Assessment Details and Submission Guidelines	
Unit Code	MN503 – T1 2017
Unit Title	Overview of Internetworking
Assessment Type	Individual, written
Assessment Title	Network requirement analysis and plan
Purpose of the assessment (with ULO Mapping)	Main objectives of this assignment is to enable student to analyse a business case study, develop requirements, select networking devices for the given business case and plan a network design. After successful completion of this assignment, students should be able to: a. Analyse and discuss the significance of internetworking for contemporary organisations. b. Explain the role of internetworking to support business and technical goals through planning and design. c. Develop architectural internetworking design for the business, information, technology, and application domains.
Weight	15% of the total assessments
Total Marks	50
Word limit	700 (approximately 3 pages)
Due Date	Week 7, demonstrate during laboratory class and submit report on Moodle
Submission Guidelines	• All work must be submitted on Moodle by the due date along with a completed Assignment Cover Page. • The assignment must be in MS Word format, 1.5 spacing, 11-pt Calibri (Body) font and 2 cm margins on all four sides of your page with appropriate section headings. • Reference sources must be cited in the text of the report, and listed appropriately at the end in a reference list using IEEE referencing style.
Extension	• If an extension of time to submit work is required, a Special Consideration Application must be submitted directly to the School's Administration Officer, on academic reception level. You must submit this application within three working days of the assessment due date. Further information is available at: http://www.mit.edu.au/about-mit/institute-publications/policies-procedures-and-guidelines/specialconsiderationdeferment
Academic Misconduct	• Academic Misconduct is a serious offence. Depending on the seriousness of the case, penalties can vary from a written warning or zero marks to exclusion from the course or rescinding the degree. Students should make themselves familiar with the full policy and procedure available at: **http://www.mit.edu.au/about-mit/institute-publications/policies-procedures-and-guidelines/Plagiarism-Academic-Misconduct-Policy-Procedure**. For further information, please refer to the Academic Integrity Section in your Unit Description.

Assignment 1 Specification

Business case study: Choose one of the four business case studies provided in the appendix at page 5. You have to inform your instructor on the choice before start working on the assignment.

Description

For a chosen business case, write a report on the following points:
   a. Analyse and discuss the significance of internetworking for the chosen business case.
   b. Develop hardware requirements for a network with device specifications including series, model and features.
   c. Draw architectural internetworking design for the business in Netsim.

Write a report with the following contents

- Project Scope
- Challenges
- Project hardware requirements
  - Name of the network device with manufacturer's name, series, model, features and ports
  - Type of the cables
  - Name of the server, PC with specification such as operating system, RAM, hard disk etc.
- Network Design in Netsim (You **should not** use packet tracer)
- Outcomes / benefits of the proposed design
- Limitations and conclusions.

Marking criteria:

Section to be included in the report	Description of the section	Marks
Project scope	Outline of the report (in 3-4 sentences)	2
Challenges	Write at least 3 appropriate challenges you might face during network setup.	3
Project hardware requirements	- Name of the network device with manufacturer's name, series, model, features and ports	10
	- Type of the cables	2
	- Name of the server, PC with specification such as operating system, RAM, hard disk etc.	2
Network Design in Netsim	You **should not** use packet tracer Write justification for the selected network design	10
Outcomes	Write at least 2 outcomes of the network.	2
Limitations	Write limitations of the hardware devices used in your design.	2
Conclusions	Write clear conclusion of the case study.	2
Demonstration	Demonstrate detailed network design on Netsim.	10
Reference style	Follow IEEE reference style	5
	Total	50

Marking Rubrics

Grades	Excellent	Very Good	Good	Satisfactory	Unsatisfactory
Project scope	Concise and specific to the project	Topics are relevant and soundly analysed.	Generally relevant and analysed.	Some relevance and briefly presented.	This is not relevant to the assignment topic.
Challenges	Concise and specific to the project	Topics are relevant and soundly analysed.	Generally relevant and analysed.	Some relevance and briefly presented.	This is not relevant to the assignment topic.
Project hardware requirements	Demonstrated excellent ability to think critically and sourced reference material appropriately	Demonstrated excellent ability to think critically but did not source reference material appropriately	Demonstrated ability to think critically and sourced reference material appropriately	Demonstrated ability to think critically and did not source reference material appropriately	Did not demonstrate ability to think critically and did not source reference material appropriately
Network Design in Netsim	Logic is clear and easy to follow with strong arguments	Consistency logical and convincing	Mostly consistent logical and convincing	Adequate cohesion and conviction	Argument is confused and disjointed
Outcomes	All elements are present and very well integrated.	Components present with good cohesive	Components present and mostly well integrated	Most components present	Proposal lacks structure.
Limitations	All elements are present and very well integrated.	Components present with good cohesive	Components present and mostly well integrated	Most components present	Proposal lacks structure.
Conclusions	All elements are present and very well integrated.	Components present with good cohesive	Components present and mostly well integrated	Most components present	Proposal lacks structure.
Demonstration	Logic is clear and easy to follow with strong arguments	Consistency logical and convincing	Mostly consistent logical and convincing	Adequate cohesion and conviction	Argument is confused and disjointed
IEEE Reference style	Clear styles with excellent source of references.	Clear referencing style	Generally good referencing style	Sometimes clear referencing style	Lacks consistency with many errors

Appendix

Business case study 1[1]

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[1] https://www1.cisco.com/c/dam/en/us/solutions/collateral/industry-solutions/service-overview-c22-736810.pdf

CISCO

Cisco Connected Health Strategy and Operations Services
Solution Overview
Cisco Public

Clinicians are facing increasing pressure to serve a higher volume of complex patient cases with more frequent interaction and access outside of the standard clinic setting. While some clinical teams have already adopted forms of telehealth, limited planning and integrative design marginalizes the full value of the sustainable ROI they can achieve.

At Cisco, we are redefining the patient care continuum to meet both consumers' access needs and clinicians' constraints. The Cisco® telehealth program planning service involves creating a tailored operating plan that incorporates people, process, and technology across all in-scope services and units. This integrative offering facilitates interoperable information exchange and ongoing care delivery regardless of location, improving the satisfaction of clinicians and patients alike. After all, time and convenience are of the essence.

The Methodology

Cisco delivers adoption services through several core activities:

- Creating the telehealth operating plan, including workflows and systems integration requirements

- Assembling high-value use case scenarios and change management assets

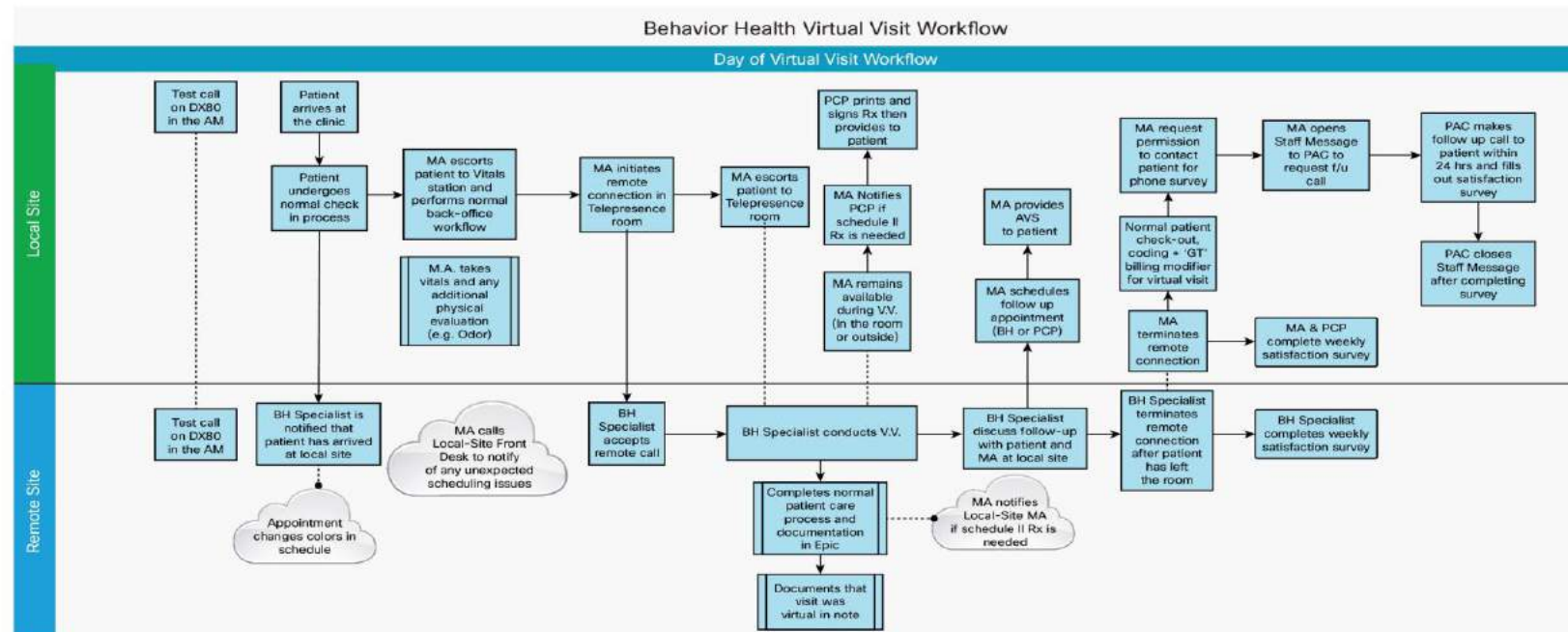- Crafting tailored procedural references to maximize service functionality

The Benefits

The Cisco telehealth program planning service can help you achieve the following:

- Increased patient flow efficiency and reduces readmissions

- Increased patient satisfaction and financial performance

- Maximized sustainable usage and integration of telehealth

- Maximized timely patient access to specialists

2

Cisco Connected Health Strategy and Operations Services
Solution Overview
Cisco Public

- Planning support and process design—Tailored policies and procedures to ensure sustainable telehealth integration and utilization.

Behavior Health Virtual Visit Workflow

Next Steps

For more information on Cisco telehealth program planning services,

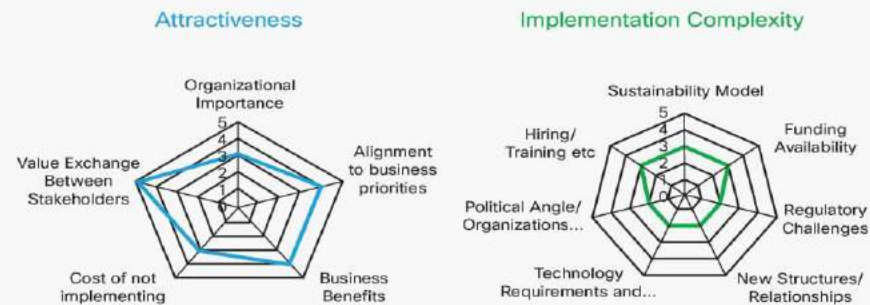- Email: hpbt@cisco.com

- Visit: www.cisco.com/go/healthcare

Prepared by: *Dr Mahbub Ahmed*   Moderated by: *A/Prof Nalin Sharda*   *Mar, 2017*

Business case study 2[2]

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CISCO

Cisco Associate Productivity for Hospitality
At a Glance
Cisco Public

Empowering the Digital Employee
Cisco Associate Productivity for Hospitality

Benefits

· Enable customer service by equipping employees with mobile devices.

· Improve responsiveness with onsite Wi-Fi networks.

· Speed on-boarding with on-demand training.

· Increase productivity with on-demand education.

· Optimize staffing based on traffic patterns and analytics.

Making Employees More Productive

With the transition to digital technologies, hospitality employees are evolving from clerks and concierges sitting behind a desk into flexible, trusted advisors to your guests. Today's hotels, casinos, cruise lines, and convention centers are using mobile technologies to help these workers be more responsive, better trained, and always accessible to visitors.

Cisco® studies show that the single greatest financial benefit of digitization is in improving the productivity of employees and associates. With digitization you can also create on-premises applications that provide innovative services and promotions. Most importantly, with these capabilities you can capture, digitize, and transform guest data into insights that drive employee effectiveness and help make every visitor's stay memorable.

Transforming the Guest Experience

All too often in today's hospitality businesses, weary, impatient guests still have to wait for hospitality staff to search for reservations, assign a room, and process requests for upgrades and extra services. Workers are frequently slow to respond to guest needs, who wait to be served in their rooms, at the poolside, or at the front desk.

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[2] https://www.cisco.com/c/dam/en/us/solutions/collateral/industry-solutions/at-a-glance-c45-737570.pdf

The Cisco Associate Productivity for Hospitality solution transforms this experience. Based on a powerful, secure Wi-Fi network, the Cisco mobile solution enables workers to deliver more personalized experiences based on a rich rules engine integrated with guest profiles from past purchasing data.

To help them advise your guests more effectively, associates can access a pool of virtual experts to provide face-to-face concierge services on their mobile devices: This capability helps associates answer questions about local entertainment, site-seeing, shopping, and other excursions.

Cisco solutions also help train employees by enabling faster on-boarding for new workers. If your company is launching a new facility—or launching a new initiative—employees can be brought up to date about new offerings and capabilities on short notice, on demand, or as a group. By providing ready access to information that helps associates do their work better, you increase job satisfaction, reduce turnover, and improve the traveler experience.

Cisco helps define and deliver a workforce strategy that backs your business goals and initiatives. This hospitality solution helps to achieve better employee productivity and optimize your operations, and increases revenue opportunities through a real-time, value-added relationship between associate and guest.

Next Steps

Let us help you define and launch a winning productivity strategy for your operation, helping you make workers more effective, improve responsiveness, and reimagine the travel experience. For additional information, visit www.cisco.com/go/hospitality.

"We are able to return to the days when people stayed at hotels, and the experience was significantly better than what they had at home. It is wonderful to be bringing back the grand tradition of exceptional hospitality."

— **Scott Watts**
Corporate Director of Information Technology,
PCH Hotels and Resorts

Prepared by: *Dr Mahbub Ahmed*   Moderated by: *A/Prof Nalin Sharda*   *Mar, 2017*

Business case study 3[3]

CISCO

Creating an Agile, More Connected Learning Environment

Open Access College

Size: 200 teachers
Industry: Education
Location: Australia

Solutions

- Enhancing remote teaching with interactive online platform
- Expanding access to connected learning with a high performing network
- Improving staff interactions with video conferencing for meetings and training

Results

Using Cisco technology to digitize and transform education, OAC:

- Increased agility to meet future course enrollment needs
- Reduced annual phone costs by over 96% with connected network learning
- Achieved a tenfold increase in enrollment over five years for statewide language classes

From One-Way Communication to Digital Interaction

Teachers at Open Access College (OAC) campuses in Adelaide and Port Augusta, Australia, are currently leading lessons remotely. These sessions are designed for those unable to access learning in any other way.

Until recently, classes used audio conferencing, delivered to students between five and 18-years-old who were isolated through illness or geography. But this type of communication was pretty much one-way, and it was costly. When its annual phone bill reached nearly US$ 1.2 (AUD$ 1.5) million, OAC was asked by the state education department to cut spending by a third.

"We sought technology that would not only significantly reduce costs, but also enhance our teaching in a more engaged manner," recalls Julie Taylor, Principal.

To address those challenges, OAC introduced Cisco WebEx® Training Center. This interactive platform conjures up an exciting virtual classroom where teachers and students share resources, including visual materials and movies. Children can work on projects in breakout groups while the teacher monitors their progress. Everyone can use a whiteboard and see each other's desktops.

Teachers have more flexibility in how they use their time. They can give extra help at the end of classes to individuals who need it, or set up feedback sessions on the fly. With this approach, teachers can deliver high quality education in a flexible, agile manner.

"Through WebEx we can bring more color and life to our lessons," says Robin Sleeman, Assistant Principal. "That's very powerful. It gives us enhanced contact with students, so we can support their learning in ways that weren't possible before."

More Effective Teaching with Connected Learning

Students are able to access learning anywhere, any time, on almost any device. Teachers can work freely on campus with reliable connections supported by Cisco wireless access points. No longer tied to a single location, they can offer a more enriched educational experience.

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[3] http://www.cisco.com/c/dam/en/us/solutions/collateral/industry-solutions/openaccess-voc-case-study.pdf

Open Access College
Education

Using Cisco technology to digitize and transform education, OAC:

Increased agility to meet future course enrollment needs

Reduced annual phone costs by over 96% with connected network learning

Achieved a tenfold increase in enrollment over five years for statewide language classes

Quality distance learning is underpinned by highly reliable, secure WAN connectivity to remote locations. The Cisco Catalyst® switching foundation also provides speed for bandwidth-hungry applications like graphics rendering, which is ideal for subjects like photography.

"With Cisco networking, we have greater agility and can reliably connect to multiple remote areas simultaneously over video," says Kenneth Burgoyne, Data and Infrastructure Manager.

Staff and leadership meetings between campuses now occur over a Cisco TelePresence® system. With video conferencing endpoints in meeting rooms and all leaders' offices, interactions are much more engaging. Additionally, the school can cut travel costs, while retaining face-to-face interactions.

OAC staff and students can meet the way they want, with video, audio, and content sharing. Cisco Collaboration Meeting Rooms Cloud combines the simplicity of Cisco WebEx meetings with an all-inclusive video bridging capability. This gives an always-on, always-available meeting experience. For example, OAC can provide teacher training, or make it easy for remote students to participate in onsite workshops.

Lessons are recorded, so students who missed a class can watch it in full. All recordings are stored in the school's learning management system for reference or revision purposes.

The system also captures evidence of students' progress, vital for teachers' records and planning.

To safeguard this connected learning environment, the college selected award-winning Cisco technical support.

"We can't afford any downtime, so we have Smart Net Total Care on all our Cisco products," says Kenneth Burgoyne. "That level of maintenance and support is critical to our operation."

Higher Student Engagement at a Far Lower Cost

Cisco WebEx is now the default platform for scheduled OAC lessons. Between 10 and 15 concurrent sessions run at any one time. That's more than 1,000 teaching hours every day.

With one annual Cisco WebEx subscription, the college has slashed its phone bill by over 96 percent, for a savings of US$1.37 (AUD$ 1.8) million per year.

The Cisco connected learning foundation, with secure wired and wireless connections, helps OAC scale quickly and grow faster. The primary years' language partnership program is a good example. This popular program offers specialist teaching to school classes throughout South Australia. By its fifth year enrolment had soared from 400 to 4,000 students. That success and scalability wouldn't have been achievable before.

Open Access College
Education

"*Students have better relationships with their teachers and each other, and a deeper understanding of their work requirements. That helps them achieve to the very best of their ability.*"

Julie Taylor
Principal, Open Access College

All age groups use the technology effectively. Senior students develop independent learning skills by logging in, unsupervised, to classes. The school will soon offer adults the chance to participate in parents' forums and consultations remotely.

Teachers have been empowered to enhance their methods and practices through face-to-face interaction with students. The improved learning environment has stimulated much higher levels of student engagement.

"Though digitization, we're able to innovate and be more agile in the way we deliver education to remote areas," Julie Taylor concludes. "Students have better relationships with their teachers and each other, and a deeper understanding of their work requirements. That helps them achieve to the very best of their ability, which is exactly what we're aiming for."

For More Information
To learn more about the Cisco solutions featured in this case study, visit the following webpages:

Customer stories:
www.cisco.com/go/customerstories

Collaboration:
www.cisco.com/go/collaboration

Networking:
www.cisco.com/go/networking

Services:
www.cisco.com/go/services

Products and Services

Switching
- Cisco Catalyst 2960-X Series Switches

Routing
- Cisco 2900 Series Integrated Services Routers

Wireless
- Cisco Aironet 2702I Series Access Points
- Cisco 5520 Wireless Controller

Collaboration
- Cisco WebEx Training Centre
- Cisco Collaboration Meeting Rooms
- Cisco TelePresence SX10 Quick Set
- Cisco TelePresence SX20 Quick Set
- Cisco TelePresence SX80 Codec

Services
- Cisco Smart Net Total Care

CISCO

Business case study 4[4]

ABMU Health Board Automates Operations While Revitalizing Patient and Staff Experiences with Cisco Digital Network Architecture

Abertawe Bro Morgannwg University Health Board

Size: 16,000 staff
Industry: Healthcare
Location: Wales

Solutions

- Evolving the network and IT operations with Cisco Digital Network Architecture, and improving workforce, patient, and visitor experience with Cisco Wi-Fi
- Reducing risk from cyber threats with integrated Cisco security, with simplification from Cisco Prime low-touch IT management
- Collaborating effectively over Cisco Unified Communications and Jabber technology, virtualized on Cisco UCS server

Digitizing clinical expertise and boosting productivity

The Abertawe Bro Morgannwg University (ABMU) Health Board formulated a vision to unburden doctors and nurses from filling out forms and writing notes, while making clinicians more mobile for better care at the bedside and out in the community.

Hamish Laing, executive medical director and CIO, says: "People are living longer and the complexity of care is increasing. We also face financial constraints and skill gaps from staff leaving or approaching retirement. Digitization addresses these challenges by enabling carers to capture and share clinical expertise, while working more efficiently from anywhere."

Looking after around 500,000 people in South West Wales and also providing a national burns center covering South Wales and South West England, ABMU adopted Cisco® Digital Network Architecture as the foundation of a progressive IT strategy. The new infrastructure serves four acute hospitals, community and mental health services, primary care, air ambulance, and home care services.

Gareth Siddell, network manager, explains: "We needed to help the organization to move faster, more efficiently and more securely. To do that we had to transform our network and IT operations with the latest advances in mobility, cloud, analytics, and the Internet of Things."

Secure access automates network operations

The IT infrastructure now connects the Neath Port Talbot, Morriston, Singleton, and Princess of Wales hospitals. Cisco switches, wireless infrastructure, and servers form a high-speed IP backbone, ensuring clinical applications and large data files flow quickly and safely. Meanwhile, with pervasive Cisco Wi-Fi, staff and visitors enjoy a more connected mobile experience.

The wired and wireless networks are both managed through Cisco Prime™ Infrastructure. A single view means the IT team can simplify and automate management tasks much faster than before while proactively monitoring and controlling network usage. Services can be deployed quickly and run anywhere, independent of underlying platform: physical, virtual, on-premises, or cloud-based.

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[4] http://www.cisco.com/c/dam/en/us/solutions/collateral/industry-solutions/abmu-voc-case-study.pdf

Abertawe Bro Morgannwg University Health Board
Healthcare

Cisco Digital Network Architecture is helping ABMU to benefit from:

Automated network operations with secure access

Fast and effective emergency responses

Improved and efficient in-home care support

End-to-end security has greatly reduced cyber threats. As part of the Digital Network Architecture design, Cisco next-generation firewalls at the network perimeter are complemented with embedded protection throughout the switching fabric. The IT team sets security policies using Cisco Identity Services Engine (ISE), controlling which users and devices can connect to the network and which data and resources they can access.

"Hospitals must have robust safety processes in place," adds Gareth Siddell. "With Cisco ISE, only authorized personnel can use mobile devices to access a drug cabinet. Additionally, pharmacy inventory tracking is automated by stock level and by prescriber."

Agility with connected healthcare

This improved service has particularly benefited the Emergency Medical Retrieval and Transfer Service (EMRTS) Cymru and the medics who work on board the Wales Air Ambulance Charity helicopters. This national service is also hosted by ABMU.

EMRTS staff scan over 900 emergency calls during a 12-hour shift, looking for the four or five most ill or injured patients to send the critical care team to across Wales. Every second counts. Previously, road and helicopter response teams were hampered by patchy wireless coverage and slow fixed connections.

With ambitious commissioning of the all Wales service, the IT team delivered a secure network infrastructure using Cisco networks and mobile data access within two weeks. Given the time it would take to order fixed communication lines and install relevant infrastructure, this would normally take around six months. Without the agile networking solution, the service could not have started on time.

Now, with LAN speeds of 10 Mbps and up to 30 Mbps for Wi-Fi, responders hit the ground running. With Cisco 802.11ac wireless access points, greater scale and coverage help ABMU connect an ever-increasing number of devices more reliably. The Cisco 819 Integrated Services Router (ISR) assists with remote high-speed communications in mobile applications, improving effectiveness and productivity of air ambulance operations.

David Rawlinson, EMRTS Cymru clinical informatics manager, says: "It's much quicker to communicate and share live information like weather and travel conditions, and the situation at the accident scene. That means we can target critical cases sooner for better-informed responses."

Empowered hospital workers can be where they need to be for efficient and effective care. Equipped with Cisco Unified IP and Wireless Phones, it's much easier for them to stay in contact and work on the move.

Laptops and tablets loaded with Cisco Jabber® technology mean they can see when colleagues are available and send a chat message for an instant response. Or pull in other specialists on a video call if a multidisciplinary team discussion is needed. To simplify management, Cisco Unified Communications and Jabber software has been virtualized on Cisco UCS® servers.

Abertawe Bro Morgannwg University Health Board
Healthcare

"Digitization is how we'll continue to improve our clinical services. The network is now an integrated part of the business, automatically adjusting to the organization's needs dynamically."

Hamish Laing
Executive Medical Director and CIO
ABMU Health Board

Care in the community and in the future

ABMU also oversees more than 300 doctors' surgeries, 275 dentists, 125 pharmacies and 60 optometry premises. The digitized network infrastructure has transformed the delivery of outreach healthcare services. "With improved remote monitoring we're able to extend care plans, so more patients can stay at home with the support they need," says Gareth Siddell.

Home caregivers are far more productive, too. Before, they might have to conduct a routine task, such as setting up an infusion pump, and then make several return visits. Now, such procedures can be tracked remotely, saving time and travel.

All this is only the start. ABMU is looking to expand the potential of its Cisco Digital Network Architecture platform, leveraging mobility with services, such as wayfinding and location-based services in the hospitals for staff, visitors and patients. This would help further improve efficiency and lower costs, for example, through the real-time monitoring of blood and drugs supplies, while helping staff monitor and track the location of emergency equipment. Mobility also helps to track and interact with patients.

Hamish Laing concludes, "Digitization is how we'll continue to improve our clinical services. The network is now an integrated part of the business, automatically adjusting to the organization's needs dynamically."

For More Information

To learn more about the Cisco solutions featured in this case study, visit the following

Cisco customer stories:
www.cisco.com/go/customerstories

Cisco wireless and mobility:
www.cisco.com/go/wireless

Cisco routing and switching:
www.cisco.com/go/networking

Cisco security:
www.cisco.com/go/security

Cisco Prime Infrastructure:
www.cisco.com/go/prime

Cisco Unified Communications:
www.cisco.com/go/uc

Cisco UCS servers:
www.cisco.com/go/ucs

Products and Services

Wireless
- Cisco Aironet® 3700 Series access points
- Cisco 5500 Series Wireless Controllers
- Cisco 7900 Series Wireless IP Phones
- Cisco Mobility Services Engine

Routing and Switching
- Cisco Catalyst® 2960-X Series Switches
- Cisco Catalyst 3850 and 6500 Series Switches
- Cisco 819 Integrated Services Router

Security
- Cisco ASA 5500-X with FirePOWER™ Services
- Cisco Identity Services Engine (ISE)
- Cisco Security Manager

Management
- Cisco Prime Infrastructure

Unified Communication
- Cisco Unified Communications Manager
- Cisco Jabber with Unity Unified Messaging

Data Centre
- Cisco UCS Servers

CISCO