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Educating Network Security Experts via Distance Learning

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Who are they



- Arosha
 - Chairs modules in 'network security'
 - Research on adaptive systems, security and privacy
- Andrew
 - Chairs modules in 'advanced networking'
 - Works with the Cisco Networking Academy Programme
 - Research on simulation in networking



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Some context



- The Open University
 - Faculty of Mathematics, Computing and Technology
 - Postgraduate Computing and Technology Programme
- Programme includes modules in:
 - Advanced Routing
 - Multi-layer switching
 - Optimising Networks
 - Network Security
 - Digital Forensics and Investigations
 - Information Systems Management
 - ... plus other Computing modules.



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The story



- The challenge of getting a practical network security discipline into the world of distance learning
- Understanding some of the demands of industry
- Offering post-graduate credit and professional development



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In our opinion



- What worked
- What could have been done better
- What is open for more development



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Skills, what at a university



- What is the benefit of pure theory?
- Research and reflection is very important
- But, ability is essential

- There are many combinations, we looked for something that would bridge the theory + skills divide



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Using Certification



- Out there, there is a demand for
 - CISSP
 - CCNA-Security
 - Security+
- Appreciating the starting points
- Knowing where the demands are
- Also knowing what is available (why CCNA-S not CCNP-S)



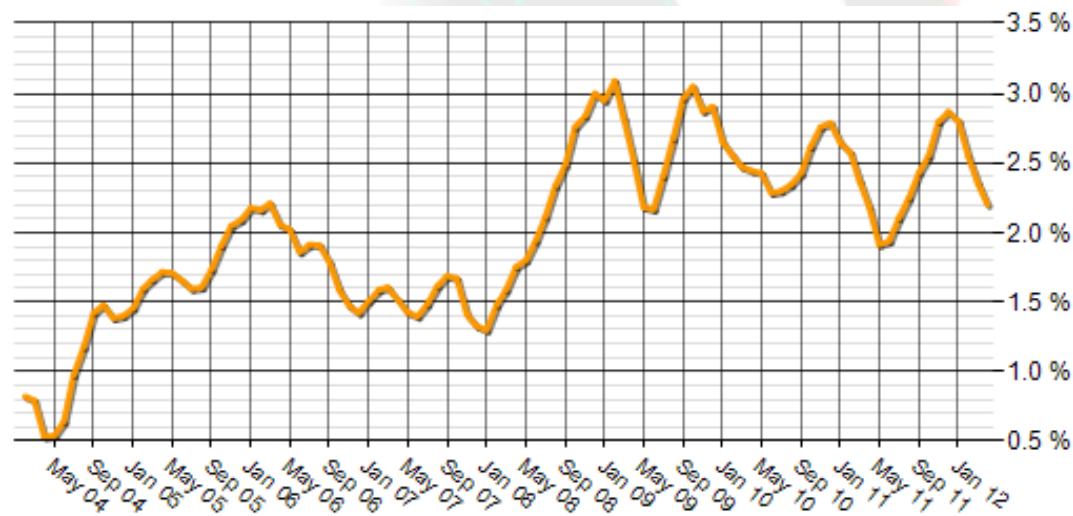
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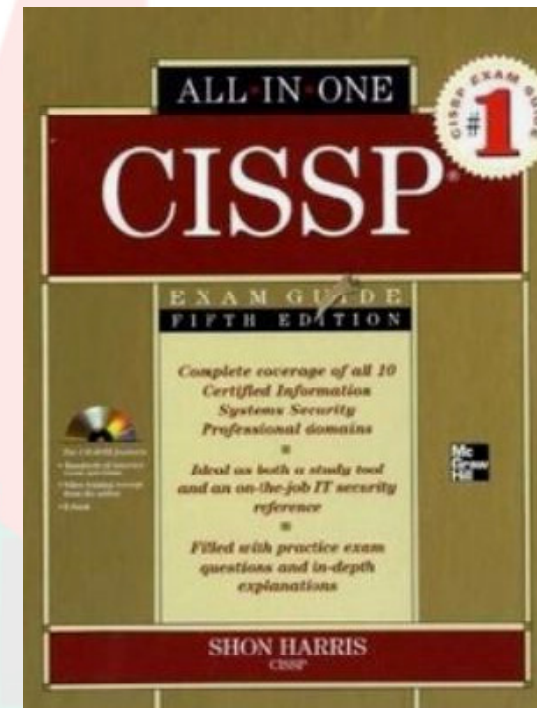
CISSP



- This certification acts as a backbone
- Broad coverage of security design, operations and management
- Has wide recognition
- Sourced content from well known publisher



UK CISSP Jobs Demand Trend (itjobswatch.co.uk)



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CCNA-Security



- This provided the hands-on 'nuts and bolts'
- Cisco provides an extensive package
- Offers some interesting tools and non-proprietary elements
- Links to the CCNP-Route, Switch and TSHOOT we already offer



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Security+



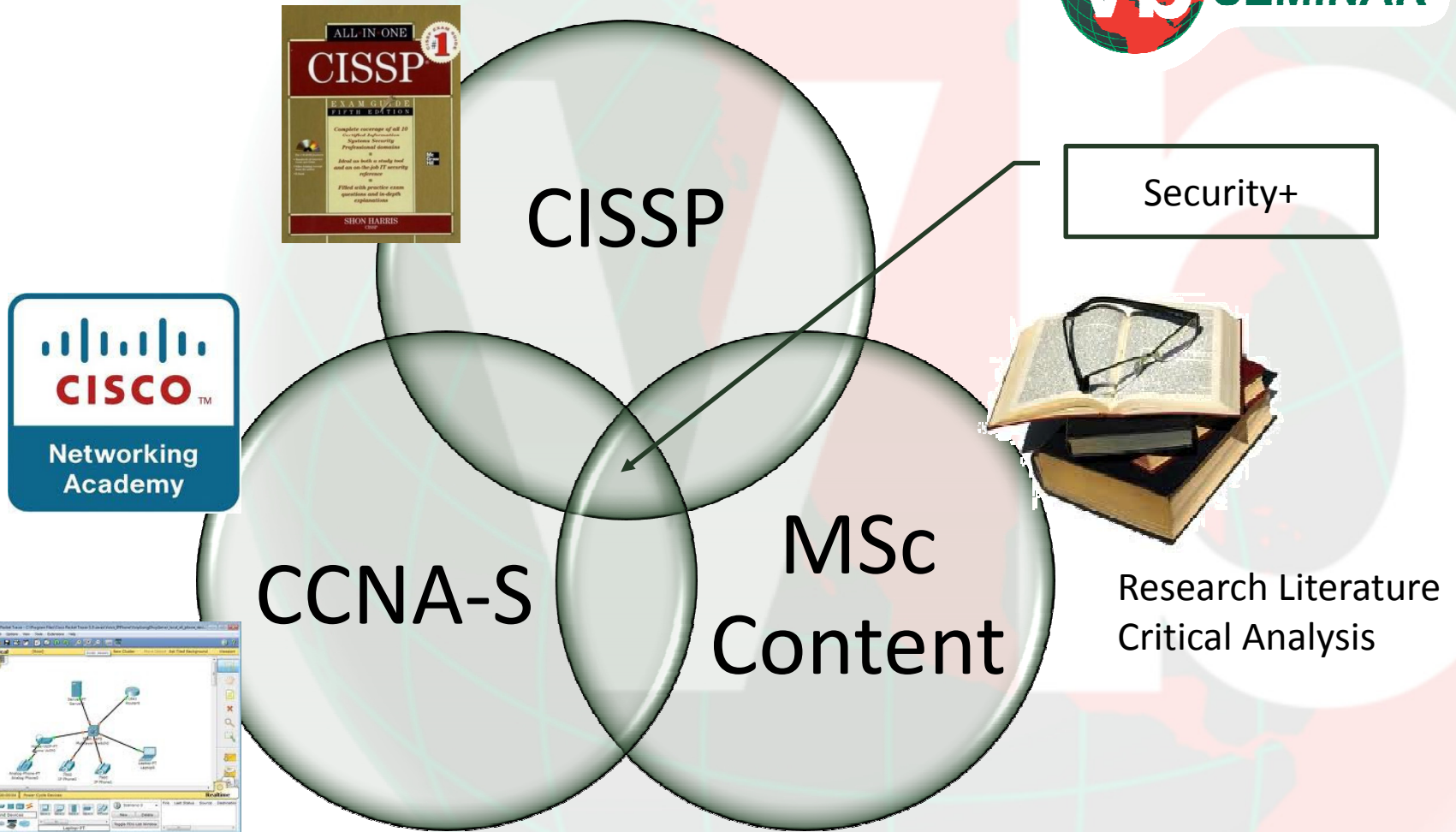
- Recognised as credit towards CISSP
- Content used from Cisco+McGraw Hill covers entire content
- Able to offer students a discount on certification as a bonus



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So, it becomes a mash up



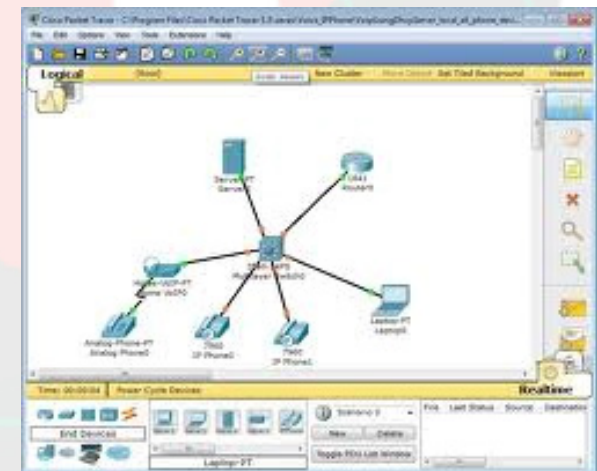
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Use of simulation



- We do have access to remote lab technology
- But, simulation takes it to the student, anywhere at any time
- Packet Tracer, provided by Cisco Systems
 - Includes proprietary and non-proprietary technologies
 - To be fair, Cisco are very open to what is 'Cisco only' and what is 'everyone else, with the latter being in the majority
- Its all about defence and knowing common offence
- Setting up secure network structures
 - VPN's and tunneling
 - Device hardening
 - Protocol control
 - ACL/Firewall, IDS/IPS



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Use of simulation



- Allows us to set the students complex challenges
- With open ended answers
- They are able to work on their own configuration
- They are able to share their construction with their tutor
- Tutor is then able to see active secured network created by student
- No kit cost, no scale or resource issues
- Works on Windows, Linux and has been ported to Mac



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Use of a single day school



- Cisco Compliance
- Assuring their practical experience (from using the simulation)
- Now on 'live kit'
 - Facilities currently hired from Cisco academies around the UK
- Putting the students in teams
 - As this is total distance learning, the probability of forming prior allegiances is near zero and the day school centre can randomly allocate
- Give the teams a challenge
- Observed and moderated by an 'instructor'
- Primary purpose to 'harden' a complex infrastructure



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Current status



- First cohort of students about to sit final exam for Network Security module (T828)
- Some students have already used the knowledge and skills gained to gain Cisco certifications:

“I passed the CCNA-S certification exam this morning with a score of 1000/1000!!”

“The structured learning of T828 has helped to build a better understanding ... which in turn made the certification exam a lot easier than I expected.”

“T828 was a massive help, I passed the exam, CCNP revalidated”



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Long term goal



- Building a distance learning, Masters-level Security qualification
- Not all the pieces are there yet
- We have
 - Information security management
 - Digital forensics
 - Network security and defence
- Nothing about offence
- Nothing about malware



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