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***GRID PROOF OF CONCEPT PHASE II  
CENTERS OF EXCELLENCE ACTIVITIES  
PROJECT CHARTER***

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*Version 1.1  
June 9, 2008*

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## VERSION HISTORY

Version #	Implemented By	Revision Date	Reason	Approved By	Approval Date
0.1	Brian Lee	04/25/08	Initial draft	Crystal Watson	04/28/08
0.2	Brian Lee	05/12/08	Input by Tom Savel, Crystal Watson and Ken Hall	Crystal Watson	05/14/08
0.3	Ken Hall	05/21/08	Input by Tom Savel, Crystal Watson, Brian Lee and Ken Hall	Crystal Watson	05/23/08
1.0	Ken Hall and Crystal Watson	05/26/08	Final Draft Edits	Crystal Watson	05/27/08
1.1	Brian Lee	06/09/06	Edits for Harvard ESP program		

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## **1 INTRODUCTION**

### **1.1 PURPOSE OF PROJECT CHARTER**

The GRID Proof of Concept Phase II Project Charter documents and tracks the necessary information required by decision maker(s) to approve the project for funding.

The intended audience of the GRID Proof of Concept Phase II Project Charter is the project sponsor and senior leadership.

## **2 PROJECT AND PRODUCT OVERVIEW**

This charter describes a project that will expand the grid research activities to interact with the National Center for Public Health Informatics (NCPHI) Centers of Excellence (CoE) to connect to the public health research grid and demonstrate limited capability during the PHIN 2008 Conference.

In January, 2008 the CoEs met with NCPHI leadership and agreed to participate with the NCPHI grid research activities. Each of the CoEs will leverage its existing public health informatics activities to connect to the public health research grid, perform a technical demonstration and describe how the demonstration will lead to public health impact.

This project will take place over a short period of time- approximately three months- and involve the close collaboration among the following organizations: CDC (PMO and Grid Team); BearingPoint; NCPHI Centers of Excellence- Columbia University, Johns Hopkins University Applied Physics Laboratory, University of Utah, University of Washington, and Harvard University. This project will show the extent of collaboration possible through the three month period. Due to this projects limited time frame, it is unlikely that activities will have a direct impact on public health activities; however, its findings will serve to illustrate and plan future activities for how the CoEs are able to use the public health research grid public to further the public health mission.

The majority of activities will be accomplished at the CoE, by CoE resources. This project will facilitate and coordinate the CoEs exposing existing functionality on the grid and to develop extended functionality with grid technologies. NCPHI resources will serve to coordinate, provide infrastructure support and develop connection code to facilitate demonstration.

This project will use the NCPHI computer research lab. It will employ the Division of Shared Services to provide technical and infrastructure services for the lab. The NCPHI Office of the Director (OD) Project Management Office (PMO) will provide oversight, governance and PM services for the project. The Grid Lab Team will provide support on grid infrastructure. The Grid Development Team will provide software development to support CoE grid-enabled data and web services.

This proof of concept will inform and guide a subsequent proof of concept to continue the involvement of the CoEs beyond the PHIN Conference. Based on the findings of this project, additional functions and features will be identified. These additional functions and features will be further explored, expanded and developed in the subsequent proof of concept project.

### **3 JUSTIFICATION**

#### **3.1 BUSINESS NEED**

NCPHI is beginning a transition to a collaborative organization connecting with its public health partners to exchange federated data. Each program will assess how best to move their systems from traditional point-to-point, siloed to securely connected, collaborative systems functioning on a public health grid.

This transition raises many questions, such as how to securely exchange data, how many resources are required to connect and maintain grid connections, and what are the capabilities available by sharing resources. This project seeks to inform the answer to these questions and support NCPHI efforts to transition to an open, collaborative public health grid.

#### **3.2 PUBLIC HEALTH AND BUSINESS IMPACT**

The public health impact will be to inform, but not define, new tools and technology that can be leveraged public health function. Additionally, the tools and technology used by the CoEs can also be later leveraged for additional public health informatics activities such as: collaboration, communication, surveillance, resource sharing and distributed computing.

### **4 SCOPE**

#### **4.1 OBJECTIVES**

Grid technologies are an open-source, collaborative framework (based primarily but not exclusively on Globus software) for distributed computing on a national and world-wide scale. In other words, grid provides a software infrastructure for federating databases and services utilizing a service-oriented architecture (SOA). The Grid is “distinguished from conventional distributing computing by its focus on large-scale resource sharing, innovative applications, and in some cases, high performance orientation”.<sup>1</sup>

The current state of software infrastructure within public health is fragmented. Applications and databases are organized independently, separately and created locally. The majority of public health systems do not interoperate. Additionally, from a technical and sociological perspective, public health is an Internet- and global-scale problem; epidemiological data, for example, captured in Africa needs to be shared and analyzed at CDC in Atlanta, Harvard University in Boston and at the World Health Organization (WHO) in Geneva. The Internet certainly provides a network backbone for supporting public health; however, the requirements of public health, and healthcare, in general, demand the discovery and testing of a durable framework that can operate across this world-wide network—one that can deliver robust security, fault-tolerance, redundancy, interoperability and remain economically sustainable.

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<sup>1</sup> I. Foster, C. Kesselman, J.M, Nick, and S. Tuecke,. Grid services for distributed systems integration. IEEE Computer, 35(6), 2002.

The following table outlines how some of the public health informatics requirements align and mesh with the framework and infrastructure available through grid technologies.<sup>2</sup>

Grid Framework	[Not comprehensive] Public Health Informatics Requirements
Open-source	Sustainable, distributed economic model for software infrastructure development
Collaborative	Cross-engagement of public health, healthcare, regional health information organizations, laboratories, world health organizations, etc.—nationally and internationally
Distributed Computing	Leverage legacy software infrastructure and utilize cumulative processing power of dispersed computational, service and data resources within public health
Internet-scale Middleware	Population health is aligned locally, nationally and globally
Federated Databases	Sensitive public health and healthcare data requires local curation which may be accessed through a common, secure, federated infrastructure
Service-oriented Architecture	Common algorithms, analysis, and visualization services should be accessible throughout all organizations touching public health

By evaluating how NCPHI CoEs can use Globus technologies and demonstrate this use for the PHIN Conference 2008, this project will inform NCPHI to move it closer to its stated target architecture of federated data spread across CDC programs and state/local/territorial public health partners.

The following table details the five CoEs, their contacts and the objectives to be accomplished by this project. More detailed objectives are described below the table.

Center of Excellence	Public Health Contact	Technology Contact	Activities
Columbia University	Farzad Mostashari	Albert Lai	Natural Language Processing Service
Johns Hopkins University Applied Physics Laboratory	Joe Lombardo	Wayne Loschen	Web Services Data Services

<sup>2</sup> Many of these public health requirements and framework features overlap and build upon each another.

University of Utah	Matt Samore	Ronald Price	Data Services
University of Washington	William Lober	Svend Sorenson	Web Services Data Services
Harvard University	Kenneth Mandl Ross Lazarus	Ben Reis Andrew McMurry	Natural Language Processing Service SPIN Electronic Support for Public Health (ESP)

The specific objectives of the GRID Proof of Concept Phase II are as follows:

- Measure resources necessary for delivering existing public health informatics resources onto the public health research grid
- Columbia University:
  - Providing their Natural Language Processor as a service available on the research grid
- Johns Hopkins University Applied Physics Laboratory:
  - Develop a synthetic medical records service and make available on the research grid. This service will create needed data to support development and evaluation.
  - Develop a medical records analytics service and make available on the research grid.
  - Develop an information sharing service and make available on the research grid.
- University of Utah:
  - Provide analytic service for processing vital records data.
  - Provide analytic service for processing environmental data.
  - Develop data services for sharing vital records data.
  - Develop data services for sharing environmental data.
- University of Washington:
  - Provide functionality from their existing surveillance toolkit (Shoki) as a service available on the research grid.
  - Develop data sharing service and make available on the research grid.
- Harvard University:
  - Providing their Natural Language Processor as a service available on the research grid.
  - Identify partners to participate in future proof of concept project to test interoperability of SPIN grid with the public health research grid.
  - Demonstrating the feasibility of grid technology used with syndromic surveillance data generated from ESP program. Further description for

this item is available in the Leveraging Grid Technology to Enhance Local Biosurveillance Capacity Project Charter.

## 4.2 HIGH-LEVEL REQUIREMENTS

The following table presents the requirements that the project's product, service or result must meet in order for the project objectives to be satisfied.

Req. #	Requirement Description
01	Provide infrastructure support for installing node with each CoE.
02	Provide infrastructure support for testing connectivity with each CoE node.
03	Develop test components to invoke CoE developed web services.
04	Develop support web services as needed to support CoE developed web services.
05	Facilitate meetings and conference calls to support CoE collaboration and communication.
06	Develop and deliver results presentation to NCPHI leadership.
07	Provide development support to demonstrate CoE developed grid functionality.
08	Record lessons learned from CoE efforts.

## 4.3 MAJOR DELIVERABLES/MILESTONES

Major Deliverable	Deliverable Description
Project Kick-off	Meet with Project Sponsors to confirm the: <ul style="list-style-type: none"> <li>• Project Scope</li> <li>• Project Approach</li> <li>• Project Deliverables</li> </ul>
Install node with each CoE	Install and test public health research grid at each of five CoE.
Expose & Develop services	Expose and call data services and web services running on CoE node. Develop services as necessary to support demonstration of CoE functionality.
Proof-of-Concept Assessment	Level of effort and success rate for meeting above PoC requirements and objectives.
NCPHI Leadership Presentation	Present results to NCPHI Leadership prior to PHIN Conference Presentation.
PHIN Conference Presentation	Display results from CoE activities to PHIN Conference 2008.
Proof-of-Concept results documented	Results intended for use for presentation to NCPHI, Centers of Excellence, Advanced Practice Centers, other partners and submission of paper(s) to peer-reviewed journals

## 5 DURATION

### 5.1 DURATION

The project has a defined end date of August 31<sup>st</sup>, 2008.

The NCPHI Leadership Presentation will be delivered on August 15<sup>th</sup>, 2008.

The PHIN Conference Presentation will be delivered between August 24<sup>th</sup> and August 28<sup>th</sup>, 2008.

## 5.2 RESOURCES

**Project Core Team:** Current members of the NCPHI OD, NCPHI PMO and an EA Technical Resource will be used to staff this project.

**NCPHI Lab Team:** The lab team will provide technical oversight, strategic direction, infrastructure support and software development.

**External Partners:** Resources from Columbia University, Johns Hopkins Applied Physics Laboratory, University of Utah, University of Washington, Harvard University.

## 6 ASSUMPTIONS, CONSTRAINTS AND RISKS

### 6.1 ASSUMPTIONS

This section identifies the statements believed to be true and from which a conclusion was drawn to define this project charter.

1. Resources and end date are fixed.
2. System owners and project teams will participate and comply with requests necessary for completion of this project.
3. This proof-of-concept project represents research. The knowledge and experience generated by this project should inform other projects leading to potential future technical architectures for NCPHI.

### 6.2 CONSTRAINTS

This section identifies any limitation that must be taken into consideration prior to the initiation of the project.

1. There are time constraints that will limit the amount and depth of analysis than can be performed.
2. There are a limited number of resources available to complete the project.

### 6.3 RISKS

Risk	Mitigation
Unfunded initiative with limited timeframe and resources	Some high-level objectives are noted as “time permitting”
Lack of formal buy-in from internal stakeholders	Sponsorship from NCPHI Director and a Project Charter authorizing the project.
Use of external partners	Assessment nature of PoC does not require hard deadlines for external partners
No defined public health impact for each CoE	Identify applicability to public health activities for future proof of concept projects
Lab environment in development versus steady	PoC projects given top priority for minimal but dedicated lab resources

Risk	Mitigation
state	

## 7 PROJECT ORGANIZATION

### 7.1 ROLES AND RESPONSIBILITIES

This section describes the key roles supporting the project.

Name & Organization	Project Role	Project Responsibilities
Dr. Leslie Lenert NCPHI OD	Project Sponsor	Person responsible for acting as the project's champion and providing direction and support to the team. In the context of this document, this person approves the request for funding, approves the project scope represented in this document, and sets the priority of the project relative to other projects in his/her area of responsibility.
Tom Savel Crystal Watson NCPHI OD	Project Officers	A program representative responsible for coordinating with acquisition officials on projects for which contract support is contemplated. This representative is responsible for technical monitoring and evaluation of the contractor's performance after award.
Ken Hall BearingPoint	Technical Steward	The Technical Stewards are responsible for providing technical direction to the project.
PMO/EA Team  NCPHI  BearingPoint	Project Team	Performs the day to day activities of the projects.  PMO Team <ul style="list-style-type: none"> <li>• Crystal Watson &amp; TBD PMO Resource</li> </ul> EA Technical Resource <ul style="list-style-type: none"> <li>• Brian Lee</li> </ul> Grid Lab Team <ul style="list-style-type: none"> <li>• Dan Washington</li> <li>• Peter White</li> </ul> <p>* Other members of the Project Team may include NCPHI staff and contractors who</p>

Name & Organization	Project Role	Project Responsibilities
		may serve in a Subject Matter Expert role.
External Partners	Project Team	Provide resources to connect CoE resources to grid expose services and test functionality. <ul style="list-style-type: none"> <li>• Columbia University</li> <li>• Johns Hopkins University Applied Physics Laboratory</li> <li>• University of Utah</li> <li>• University of Washington</li> <li>• Harvard University</li> </ul>

## 8 PROJECT CHARTER APPROVAL

The undersigned acknowledge they have reviewed the **Project Charter** and authorize and fund the GRID Proof of Concept Phase II project. Changes to this **Project Charter** will be coordinated with and approved by the undersigned or their designated representatives.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Print Name: Dr. Leslie Lenert  
 Title: NCPHI Director  
 Role: Executive Sponsor

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Print Name: Tom Savel  
 Title: NCPHI Director of Science  
 Role: Project Officer

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Print Name: Crystal Watson  
 Title: NCPHI PMO Director  
 Role: Project Officer

## APPENDIX A: REFERENCES

Research Lab Requirements (reusing resources allocated for previous Grid PoC projects)

Server Instances	1
Server OS Installations	Open SUSE (latest version)
Server RAM	2 – 4 GB
Processors	Dual core (2 GHz per core)
Workstation locations	3
Project End-date	August 31, 2008
Internet Access	DSL
3 <sup>rd</sup> Party Software	None required
Access Mode	Root access

## APPENDIX B: TECHNICAL ARCHITECTURE

