



Title:	Cloud Networking APPROVED
Long Title:	Cloud Networking
Module Code:	COMP8055
Duration:	1 Semester
Credits:	5
NFQ Level:	Advanced
Field of Study:	Computer Science
Valid From:	Semester 1 - 2017/18 (September 2017)
Module Delivered in	2 programme(s)
Module Coordinator:	Sean McSweeney
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Module Description:	In this module, students gain practical skills in the design and configuration of virtual networks in the context of cloud Data Centre Networks (DCNs). They learn how policies can be used to control allocation of cloud DCN resources. They learn about the components and processes required for provision of cloud services.
Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
LO1	Analyse the structure of a cloud Data Centre Network (DCN).
LO2	Compare virtual networking standards, and describe the hypervisor, switch and router components of a virtual network.
LO3	Design and implement a virtual network including virtual switching and virtual routing components, using cloud DCN tools.
LO4	Devise and implement policies for cloud DCN management.
LO5	Describe the requirements of cloud services, and the components needed for the provision of cloud services.
Pre-requisite learning	
Incompatible Modules	
<i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module. You may not earn additional credit for the same learning and therefore you may not enrol in this module if you have successfully completed any modules in the incompatible list.</i>	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements	
<i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed. You may not enrol on this module if you have not acquired the learning specified in this section.</i>	
No requirements listed	
Co-requisites	
No Co Requisites listed	

Module Content & Assessment

Indicative Content

Cloud Data Center Network

CDCN architectures, topologies, evolution. Software-Defined Data Center (SDDC). IPv6 (and SIIT-DC).

Virtual Networking

Layer 2/3 - role of hypervisor. L2 bridging. L2 standard & distributed switch. L3 virtual distributed router. Virtual network standards (VXLAN, NVGRE, GENEVE), comparison with VPN (IPsec, GRE). Overlay vs underlay.

Cloud Network Management

Planning, configuration, and troubleshooting. Operational tasks (automation, monitoring, logging, auditing). Managing policies for performance, scalability.

Provision of Cloud Services

Requirements of cloud services: connectivity, availability, security. Components: cloud services gateway, load balancer, virtual distributed firewall, role of hypervisor. Example of cloud service provision (e.g. VoIP).

Assessment Breakdown

	%
Course Work	100.00%

Course Work

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Short Answer Questions	Assess students understanding of cloud DCN architectures and topologies, and how it relates to other components in an Software Defined Data Centre (SDDC).	1	20.0	Week 5
Practical/Skills Evaluation	Assessment of students abilities to create, configure and test virtual networks, and use cloud DCN tools.	3	30.0	Week 11
Short Answer Questions	Written assessment covering virtual networking, cloud network management, and cloud services provision.	3,4,5	40.0	Week 12
Reflective Journal	Diary recording practical work on virtual network configuration and cloud DCN management.	3,4	10.0	Every Week

No End of Module Formal Examination

Reassessment Requirement

Coursework Only

This module is reassessed solely on the basis of re-submitted coursework. There is no repeat written examination.

The institute reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time				
<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Lecture underpinning learning outcomes.	2.0	Every Week	2.00
Lab	Lab supporting content delivered in class.	2.0	Every Week	2.00
Independent & Directed Learning (Non-contact)	Independent study.	3.0	Every Week	3.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				4.00

Workload: Part Time				
<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Lecture underpinning learning outcomes.	2.0	Every Week	2.00
Lab	Lab supporting content delivered in class.	2.0	Every Week	2.00
Independent & Directed Learning (Non-contact)	Independent study.	3.0	Every Week	3.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				4.00

Module Resources

Recommended Book Resources

- Gary Lee 2014, *Cloud Networking: Understanding Cloud-based Data Center Networks*, Morgan Kaufmann [ISBN: 9780128007280]

Supplementary Book Resources

- Elver Sena Sosa 2016, *VCP6-NV Official Cert Guide (Exam #2V0-641)*, VMware Press [ISBN: 9780789754806]
- Anthony Burke, Ron Fuller, Andreas la Quiante 2017, *VMware NSX 6.2 for vSphere Essentials: A Practical Guide to Implementing Network Virtualization*, VMware Press [ISBN: 9780134513409]

Supplementary Article/Paper Resources

- A Botta, W De Donato, V Persico, A Pescapé 2015, *Integration of Cloud computing and Internet of Things: A survey*, Future Generation Computer Systems, March 2016, 54
http://wpage.unina.it/valerio.persico/pubs/CloudIoT_FGCS.pdf

Other Resources

- Website: VMware 2016, *VMware NSX: Install, Configure, Manage*
https://mylearn.vmware.com/mgrreg/course.s.cfm?ui=www_edu&a=one&id_subject=66684

Module Delivered in

Programme Code	Programme	Semester	Delivery
CR_KITMN_8	<u>Bachelor of Science (Honours) in IT Management</u>	5	Elective
CR_KITSP_7	<u>Bachelor of Science in Information Technology</u>	5	Mandatory