What makes cloud computing an economical alternative information system platform?

Virtualization

- Server virtualization: the ability to make one larger computer work like a lot of smaller independent computers

- Storage virtualization: the ability to provision a big storage array of disk drives as if it were a lot of smaller disk drives.

Secure (Virtual Private) Networking

Automation: management, monitoring, deployment

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Why is cloud computing useful to caBIG adopters?

caBIG: a portfolio of highly functional, open source applications for Life Science and Clinical Research.

It is just like any other open source application set!

☐ Not perfect: applications are engineered and delivered as 'post-development' stage products

☐ Not free: adopters contribute quality improvements

☐ Some assembly is required: adopters are responsible for QA of their deployed application

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Anatomy of a typical caBIG web application deployment: Non-virtual and Virtual

One instance of caTissue running on one server supporting one biobank in one enterprise.

Many instances of caTissue running on one server supporting many biobank in many enterprises.

Your Data

Schema: caTissue

Page Parts | Images

Software

Application: caTissue

DataBase: MySQL 9

Application Server: JBOSS 4.5

Operating System: Linux CentOS 5

Server: Sun x4200 — CPU | RAM | Disk

Many copies

caTissue

caTissue

caTissue

caTissue Data | **caTissue**

DBMS | **Appl Srvr**

OS

CPU | RAM | Disk

Virtual Server

caTissue Data | **caTissue**

DBMS | **Appl Srvr**

OS

CPU | RAM | Disk

Virtual Server

Virtualization: VMWare, Xen, KVM,

Server: Sun x4200 — CPU | RAM | Disk

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Advantages of virtualizing / cloud

- **M**anage-ability: easier to make adjustments
- **E**conomy: better use of hardware resources
- **R**eliability: easier to create fail-over configurations
- **D**istribute-ability: easier to deploy systems across a network
- **R**ecover-ability: simpler and faster to recover from system failures

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The real test for the cloud: caCURE – an application for use by the public

Q: What is caCURE?

A: A web based application suite for designing healthcare data collection instruments, collecting patient/subject reported data, and analyzing results

| caCURE Form Builder | caCURE Data Collector | caHOPE Analytics |

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caCURE Builder: web based data collection instruction development, review, and approval

Form Builder: Modules, Form and Questions

caCURE Form Builder

Developed
and hosted by
HealthCare IT, Inc.

Home » Public Health » SAR Surveillance-2-Epidem...

SAR Surveillance-2-Epidemiologic ...   ADD CONTENT   ADD QUESTION   ADD TABLE QUESTION   IMPORT QUESTION

EPIDEMIOLOGIC RISK FACTORS

Occupation

Is the individual a healthcare worker?

○ Yes ○ No ○ Unknown

Please specify healthcare worker type:

☐ Physician

☐ Nurse/PA

☐ Lab

☐ Other

Please specity other healthcare work type:

Specify: [   ]

Does patient have DIRECT patient care responsibilities?

○ Yes ○ No ○ Unknown

If not a healthcare worker, please list occupation:

Please list occupation: [   ]

Edit Question

Question Text: Does patient have DIRECT patient care responsibilities?   ☑ Question Visibility

Required: ☐

Short Name: patient care responsibilities

Learn More: [text area]

Question Type: ⦿ Single Answer ◯ Multi-Answer

Category: Selected categories: 1 ▼   New

Add Skip

❌ Show this question when answer:Yes for question "Is the individual a healthcare worker?" is selected

Answers

Answer Type: RADIO ▼

Select the alignment to use: ◯ Vertical ⦿ Horizontal

Text: Yes   **Value:** 1   ❌

Text: No   **Value:** 2   ❌

Text: Unknown   **Value:** 3   ❌

Add a new answer value

caCURE Collector: web based data collection enabled to integrate with community website

CURE

My Current Questionnaire

My Submitted Questionnaires

My Notes

CDC | National Center for Environmental Health

Posts

Situation Update: Summary of Weekly FluView

FluView - Weekly Influenza Surveillance Report

Seasonal Flu: International Situation Update

No es demasiado tarde para vacunarse (It's Not Too Late To Vaccinate)

Vacuna contra la gripe recomendada para todos (Flu Vaccine Now Recommended for

Welcome to the CURE™ Demonstration Site 🖨

CURE™ is an innovative, breakthrough healthcare data collection tool that efficiently captures data and provides for data analysis in a completely evolutionary manner.

This site will allow you to explore the components of the CURE™ Suite at your own pace from the convenience of your home or office.

To view and interact with the forms you will need to register and login. If you would like to just browse the site and become familar with the CURE Suite, a login is not required. Please just click on the available menu tabs to read about the CURE™ Suite and become familiar with the site.

To obtain a free username with a password, please click on the tab "Register Now" or the link "Not a member? Click here" at the bottom of the Login block to the left. You will be taken through a short registration process.

During the registration process you will be asked to select an "Area of Interest". This will determine the content you see and the specific forms that are available for you to view and interact with. To experience multiple forms modules, you will need to register a new account for each one you wish to view.

This demonstration site is based on the open source content management system Drupal. The "Switch Theme" tab, after registration and login, will allow you to change the look and feel of the site. A similar site with your colors, logos

THIS IS PUBLIC HEALTH

CDC's Tracking Network...

Water Worry - Fluoride Levels in...

Toxic Chemicals in Seafood...

National Institute of Health | National Cancer Institute

CURE

HOME | CURE SUITE | MY FORMS | SWITCH THEME | NEWS | ABOUT HEALTHCARE IT, INC.

My Current Questionnaire

My Forms

My Submitted Questionnaires

My Account Info

My Notes

My Forms

Review a summary of your recent My Account activity and get quick access to your questionnaires.
You can only work on one questionnaire at a time. The process is very simple.

It's Easy!   **1** Fill out each part or edit each   **2** Submit when all parts are completed then go to

part if needed   the next questionnaire if available

Suggestions Appreciated

Please enter your suggestions.

Enter you suggestions here.

Topic: **Public Health**	Time to finish: 10 minutes		✔ = Finished
Part 1:	**SAR Surveillance-1--Personal details**	☐	**Add info**
Part 2:	**SAR Surveillance-2-Epidemiologic Risk Factors**	☐	**Add info**
Part 3:	**SAR Surveillance-3-Contact History**	☐	**Add info**
Part 4:	**SAR Surveillance-Travel History**	☐	**Add info**
Submit:	**Send us your finished questionnaire**		**View**

EPIDEMIOLOGIC RISK FACTORS

Occupation

* Is the individual a healthcare worker?   Need help?

◉ Yes ○ No ○ Unknown

Please specify healthcare worker type:

☐ Physician

☐ Nurse/PA

☐ Lab

☐ Other

Does patient have DIRECT patient care responsibilities?

○ Yes ○ No ○ Unknown

Contact and Travel

In the 10 days prior to symptom onset, did the patient have the following:

* Close contact in the 10 days prior to symptom onset with a confirmed SARS-CoV case or a probable SARS-CoV case?

○ Yes ○ No ○ Unknown

* Close contact with a person considered an RUI-2 or RUI-3?

○ Yes ○ No ○ Unknown

* Has patient traveled to foreign or domestic area with documented or suspected recent local transmission of SARS cases?

○ Yes ○ No ○ Unknown

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The real test for the cloud:
caCURE – an application for use by the public

Your Staff

Secured Network

caCURE
Form Builder

caCURE
Data Collector

caHOPE
Analytics

Public
Internet

X

HealthCare IT, Inc.
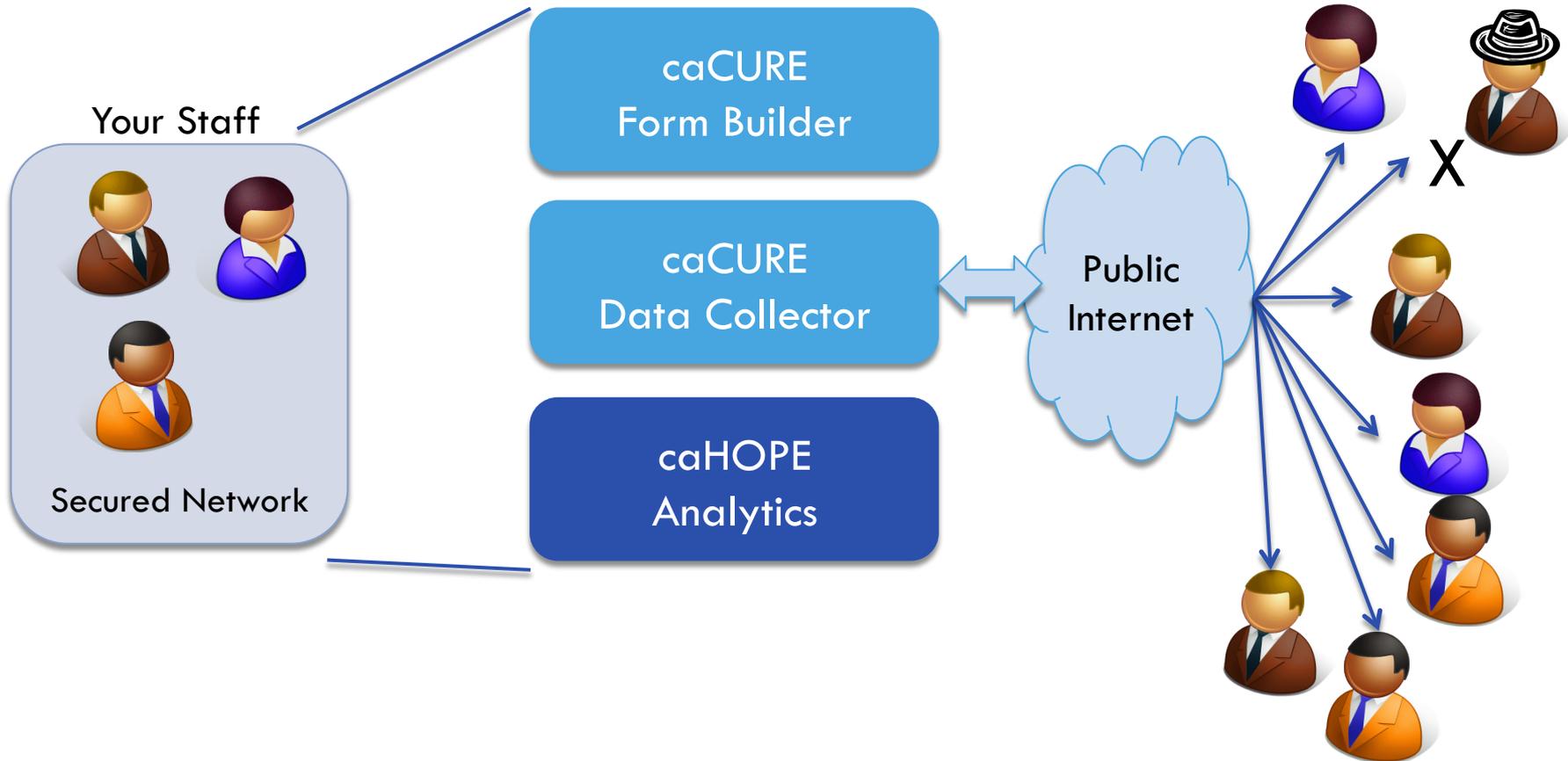
caHOPE: web based data analysis and export

caHOPE Analytics

caHOPE works with caCURE's schema-less data store
- Allows for selection of data of interest and aggregations
- Generates query for data elements
- Retrieves selected data
- Applies aggregations
- Generates working data structures for analysis
- Provides a selection of graphical and tabular reporting with filtering
- Produces extract for ex-post analysis with SAS, R, Excel, etc.

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The real test for the cloud:
caCURE – a application for use by the public

| caCURE Form Builder | caCURE Data Collector | caHOPE Analytics |

caCURE Form Builder

Form Data	Builder
DBMS	Appl Srvr
Linux	

CPU | RAM | Disk
Virtual Server

caCURE Data Collector

User Data	Content Mgmt
DBMS	Web Srvr
Linux	

RAM | Disk
CPU
Virtual Server

Form Data	Collector
DBMS	Appl Srvr
Linux	

RAM | Disk
CPU
Virtual Server

caHOPE Analytics

Meta Data	Analytics
DBMS	Appl Srvr
Linux	

CPU | RAM | Disk
Virtual Server

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caCURE Form

HOPE lytics

Form Data

Analytics

DBMS   Appl Srvr

DBMS   Web Srvr

DBMS   Appl Srvr

DBMS   Appl Srvr

Linux

Linux

Linux

Linux

CPU   RAM   Disk

RAM   Disk   CPU

RAM   Disk   CPU

CPU   RAM   Disk

Virtual Server

Virtual Server

Virtual Server

Virtual Server
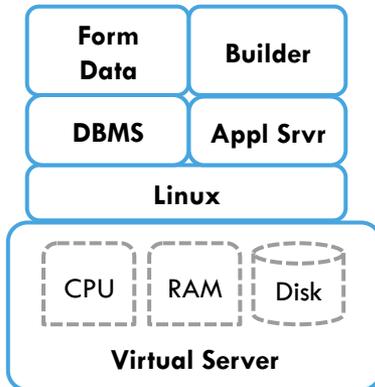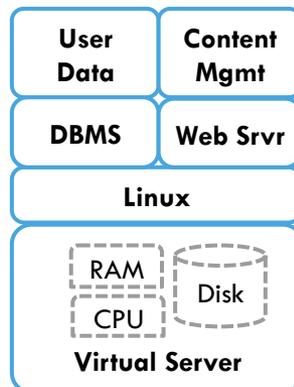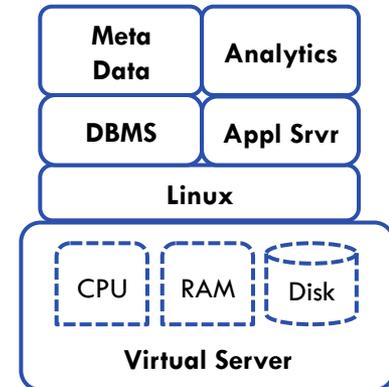
caCURE Employs:
- Four databases (MySQL, PostgreSQL, CouchDB)
- Three application servers for Java applications
- One web server for PHP Content Management System
- Nominally four servers (can be virtual)

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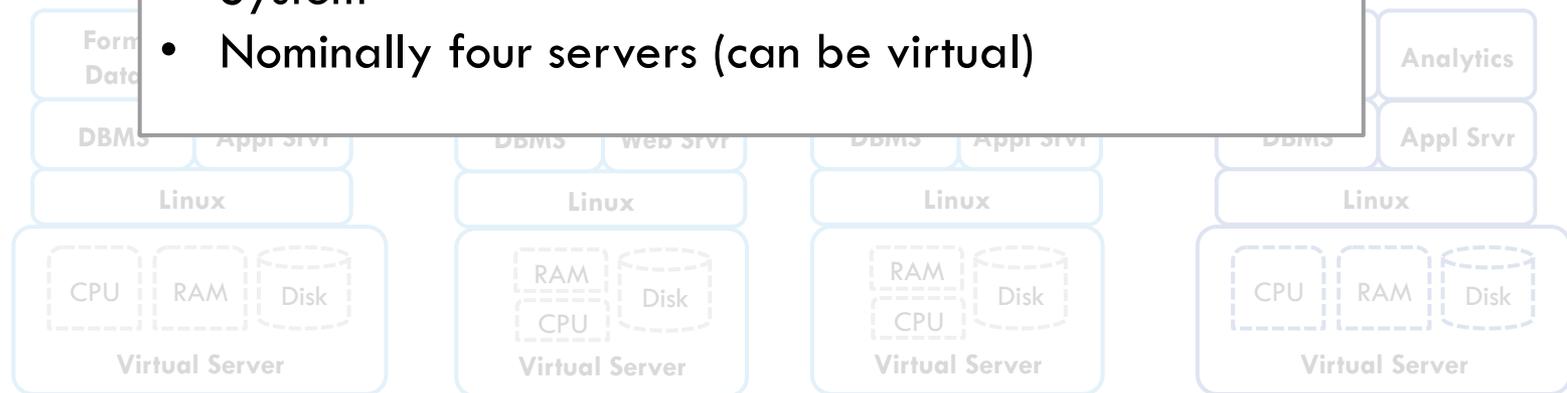
Advantages for caBIG Adopters

- ☐ Approximately zero start-up time

- ☐ Flexibility in configuration/customization options

- ☐ Lower overall operating and maintenance cost

- ☐ Faster, safer adoption of new versions and releases

- ☐ Remote management / support

- ☐ Shared implementation enablers

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Summary

caCURE is Awesome!

- Cloud based approaches can be used to make usage of caBIG applications (almost) as easy as commercial software – at lower cost

    caCURE is super cool . . . Really. Super cool!

- caBIG ESP's like HealthCare IT, Inc. can help you

    You should really consider using caCURE!

- You can also collaborate within your adopter community to leverage cloud approaches with caBIG applications

    HCIT can help you if you are interested in caCURE . . . And who wouldn't be?

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