The need for robust language processing capabilities across academic disciplines, education, and industry is without question of vital importance to national security, infrastructure development, and the competitiveness of American business. However, at this time a robust, interoperable software infrastructure to support natural language processing (NLP) research and development does not exist. To fill this gap, this project establishes an international collaborative effort involving key players from the U.S., Europe, Asia, and Australia to develop an open, web-based infrastructure through which massive and distributed language resources can be easily accessed, in whole or in part, and within which tailored language services can be efficiently composed, disseminated and consumed by researchers, developers, and students.

The goal of this project is to build on the foundation laid in SILT and other projects as well as the momentum toward a comprehensive network of web services and resources within the NLP community. To this end, there are four specific aims for the proposed research: (1) Design, develop and promote a service-oriented architecture for NLP development that defines atomic and composite web services for NLP, along with support for service discovery, testing and reuse; (2) Construct a Language Application Grid (LAPPS Grid) based on Service Grid Software developed at NICT and Kyoto University in Japan; (3) Provide an open advancement (OA) framework for component- and application-based evaluation that enables rapid identification of frequent error categories within modules and documents which module(s) and error type(s) have the greatest impact on overall performance, thus contributing to more effective investment of resources in both research and application assembly; (4) Actively promote adoption, use, and community involvement with the LAPPS Grid.

The LAPPS Grid will dramatically impact resource and software sustainability, manageability, usability and composability/interoperability, and substantially eliminate redundancy of effort now common the in field, by providing the base for sustained and distributed community development in the years to come. As such, it will provide an unparalleled platform to support a wide range of activities and disciplines in higher- and secondary-education, including the humanities as well as the natural and social sciences.

**Intellectual Merits** This work proposes a novel integration of existing resources as well as an environment within which new resources and applications can be developed, tested, and used in ways that were previously difficult or impossible. Given recent advances in technology and efforts toward interoperability within the language processing community, the situation is ripe for a transformative leap in the way tools and resources for language processing are created and deployed that will result in the establishment of a global, web-based infrastructure of language resources and processing capabilities. This project lays the basis for this network and aims to involve the language processing research and development community from the outset to create a global distributed effort over the years to come.

**Broader Impacts** By providing access to cloud-based services and support for locally-run services and lowering the barriers to entry resulting from licensing, redistribution, and intellectual property concerns, the LAPPS Grid will lead to the existence of a massive global network of language data and processing capabilities that can be used by scientists and engineers from diverse disciplines. Because the Grid will provide packaged components that require no expertise in language processing to apply, research in sociology, psychology, economics, education, linguistics, digital media, and the humanities will be impacted by the ability to easily manipulate and process diverse language data sources in multiple languages. LAPPS will also significantly extend the already demonstrated impact of the Language Grid on multi-lingual, multi-cultural interactions and collaborations.