

Project Budget Number:
Project Title: ***The National Health Information Network Jamaica***
Project Short Title: *Health Network Jamaica*
Start Date: September 2012
Estimated End Date: February 2014
Government Coop. Agency: Ministry of Health
Implementing Agency: Ministry of Health, Jamaica
Project Site: Jamaica
Beneficiary Country: Jamaica
Project Manager:

SUMMARY OF CONTRIBUTIONS	
A) Project Budget	
Description	US\$
Project Personnel	60,000
Equipment	2,323,908
Software Licenses	1,245,000
Training of Trainers	
Fellowships	
Monitoring & Evaluation	
Miscellaneous	362,890.80
ITU Admin Support Cost	
Total:	3,991,798.80
B) Cost Sharing	
MOH Contribution (in kind)	
- Trainers	
- Training Room / Business Centre	
- Communication Facilities	

Brief Description:

This project aims at establishing a robust, sustainable and affordable National Health Information Network (NHIN) in order to provide a common platform for health information access and information exchange across health facilities and paramedical services in the public and private sectors.

To achieve this objective, funding partner shall jointly with the Ministry of Health:

- Establish a wide area network accessible to all healthcare facility sites
- Strengthen and standardize technology employed at the sites (Gateway solutions)
- Consolidate and strengthen the deployment of identified Electronic Health Record (EHR) module solutions (EHIS, EHR, Mental Health Solution)

On Behalf of	Signature	Date	Name/Title
ITU:	_____	_____	Director of BDT
	_____	_____	
	_____	_____	
	_____	_____	

Background & Context

▪ General introduction

The Ministry of Health (MOH) is in the business of providing public health care to the Jamaican citizens and visitors alike. It is mandated to ensure the provision of quality health services and also to promote healthy lifestyles and environmental practices. The MOH employs approximately 14,000 persons, incorporating health professionals, specialists, managers, and other support staff across many disciplines spanning approximately 313 primary care facilities, 24 hospitals, health departments, laboratories as well as the head office.

In 1999, the management of health services (health facilities) was regionalized, dividing the country into four health regions. Health facilities, since then have been managed directly by the Regional Health Authorities (RHAs). Health facilities are classified (e.g. Type A, B C, or Specialists for secondary health care; Type 1, 2, 3, 4 and 5 for primary health care) according to the level of service that it provides to the public. These services are determined by a number of factors including population distribution, resource availability and community development.

The Ministry of Health provides policy, regulation and monitoring functions whilst the RHAs are responsible for health care delivery. Hence, data collection activities occur at the points of care mainly at health facilities and these data are submitted to the MOH for collation and validation/verification in manual and electronic formats and are largely aggregated.

Top-level Information System challenges include:

- Inability to effectively measure and improved service levels to increase patient care
- Relatively inflexible to adapt to new decisions/directions and health services dynamics
- Inadequacy of Interconnected infrastructures encompassing an important national/global network of patients, partners, and suppliers
- Inability to deliver health critical data, voice, and video traffic with timeliness, consistency, reliability, and security
- Inability to optimize the WAN telecommunications services, and minimize the costs; which is likely to be one of the larger line items in the MIS budget
- Inability to effectively evaluation performance-to-cost ratios

▪ Present situation/context

Currently, the MOH has a semi-hybrid Health Information System (HIS) with both manual and electronic systems; but no true electronic documents. The clinical and administrative information systems generally consist of standalone databases, be it local to a site office, or regional (spanning a few parishes). Applications that lack interoperability are:

- Incompletely implemented
- Not standardized
- Incompletely defined functional and technological requirements
- Most have not been evaluated formally

Despite this, the most promising systems (though in the minority) include the Environmental Health Information System (EHIS) and Psych Report (Community Mental Health Service). Both systems are capable of central deployment with easy browser-based access at all health facilities, once an adequate and robust networking infrastructure is designed and implemented.

▪ Problem statement/ Description of the problem

The MOH and its agencies lack an interoperable EHR system, which allows for efficient, timely, complete and accurate data collection and management across both public and private sector facilities. This is coupled with a fragmented IT network infrastructure which is not capable of supporting the deployment of any centralized healthcare software.

▪ National/Government Commitment

In order to achieve sustainable public health services and improved health outcomes, health systems strengthening, which includes health information systems strengthening and modernization, is essential [1]. The National Health Information System (NHIS) includes both clinical and administrative (corporate) information systems relevant to the health care industry. At the core of the NHIS is the Electronic Health Records (EHR) System, which is required to provide anytime, anywhere access to clinical information for patient care whether at health centres, hospitals or at the community level, and including disease surveillance which has implications for population health.

In the context of Jamaica and the NHIS, the Strategic Plan of the MOH and the Vision 2030 Jamaica National Development Plan together refer to the following as national strategies [2]:

- Surveillance of Communicable and Non-communicable Diseases and Injuries
- Primary Health Care
- Health and the environment
- Health Promotion
- The health infrastructure (including Information and Communication Technologies)
- Human Resources for Health
- Health Financing

In order to adequately achieve the objectives associated with these national strategies, attention must be given to a wide range of services, programs and systems together with the associated health information.

Moreover, in April 2010, the MOH established a Health Information and Technologies Steering Committee, which is responsible for strengthening and modernizing the NHIS. The committee through its deliberations embraces the idea of an Enterprise Architecture (EA) [1] such that Information systems can be seen as one seamless service with improved management, maintenance and quality of service. The first action was the pursuit of the Health Metric Network (HMN) assessment.

- *The Health Metrics Network (HMN) is a global health partnership that focuses on health improvements by enhancing the availability and use of health information for better evidence-based planning and decision-making [3].*
- *Furthermore, the HMN framework supports the NHIS as an entire entity consisting of components rather than being based on diseases and programs. Accordingly, the framework appreciates both the clinical and administrative information systems as well as aspects related to governance.*
- *In response to the needs of stakeholders, the HMN is also supporting the application of the principles of Enterprise Architecture to the NHIS. An EA provides a comprehensive description of all the elements and relationships in an organization, and therefore aligns its vision, mission statement, goals and objectives to the information system.*

This approach helps to identify components to be aligned within the NHIS and thus reduces the risks of fragmentation and duplication while enhancing interoperability, which is the sharing or exchange of data.

The MOH is determined to establish a National Health Information Network (NHIN). This refers to a collection of healthcare-related standards, protocols, legal agreements, specifications, and services that facilitates the secure exchange of health information over a network [4].

The NHIN is a key component of the NHIS strengthening and modernization strategy and will provide a common platform for health information access and information exchange across health facilities and paramedical services in the public and private sectors. Considering the internal geographical migratory nature of the Jamaican population and the selection of public or private sector facilities for access to health services by citizens, the NHIN needs to be robust in providing secure, reliable and redundant networking infrastructure to support the EHR.

These priorities, together with the establishment of the MOH's Health Information & Technologies Steering Committee, demonstrate the seriousness of the MOH and its high level of commitment in adopting affordable and sustainable ICT applications for the healthcare sector in order to improve quality, safety, effectiveness of care with improved treatment outcomes and population health.

- Process followed in Project identification/formulation

The ICT environment in the health sector was already under careful examination in preparation for both operational and strategic planning as of 2011. Priority foundational projects have been examined and there has been collaboration with other Government entities such as the Central Information Technology Office (CITO) and the Fiscal Services Limited (FSL). The scope of this project was being defined and the opportunity arose when information was disseminated regarding Connect Americas 2012.

- Relationship to other past and current BDT programs/activities

Strategy

- Overall Project Objective

This project aims at establishing a robust, sustainable and affordable National Health Information Network (NHIN) in order to provide a common platform for health information access and information exchange across health facilities and paramedical services in the public and private sectors.

The relationship between primary/secondary care success and Information Technology requires an understanding of and preparation for change while driving service-level improvements across the ministry. The Wide Area Network (WAN) is a critical focal point for health services performance, IT change, and optimization (Annex 3).

Inbuilt to the conservative design is redundancy, scalability, performance, fault tolerance and scope for capacity building. There is a distinct separation of services provided on the local area network (LAN), intranet services, extranet services and internet services (see Annex 4).

The foundation by design and selection of technology will provide the ground for much logical configuration which will provide sound base for the health solutions employed (medical record, radiology, administration, etc). There are dual routers with similar capability to provide redundancy, a high end core layer switch for performance, a web filter for security and protection and a demilitarized zone (DMZ) for resource isolation.

National/Regional Strategy

This project will complement the objective of GovNet, which is an on-going project for a Government-wide networking infrastructure. GovNet also supports the intention for the design and establishment of a Caribbean Regional Network.

▪ Project Strategy

In addition to the MOH's Head Office building, the largest Hospitals and Health Centres together with Public Health Departments will be given priority for implementation. Smaller facilities will be included in later stages of the project.

As the network is built out, Healthcare software testing will be undertaken to confirm the robustness to support many simultaneous users.

Outputs

- A total of 134 networked sites/health facilities will be established by the project. This incorporates over 1000 users (Annex 6).

Indicators

- Expected results (details of measurable achievements)

Activities

- Key project activities that will be carried out to achieve results.
 - Development of Terms of Reference for Project Manager
 - Procurement of Project Manager and selection of most suitable candidate
 - Procurement of IT equipment
 - Procurement of Licences
 - Deployment of equipment, software, etc.
 - Training of trainers from each participating centre.
 - Monitoring the achievements of each deliverable
 - Evaluation and follow up of operations.

Inputs

- Contributions from the Government Agency in each implementing country (in kind): Provide a local official coordinator and support for the project from the Head Office of the MOH.
- Contribution from the implementing site (in kind): Provide IT Specialists and support staff to facilitate implementation of the project.

Risks

In Jamaica, the execution of the project will rely on the resources available at each health facility site. The lack of control over the local resources may represent a risk for the success of the project. The collaboration of the MOH, Regional Health Authorities and Health Agencies is essential to reduce any implementation risk at this level.

Sustainability

This is expected to be achieved through the collaborative actions of all IT Directors across the MOH and its agencies, as champions. As needed, the MOH will engage external parties for maintenance/servicing of equipment and this will be included in annual budget estimates.

Management

- The overall project coordinator is the IT Director of the MOH. Other IT Directors will coordinate the project implementation at the regional level and facilitate the activities accordingly.
- A Project Manager is to be recruited for the duration of the project and will monitor the progress toward completion of the activities throughout.
- The MOH's IT Director will provide periodic reports to the Health Information and Technologies Steering Committee of the MOH.

Monitoring and Evaluation

- The Project Manager will prepare a project plan, which includes a Gantt chart. At intervals, a detailed report of progress for each deliverable, obstacles and challenges, as well as any unforeseen modifications to the activities will be presented to the IT Director of the MOH. The evaluation design will be developed during the project-planning phase.

Work plan

A total of 134-networked sites will be established by end of 18 months (Annex 6). The work plan for the project is prepared at the beginning of the project and reviewed during project implementation, as required. A Gantt chart of the project implementation plan is attached as Annex 1.

Budget

- Funding, accounting and financial reporting arrangements
- Administrative cost charges
- Description of co-financing arrangements (if applicable)

Solution requirement

Item listing for each site

- 2 x routers
- 1 x 24 port Core Layer GB eth Switch with 2 port FE ports
- 1 x 16 port Distribution Layer GB eth Switch
- 1 x Web Filter hardware Firewall device (see Annex 5)
- 1 x 24 port Access Layer GB eth switch with 2 FE ports
- 1 x 14u Wall mount equipment closet
- 1 xx 1.5 KVA UPS

Additional item for MOH head office

- Citrix XenApp Solution (1000 licenses)
- 1 x 42U Network Cabinet
- 1 x Integrated 16 Port IP KVM Switch
- 1 x 3KVA UPS (rack mount)

The estimated budget is attached as Annex 2.

References

1. Stansfield, S., et al. *Case for a National Health Information System Architecture; a Missing Link to Guiding National Development and Implementation*; World Health Organization. 2008.
2. *Vision 2030 Jamaica National Development Plan*. The Planning Institute of Jamaica. 2009; Available from: [http://www.jis.gov.jm/pdf/Vision-2030-Jamaica-Draft-Integrated-National-Development-Plan\(January2009\).pdf](http://www.jis.gov.jm/pdf/Vision-2030-Jamaica-Draft-Integrated-National-Development-Plan(January2009).pdf).
3. *What is HMN? Health Metrics Network*. 2011; Available from: <http://www.who.int/healthmetrics/about/en/>.
4. *Nationwide Health Information Network (NHIN) Exchange: Architecture Overview; Draft v.0.9*. Department of Health and Human Services, USA. 2010.

Annex 2

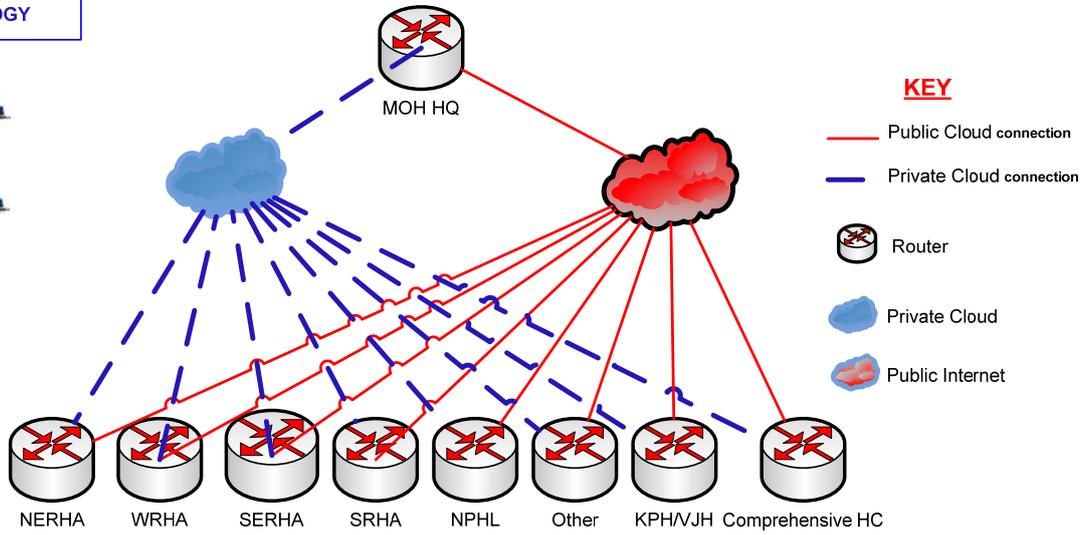
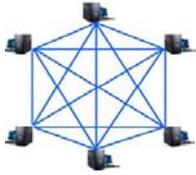
Overall Budget (ITU Format)

Sp Class Reviewed	Item	Qty	Description	Unit Cost (US)	Total
3430	Purchase IT equipment	50	Router (High end)	\$4,000.00	\$200,000.00
3430	Purchase IT equipment	218	Router (Low end)	\$1,500.00	\$327,000.00
3430	Purchase IT equipment	134	Distribution Switch	\$4,000.00	\$536,000.00
3430	Purchase IT equipment	134	Hardware Firewall (Web Filter)	\$4,000.00	\$536,000.00
3430	Purchase IT equipment	134	Core Layer Switch	\$1,325.00	\$177,550.00
3430	Purchase IT equipment	134	Access Layer switch	\$1,235.00	\$165,490.00
3430	Purchase IT equipment	134	Integrated 16 Port IP KVM Switch	\$2,600.00	\$348,400.00
3430	Purchase IT equipment	24	1.5 KVA UPS	\$600.00	\$14,400.00
3430	Purchase IT equipment	1	Network Cabinet (42u)	\$1,782.00	\$1,782.00
3430	Purchase IT equipment	134	Network Cabinet (14u) wall mounted	\$129.00	\$17,286.00
3450	Purchase computer software	1000	Citrix XenApp Lic packages	\$1,245.00	\$1,245,000.00
3161	DSA - NPPP	1	Project Manager	\$60,000.00	\$60,000.00
3800	Contingency component/Reserve		Ten (10) percent		\$362,890.80
		Total			\$3,991,798.80

Annex 3

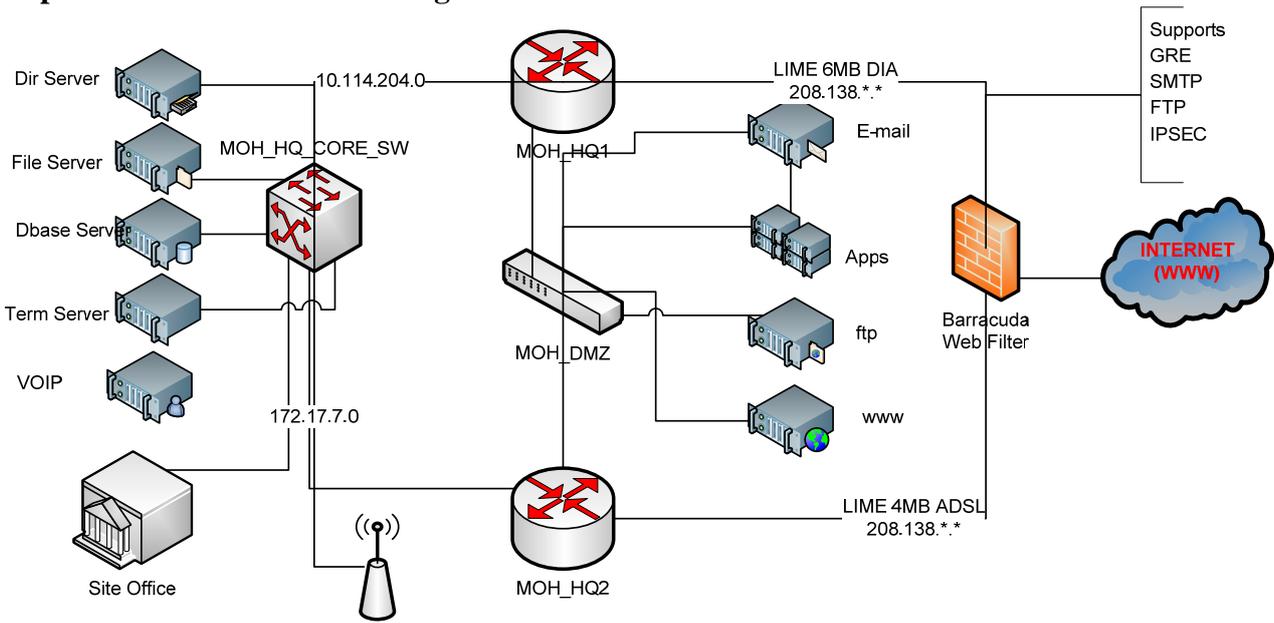
WAN Topology

MESH TOPOLOGY



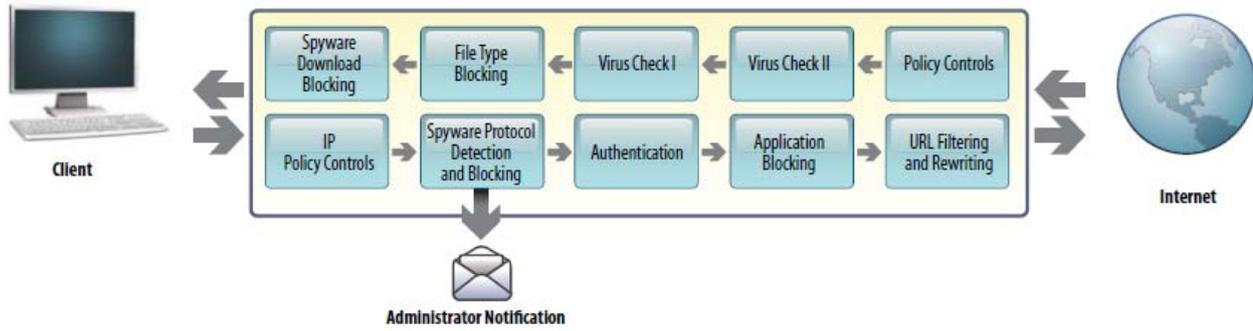
Annex 4

Proposed standard network design for all sites



Annex 5

Web Filter Firewall Device detail



Annex 6

Health Care Facilities and Other Sites for Network Infrastructure

SECONDARY CARE FACILITIES (Hospitals)			
REGION	TYPE	NAME	# of USERS
SERHA	B	Spanish Town Hospital (STH)	
	A	Kingston Public Hospital (KPH)	
	SPECIALIST	Victoria Jubilee Hospital (VJH)	
	SPECIALIST	Bustamante Hospital for Children	
	A	University Hospital of the West Indies (Private)	
	SPECIALIST	National Chest Hospital (NCH)	
	SPECIALIST	Bellevue Hospital (BVH)	
	C	Linstead Hospital	
	C	Princess Margaret Hospital	
NERHA	C	Port Antonio Hospital	
	C	Annatto Bay Hospital	
	C	Port Maria Hospital	
	B	St. Ann's Bay Hospital	
WRHA	C	Falmouth Hospital	
	A	Cornwall Regional Hospital (CRH)	
	C	Noel Holmes Hospital	
	SPECIALIST	Mo-bay Hope Hospital (Private)	
	B	Savanna-la-Mar Hospital	
SRHA	C	Black River Hospital	
	B	Mandeville Hospital	
	C	Percy Junior Hospital	
	B	May Pen Hospital	
	C	Lionel Town Hospital	

OTHER SITES			
FACILITY	REGION	# OF SITES	# of USERS
Hospitals	WRHA	5	
	NERHA	4	
	SRHA	5	
	SERHA	9	
Health Centres	WRHA	17 (type 3 and above)	120
	NERHA	10 (type 3 and above)	
	SRHA	21 (type 3 and above)	220
	SERHA	28 (type 3 and above)	
Health Departments	WRHA	4	
	NERHA	3	
	SRHA	3	60
	SERHA	3	
Parish Offices	WRHA	4	
	NERHA	3	
	SRHA	3	
	SERHA	3	
Regional Offices	WRHA	1	70
	NERHA	1	
	SRHA	1	
	SERHA	1	
NPHL/Bloodbank		1	150
MOH (head Office)		1	500
St. Joseph's Hospital		1	30
Kingston School of Nursing		1	12
Inservice Education Unit		1	12
Total		134	

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