure teachers out from behind the podium."
- Videos and pictures. Have four classrooms in HSS and one in Henson with NODE chairs. They have been very well received. Would also allow for classroom management, by color coding per size of classroom; easier floor cleaning.
- If going to more small group, will also be more students using devices. Hanset had estimated one AP per 20 students. Looking at covering wireless upgrades out of existing funds.
- Overall, changing classrooms and hallways and outside of building. Hope people will stop thinking of HSS as "oh, geeze, I have a class there, ick." Allow more modes of teaching and more student engagement.
- Comment from **McMillan**: Idea of creating engaged classroom, students not only working on whiteboards and talking, but using technology. Under discussion: requiring all students to have a laptop. Have some benchmark data. If we know every student coming in has a laptop, most of them already do, but if it's required, Financial Aid can cover it. That changes a lot of things about teaching / technology. At that point do we need an OIT lab or is it more important to have a place with charging stations and print stations? Comment from **Riehl**: Robin McNeil gathering usage stats.
- Finally, looking at allocating funds for computers on campus, new model rather than OIT computer labs. This affects HSS in two ways:
 - There is already an OIT computer lab. As students have their own devices, could that lab be converted to a classroom?
 - Classroom Upgrade Subcommittee doesn't do computers, doesn't even put the computers on the podiums, because there's no one to take care of them. But some classrooms really need computers, e.g., a classroom in AMB used by math and chemistry for small group work; a writing classroom in HSS. Would like to ask TAB to consider funding these sorts of *instructional* computers.
- Comment from **Davis**: Difference between a course where every student is online every day, versus classes where the computers are only needed a few times during the semester. Would like to see some OIT maintained clients to cover quick needs, but not devote lots of money to computer labs. Comment from **Dunne**: These would be informal spaces, not schedulable classroom spaces; we'd have power and print stations. A must-have-laptop policy will probably take 4-5 years to affect teaching. The Writing Concentration classroom depends on the client software being synched to the instructor software. Comment from **Davis**: want to minimize classrooms with assigned computers. Comment from **Dunne**: We don't create these sorts of rooms unless they're booked 8-5, 5 days/week.
- Question from **Hanset**: About those chairs – how long does it take to reconfigure from chaos? Answer from **Dunne**: About as long as needed to occupy the chairs. Also, will have table on wheels designated for students who use wheelchairs. Inspired suggestion for the very plus-sized students (e.g., football linemen), will have a Murphy Bench and the table can move to that. Actually, looking to see if culture changes and people can lecture without students in rows.
- Comment from **McMillan**: Updated room in Communications building a few years ago with similar furniture. Question from faculty member was, "How do I keep [them] from cheating?" So many things wrong with that assumption. Next question was, "Who's responsible for putting it back in order?" Well, what is order? Comment from **McNair**: Any given configuration lasts for a while, some chairs are stacked in corners. When people bring laptops in, people wheel over near a power supply. Suggest tablets for longer life; HDMI connections to projectors. Comment from **Dunne**: Two local high schools (STEM, Webb) using tablets as part of the instruction. Dunne's daughter does all her math and physics on her iPad. Faculty time has limits; finding the time to adapt to new technology is an issue. We're probably on the edge of major change in next decade. Comment from **McMillan**: Look at faculty lectures 15 years ago, no one worried about Death by PowerPoint, but faculty realized it was easier to use PPT than overhead transparencies. TENNTLC and ITC really help with ways to teach. Believes will evolve quickly. Dunne: Caution against massive deployment against more electrical outlets across campus. Probably 3-6 years from now, not 10-15.
- Comment from **Dunne**: Furniture bought 11 years ago was basically indestructible. Wheels may be less so, and NODE chairs only a couple of year old so no long-term data.
- Would like to have computers in AMB classroom by January; asks for TAB action. May be limited other spaces where Tech Fee should support instructional computers.
- **Riehl**: Will work with Dunne on package to present to TAB. **Alexander**: What you're talking about is specialty department labs.

Humanities and Social Sciences: Number of seats in each classroom

Room	LISTED SEATS	Observed	Proposed
51	48	48	54
53A	30	35	35
53B	44	35	40
54	0	0	40
55	40	34	35
56	35	41	35
57	45	42	35
58	41	41	35
68	45	41	35
69	43	37	35
70	36	44	35
71A	25	25	0
101	40	38	35
102	25	25	40
103A	45	47	40
103B	50	42	40
104	47	46	42
105	40	40	35
106	35	32	35
107	35	35	35
108	45	36	35
109	35	35	35
110	35	36	35
111	50	48	40
112	40	31	32
113	60	54	60
114	52	35	35
115	40	46	42
118	40	35	35
119	40	34	35
120	40	36	0
203	94	91	75
204	51	48	40
205A	35	42	40
205	0	0	60
206	0	0	60
207	0	0	60
215	34	38	35
216/216A	0	0	0
217	50	49	35
218	60	48	40
219	42	36	35
220	41	30	35
	2,207	1,536	1,615



