

Cloud Computing Model for Health Care Services in Sudan
Sudan University of science and Technology
Faculty of Computer science

Cloud
Model for
Services in



computing
Health Care
Sudan

نموذج حوسبة سحابية لخدمات العناية الطبيه فى السودان

This thesis is submitted in partial fulfillment of the academic
requirements for degree of master

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إقرار

انا الموقع ادناه أقر باللي تمؤلف الوحيد لرسالة الماجستير المعنونة ب نموذج
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وهي منتج فكري أصلي، وبإختياري اعطى حقوق ضبع وتظهر هذا العمل لكتبة الدراسات العليا جامعة السودان

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الايه

اللَّهُ لَا إِلَهَ إِلَّا هُوَ الْحَيُّ الْقَيُّومُ لَا تَأْخُذُهُ سِنَّةٌ وَلَا نَوْمٌ لَهُ مَا فِي

السَّمَاوَاتِ وَمَا فِي الْأَرْضِ مَنْ ذَا الَّذِي يَشْفَعُ عِنْدَهُ إِلَّا بِإِذْنِهِ يَعْلَمُ مَا بَيْنَ
أَيْدِيهِمْ وَمَا خَلْفَهُمْ وَلَا يُحِيطُونَ بِشَيْءٍ مِنْ عِلْمِهِ إِلَّا بِمَا شَاءَ وَسِعَ كُرْسِيُّهُ
السَّمَاوَاتِ وَالْأَرْضَ وَلَا يَئُودُهُ حِفْظُهُمَا وَهُوَ الْعَلِيُّ الْعَظِيمُ (255)

آية الكرسي - سورة البقرة

قَالَ يَا أَيُّهَا الْمَلَأُ أَيُّكُمْ يَأْتِينِي بِعَرْشِهَا قَبْلَ أَنْ يَأْتُونِي مُسْلِمِينَ قُلْ

عَفْرِيْتُ مِنْ الْجِنَّ أَنَا آتِيكَ بِهِ قَبْلَ أَنْ تَقُومَ مِنْ مَقَامِكَ وَإِنِّي عَلَيْهِ لَقَوِيٌّ أَمِينٌ

(39) قَالَ الَّذِي عِنْدَهُ عِلْمٌ مِنَ الْكِتَابِ أَنَا آتِيكَ بِهِ قَبْلَ أَنْ يَرْتَدَّ إِلَيْكَ طَرْفُكَ

فَلَمَّا رَأَاهُ مُسْتَقَرًّا عِنْدَهُ قَالَ هَذَا مِنْ فَضْلِ رَبِّي لِيَبْلُوَنِي أَأَشْكُرُ أَمْ أَكْفُرُ وَمَنْ

شَكَرَ فَإِنَّمَا يَشْكُرُ لِنَفْسِهِ وَمَنْ كَفَرَ فَإِنَّ رَبِّي غَنِيٌّ كَرِيمٌ (النمل)

Dedication

To whom she gave more than enough.....my beloved mother

To whom he encourages me.....my father

To my lovely family

To Mohammed, Mustafa, Rivan, Abubaker for the day in

Khartoum ,—keep linking up, sweethearts!

This is for you, Nariman . Thanks for always

being there in all master program times.

To my dear friends

My everlasting inspiration

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Fakherel

din Elnagi

May 2015,khartoum

ABSTRACT

Besides primary health care services in cloud computing, the challenge of integrating care systems with each other, the confidentiality of data, resource sharing and resources, the quality of performance and reduce cost all represent hardwired now challenges in the world of Information and Communication Technology In this research has been a model for the value of cloud design was to develop a system of referral mail to run on this environment. The methodology followed in this research is to create the initial environment of cloud computing in an environment imaginative using Virtual box and through the modification in some components of the open stack using a roll Python to fit with the proposed structure, and then has writing system for hauling mail as a service on the cloud using PHP language and the rules of MY SQL data, supported by some screens for assignment system after studying and analyzing the practical reality of the referral in Sudan. The aim of this thesis to explain the importance of building structural model for cloud computing to put a referral system as the first health service in the Sudan in this framework, and that this research is showing

the way for further research in the study of the future of cloud computing and visions around beneficiaries of technical solutions available to reduce the complexity of time and space. The final result of this research is to build a model for the referral system on the Sudan used the cloud computing environment, and the development of proposals and recommendations for future development.

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ملخص البحث

الى جانب خدمات الرعاية الصحية الاولية فى الحوسبة السحابية فإن تحدي تكامل أنظمة الرعاية مع بعضها، سرية البيانات ، مشاركة المصادر والموارد ، جودة الاداء وتقليل التكلفة كلها تمثل تحديات ماثلة الان فى عالم تكنولوجيا المعلومات والاتصالات ففى هذا البحث تم تصميم نموذج لقيمه سحابية وتم وضع نظام للاحالة الالكترونى ليعمل على هذه البيئة .

المنهجية التى اتبعت فى هذا البحث هى تهيئة البيئة الاولية للحوسبة السحابية فى بيئه تخيلية باستخدام Virtual box وذلك من خلال تعديل فى بعض مكونات ال open stack باستخدام لغة بايثون لتتناسب مع الهيكلية المقترحة ، ومن ثم تمت كتابة نظام للاحالة

الالكترونى كخدمة على هذه السحابة باستخدام لغة php وقواعد البيانات MY SQL مدعمة

ببعض الشاشات لنظام الاحالة وذلك بعد دراسة وتحليل الواقع العملى للإحالة فى السودان .

تهدف هذه الاطروحة لتوضيح أهمية بناء نموذج هيكلى لحوسبة سحابية لوضع نظام الاحالة

الالكترونى كأول خدمة صحية فى السودان فى هذا الإطار ، كما ان هذا البحث ينىر- الطريق

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التقنية المتاحة لتقليل تعقيد الوقت والمكان.

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List of Abbreviations

IT: Information Technology.

NIST: National Institute of Standards and Technology.

WHO: World Health Organization.

D2D: Doctor to Doctor.

D2N: Doctor to Nurse.

P2D: Patient to Doctor.

P2N: Patient to Nurse.

IaaS: Infrastructure-as-a-Service.

PaaS: Platform-as-a-Service.

SaaS: Software-as-a-Service.

PDAs: [Professional Development and Appraisal System](#).

SLA: Service level Agreement.

HIT: Health information technology.

EHRs: Electronic Health Record.

CT: Computed Tomography.

MRI: Magnetic Resonance Imaging.

ICT: Information and Communication Technology.

HMIS: Hospital Management Information System.

PACS: Picture Archiving and Communication Systems.

EMRS: Electronic Medical Records system.

EHR :Electronic Health Records system.

PHRS: Personal Healthcare Records system.

CP: Cloud Providers.

QoS: Quality of services.

UCI: Unified Cloud Interface.

DMTF: Distributed Management Task Force.

UCS: Unified Computing Systems.

API: Application Program Interface.

VLAN: Local Area Network.

CCU: A coronary care unit.

HDU: The High Dependency Unit.

ICU: The Intensive Care Unit

CHAPTER ONE

INTRODUCTION

CHAPTER TWO

LITERATURE REVIEW

CHAPTER THREE

RESEARCH METHODOLOGY

CHAPTER FOUR

RESEARCH DISCUSSION AND PROPOSED OPEN STACK FRAME WORK DESIGN

CHAPTER FIVE

PROPOSED REFERRAL SYSTEM

CHAPTER SIX

CONCLUSION AND FUTURE WORK

