INFORMATION TECHNOLOGY
The UNIVERSITY of OKLAHOMA

Product Support Plan: REDCap

Overview

REDCap is a research data management tool. There are two production implementations of the application. The applications are jointly managed to provide services to campus researchers.

- The Biomedical and Behavioral Methodology Core (BBMC) managed by Dr. David Bard.
- The Biostatistics, Epidemiology, and Research Design (BERD) core of Oklahoma Shared Clinical and Translational Resources (OSCTR) managed by Dr. Julie Stoner.
- Information Technology provides the technical infrastructure for the REDCap implementations.

This document describes the support model for REDCap. The primary focus of this support plan is defining the process and practice for upgrading the application and for the protection of research data through a defined backup and testing plan.

This document also defines the communications model for ensuring stakeholders are properly engaged whenever actions are taken regarding the application or its infrastructure.

REDCap Technical Description

Application Stack

The REDCap application runs on a framework built on the following:

- Web Server
  - Windows Operating System
  - Windows Internet Information System (IIS) web sever
  - PHP scripting environment
- Database Server
  - MySQL database
  - MySQL Workbench
  - phpMyAdmin
- IT Enterprise File Storage
- IT Enterprise Data Backups

Environments

There are two production and one non-production REDCap environments:

- BBMC (operated by BBMC)
- Enterprise (operated by College of Public Health)
- Development (operated by BBMC)

Infrastructure

The REDCap production implementations run on four virtual machines (VMs) operating within the Nicholson Tower Data Center on the Health Sciences Center Oklahoma City campus. The four VM design provides high availability for the application.

Note: The monthly recurring cost quote for the REDCap infrastructure, backups and professional services is attached.

Note: At this time, the REDCap VMs, while located in the NTDC, are running on the Rogers Data Center network. The REDCap VMs will be moved to the NTDC network in the near future.

REDCap Support Model

Functional Support

The REDCap team (BBMC and BERD) manages the operation of and access to the application. This includes user account management within the application and addressing functional issues with the application.

The IT Service Desk provides assistance in cases where an issue with a user's HSC account may be preventing access to REDCap.

Application Management

The REDCap team manages the update/patching process for the application. The REDCap Consortium releases applications updates on a weekly basis with each release being a fully updated application "image." All fixes and new functions are cumulatively collected in each release. Patches are not released as separate items.

The REDCap team has established a monthly update schedule.

- The monthly update uses the REDCap Standard Release version that is two releases prior to the most current release (e.g. if the current release version is X.x.9, the monthly update will apply version X.x.7).
- The update is applied to the DEVELOPMENT implementation first and it is tested for two weeks after which the update will be applied to the production instances.
- Upgrades are performed on Fridays at 9:00 PM.
- It takes approximately 15 minutes to upgrade the application.
- It takes approximately 90 minutes to validate the application after an upgrade is applied.
- An exception to the monthly update schedule is a critical security update. Releases with a critical security update will be applied as soon as possible.

Note: The REDCap team's Upgrade Protocol document, which lists the step-by-step process for performing an application upgrade, is attached.

Application Stack Management

IT manages updates to the application stack.

- Operating system patches to the VMs are applied by IT Operations during the normal monthly maintenance window.
- IT Application Services will apply patches/updates/upgrades to the PHP or MySQL layers as needed and in coordination with the REDCap Team.
- Due to the sensitive data housed within REDCap, a vulnerability scan is performed regularly to ensure the safety of the application after upgrades or other changes have been made. The scans are performed by IT Operations.

Data Protection

Due to both the sensitivity and value of the data stored in REDCap, data backups and the ability to restore REDCap from a catastrophic failure are of critical importance.

Backups

- Daily application backups are performed using VM snapshots.
  - Daily backups are retained for 15 days.
    Note: The retention time can be extended to 30 or 45 days at additional cost.
    - 15 day retention is $0.25/GB *- 30 day retention is $0.35/GB*
    - 45 day retention is $0.45/GB *- 60 day retention is $0.55/GB*
  - The snapshot copies every aspect of the REDCap application and infrastructure stacks.
  - In the event of a VM failure or the corruption of the application and its data, a new VM can be created from the snapshot.
  - The VM restore will create an instance of REDCap state at the time the snapshot was taken.
- Database transaction logs can be used to restore a database to a particular point in time.
  - Using logs, the database can be rolled back in time to a previously known stable state.
  - Transaction logs can also be used to fill the gap between when a VM snapshot was taken and an application failure.

Recovery Testing

The backup systems and recovery processes are tested annually. The IT and REDCap teams conduct recovery testing together. The test scenario (what failed and when) and test metrics (what constitutes success) are defined prior to the test.

- The REDCap team is responsible for the restoration/verification of application functionality and data validity.
- IT Application Services and IT Operations are responsible for restoration of the Application Stack and the Application Environments.
- A post-test review is conducted and documented to identify problems, process improvements or other change items. Action items will be defined and performed to mitigate problems and improve processes.

Roles Matrix

This matrix illustrates the different roles and responsibilities for supporting the REDCap applications.

	REDCap Team		Information Technology		
	BBMC	BERD	Operations	Application Services	Security
Functional Support	R, A, P	R, A, P			
Application Management	R, A, P	R, A, P			R, A
Infrastructure Support	R, A	R, A	R, P	R	R, A
Stack Management	R, A	R, A	R	R, P	R, A
Backups	R, A	R, A	P		R, A
Recovery Testing	R, A, P	R, A, P	R, A, P	R, A, P	R, A

RAP Matrix: R=Recommend A=Approve P=Perform

Support Contacts

The following individuals are stakeholders in this Support Plan.

- BBMC
  - David Bard (Primary)
  - William Beasley
  - Thomas Wilson
- BERD
  - Julie Stoner (Primary)
  - Pravina Kota
- Information Technology
  - Shad Steward, Infrastructure Services (Primary)
  - Chris Hodges, Operations
  - Tony Miller, Operations
  - Mark Ferguson, Application Services (Primary)
  - Velvadapu Rao, Application Services
  - Cliff Mack, Application Services
  - April Lee, Security

REDCap Support Plan Acceptance

These primary stakeholders have accepted this support plan on behalf of their teams.

Name	Organization	Signature	Date
David Bard	BBMC		
Julie Stoner	BERD		
Shad Steward	IT-Infrastructure Services		
Mark Ferguson	IT-Application Services	Digitally signed by Mark Ferguson Date: 2015.04.04 18:35:03 -05'00'	
April Lee	IT-Security		

Shared Services Customer Quote

Customer:	OUHSC BBMC	
Contact:	David Bard	***Redcap Environments (BBMC & Enterprise)***
Date:	4/3/15	

Service	Quantity	Tier	Monthly Price
Virtual Server Hosting	1	Virtual Machine up to 1vGig/1vCPU [@$55.00/VM]	55
Virtual Server Hosting	2	Virtual Machine up to 2vGig/1vCPU [@$70.00/VM]	$140.00
Virtual Server Hosting	1	Virtual Machine up to 3vGig/1vCPU [@$85.00/VM]	$85.00
Virtual Server Hosting	1	Virtual Machine up to 4vGig/2vCPU [@$100.00/VM]	$100.00
Virtual Server Hosting	1	Virtual Machine up to 7vGig/3vCPU [@$145.00/VM]	$145.00
Block Storage (SAN)	135	Preferred-Tier [@$0.12/GB]	$16.20
Enterprise Backup	335	15-Day Retention [@$0.25/GB]	$83.75
Professional Services	2	Maintenance and Patching by Local HSC Teams [@$125.00/hr]	$250.00
		Total (Recurring):	**$819.95**

NOTE: Pricing for both the Block Storage and Data Backup services is based on Consumption; this quote reflects maximum usage for budgetary consideration

Protocol applies to:

Development Instance: https://rcapdev.ouhsc.edu
BBMC Instance: https://bbmc.ouhsc.edu/

Upgrade file location: https://iwg.devguard.com/trac/redcap/wiki/RedcapDownloadArea

Frequency of upgrade: Monthly

Timing of upgrade: Friday evening at 9:00

Backups:

Request VM snapshots on Monday before upgrade
Verify snapshot request on Thursday before upgrade

Upgrade Version:

Use the "Standard Release" upgrade version of REDCap that is two releases prior to the most current release.

Running the upgrade:

Before Starting Upgrade:

- Notify users that REDCap will be unavailable
- Take REDCap offline using the REDCap control panel

PHP Tasks:

- New PHP code replaces the old PHP code in the web server's REDCap directory
- Navigate to the REDCap web site. It should automatically recognize that you're in the upgrade module and provide SQL code that will modify/update the database schema.
- For more details see the following instructions within download zip file.

SQL Tasks:

- During the upgrade, copy and paste the sql update code into a text document to be archived. It will be saved at the following location on the file server:
  - S:\CCAN\CCANResEval\MIECHV\RedCap\UpgradeDocumentationArchive
- Run sql from the MySQL workbench NOT from phpMyAdmin.
- All database messages are saved in a second text document, regardless if errors are present. It will be saved at the following location on the file server:
  - S:\CCAN\CCANResEval\MIECHV\RedCap\UpgradeDocumentationArchive
- If any SQL errors occur, record error message, stop upgrade, and request the VM snapshot be reverted to the saved version.
- After successful completion of the upgrade process, go through the upgrade test scripts for REDCap.

Testing:

- If there are testing errors detected with REDCap during the testing scripts, request the VM snapshot be reverted to the saved version.
- If NO testing errors are detected:
  - Put REDCap back online using the REDCap control panel

- Notify users that REDCap is available for use through the REDCap control panel.

Checklist

Instance

_____ Development: https://rcapdev.ouhsc.edu
_____ BBMC: https://bbmc.ouhsc.edu/

REDCap Upgrade Version:

_____ https://iwg.devguard.com/trac/redcap/wiki/RedcapDownloadArea

REDCap Upgrade Script

_____ Date of Upgrade
_____ Upgrade Start Time
_____ Upgrade End Time
_____ Date that the BBMC requested the VM Snapshot was scheduled
_____ Date that the BBMC verified the VM Snapshot was scheduled

_____ **PHP Version**

_____ **MySQL Version**

REDCap SQL Upgrade Code (copy the code and paste below):

REDCap SQL Error Log (copy and paste any SQL error messages that occur during the upgrade process):

REDCap Testing Scripts:

_____ Baseline Test Script
_____ Basic Functionality Script
_____ Control Panel System Configuration Script
_____ User Acceptance Testing Script