Learning Spaces & Technology

The iBorrow Project Conference

Canterbury Christ Church University, 25 March 2010

Wireless Solution

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Project Scope

- Deliver a Wireless Service within Augustine House
- Provide Real Time Location Tracking of iBorrow self-loan notebooks
- Export Location Data about iBorrow clients

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Other Research?

- JANET(UK) Network Access - Investigations into Location Awareness 2007-2009
  - Overview of Location Technologies
  - Location Accuracy and Security
  - Evaluation of indoor location determination technologies

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Challenges

- Integration with Augustine House Project
- Providing a Wireless Service within a large open plan building
- Designing a flexible and scalable solution to meet the changing requirements of the building over time
- Existing Wireless Solution could not provide Location Tracking

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Technology Questions

- Wireless Standards? 802.11n Draft?
- Which Location Tracking Methods should be used?
- Tracking Granularity
- Autonomous or Lightweight Architecture
- How would this impact the existing service?

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Wireless Standards

- Existing Service 802.11a/b/g
- 802.11n not ratified until July 17, 2009
  (not published until October 29, 2009)
- Access Point costs for 802.11n considerably higher
- 802.11at (PoE+) not ratified until September 11, 2009

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Factors influencing choice of solution

- Knowledge Base and Existing Investment
- Wireless Collaboration
- Project Time Frames
- Need to deliver consistent Wireless Service across all sites
- Small implementation window

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Design Criteria

- Wireless Service must deliver Janet Roaming Service
- Capable of supporting multiple BSSIDs
- Deliver sufficient bandwidth for all clients
- Allow fast roaming between Access Points
- Deliver Location Tracking Capability

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Design Choices

- Only Lightweight Access Point Solutions provided the location tracking capability we needed
- 802.11a/b/g to avoid service disparity and unplanned investment elsewhere
- Edge Switching would only support 802.3af (additional argument for ruling out 802.11n)

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Wireless Solution

- Cisco Unified Wireless Network comprising:
  - 120 Lightweight Access Points
  - 4 WLAN Controllers
  - 1 Wireless Control System
  - 1 Mobility Services Engine
  - Professional Services

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Professional Service Considerations

- Not implemented Wireless in an open plan environment on this scale before
- Leverage Expertise and Resource capabilities
- Faster implementation
- Gave us assurance that we would deliver on time

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Additional Components

- 2 Microsoft IAS/NPS Servers providing PKI Certificate Based Authentication for iBorrow self-loan notebooks

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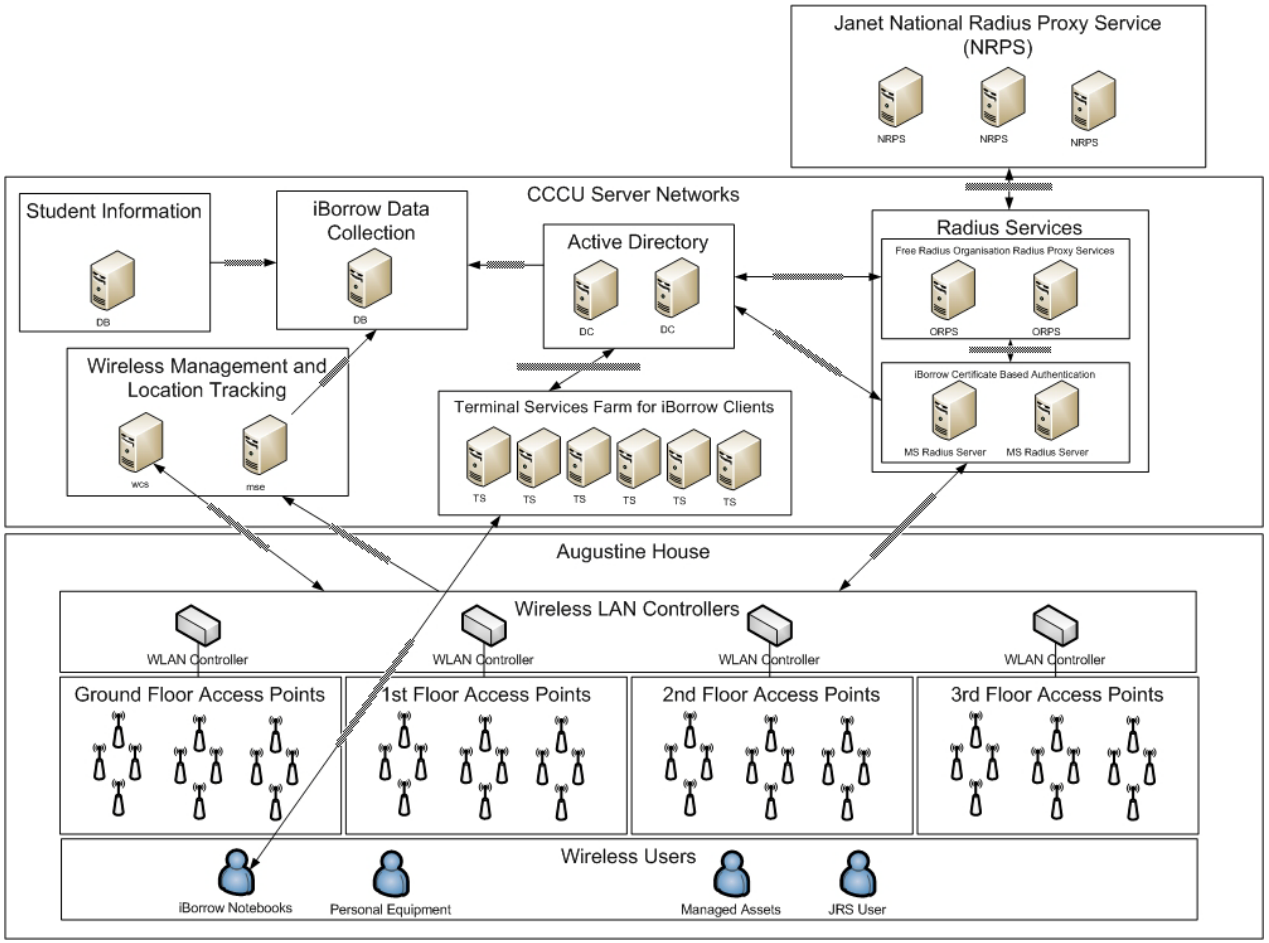
iBorrow Component Overview



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Developments

- WCS/MSE/WLAN Controllers pre-staged to allow assessment/testing of features
- Pilot scheme to develop location tracking solution in conjunction with Data Working Group
- PKI Certificate Based Authentication solution developed

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Implementation

- WLAN Controllers moved to site once Cabling and Network Infrastructure in place.
- RF Survey carried out to finalise Access Point locations
- Access Points Installed

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Implementation contd...

- Wireless System Calibration
- Location Zones defined
- Wireless Location Data Extraction starts
- Wireless Service goes live
- iBorrow Self-loan Laptop scheme goes live

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Issues

- Access Point numbers and positioning needed to be estimated for the construction project prior to selecting a solution for iBorrow
- Access Point Mounting options limited and problematic
- Additional Funding Required

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Issues Contd...

- Certificate Based Authentication required new approach to Radius Service Delivery
- Delays in Cabling Provision
- Wireless Calibration had problems

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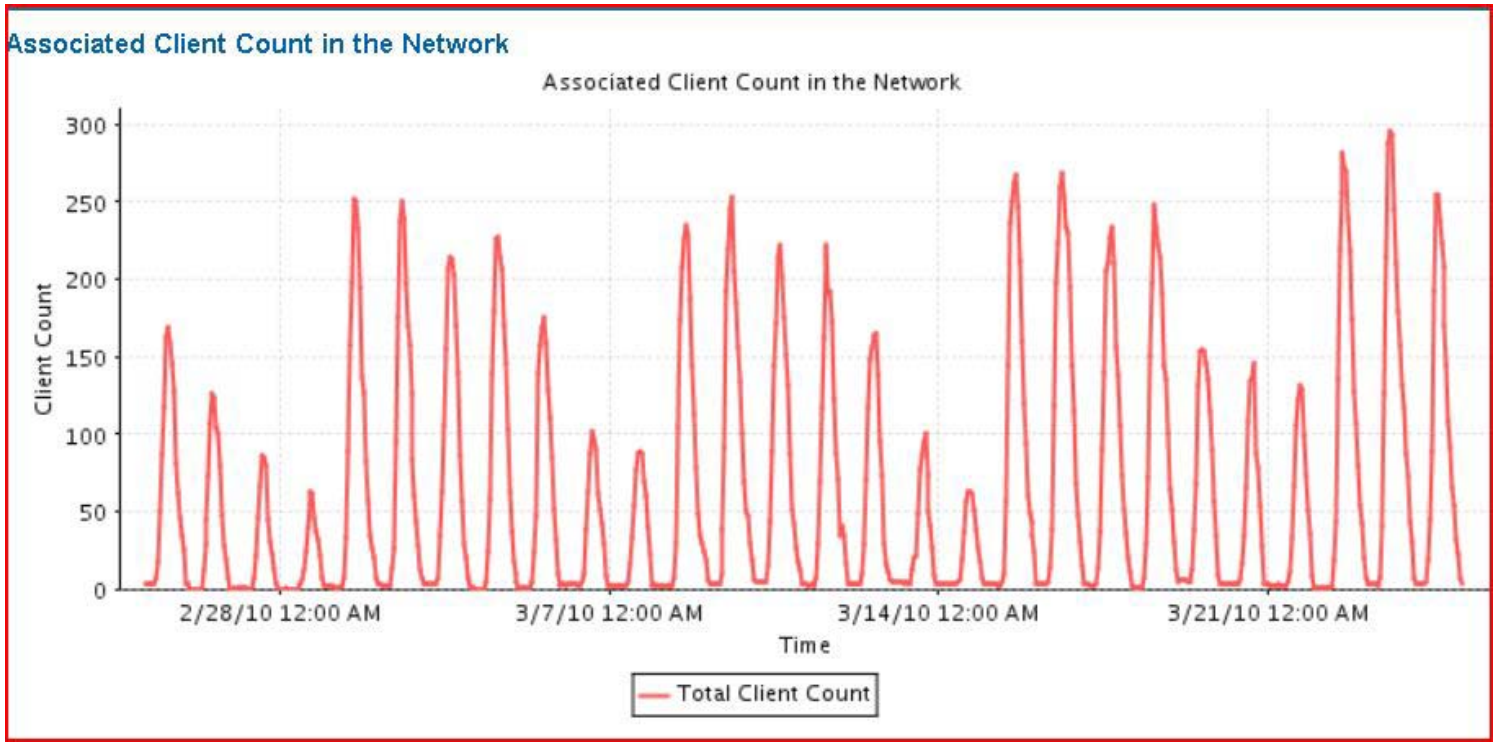
Outcome



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Positives

- Provided valuable information to Medway Consortium
- Opened the door to considering 802.11x in a wider context
- Have a migration plan for our existing Wireless Service investment
- Have a solution that can be scaled across the University if required

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A few stats... Last 4 weeks

- 1,360 Unique Users
- 52,000 Sessions
- 66 Roaming Users from other organisations
- 97% 802.11g
- 3% 802.11a
- 2902289.71MB total traffic

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Network Services

Chris French	Project Lead
Laura Gallagher	Network Infrastructure
Matthew Stears	Data Cabling
Paul Osbourne	Wireless Authentication Services
Ben Tanner	Back-end Server Infrastructure
Andy Wood	Wireless Deployment

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