A.2.i.b. Supporting Participating LEAs

The NC Department of Public Instruction (NCDPI) maintains an extensive array of communications and support mechanisms that will be called upon to help LEAs to implement successfully the State's RttT plans. In addition, NC will develop a centralized PK-12 Education Technology Cloud infrastructure to provide access for all LEAs to the resources and tools necessary to support the reform agenda. NCDPI will build on existing State Board and Department strategic planning and budget allotment processes to plan jointly with LEAs and then hold them accountable for progress and performance on RttT initiatives.

NCDPI Statewide System of Support

As noted above, NCDPI has a long history of providing foundational support to all NC LEAs. In 2008, NCDPI redesigned its framework for providing comprehensive support services to better coordinate the intensive help needed in the lowest-capacity, lowest-achieving schools and districts. The resultant Statewide System of Support employs a regional model that works to coordinate all NCDPI services provided to a given district, school, region, or "affinity group" (such as large urban districts or high-poverty rural districts). NCDPI staff with expertise in major program areas (such as testing and accountability, exceptional children's services, curriculum and instruction, technology, school planning, and instructional management) operate in the field, helping school districts and schools assess their needs, identify and implement relevant evidence-based effective practices, and monitor effectiveness. These program areas coordinate their efforts through a monthly central "agency roundtable," in which staff share plans, lessons learned, and input and requests from the field. In addition the NCDPI provides information to all LEAs through established, centralized communication vehicles.

Statewide Technology Infrastructure and Resources: The K-12 Education Technology Cloud

Effective use of information and communications technologies is central to the NC plan to improve PK-12 education. These technologies are being used to enhance classroom teaching and learning; extend the educational resources available to every student and teacher; provide extended virtual learning opportunities for students, teachers, and administrators; improve the use of data in decision making at all levels; increase communications within the school community; and help prepare students for the technological world in which they live.

This commitment to effective educational use of technology is reflected in the NC School Connectivity Initiative, which has connected all of our public school districts to the NC Research and Education Network in order to provide reliable, high-bandwidth connectivity. Other technology initiatives include a series of IMPACT projects funded by Title IID that have created technology-enhanced classrooms and provided related professional development throughout NC, with documented, positive results on student achievement (Osborne *et al*., 2006). More recently, the NC Learning Technology Initiative has supported, with public and private funding, LEAs in planning and implementing "one-to-one" initiatives in which every teacher and student is provided with a computer or handheld networked device, wireless access is provided throughout the schools, and teachers receive content-based professional development on using technology to enhance learning. Currently, 46 of the 115 LEAs in NC are planning, piloting, or implementing 1:1 initiatives.
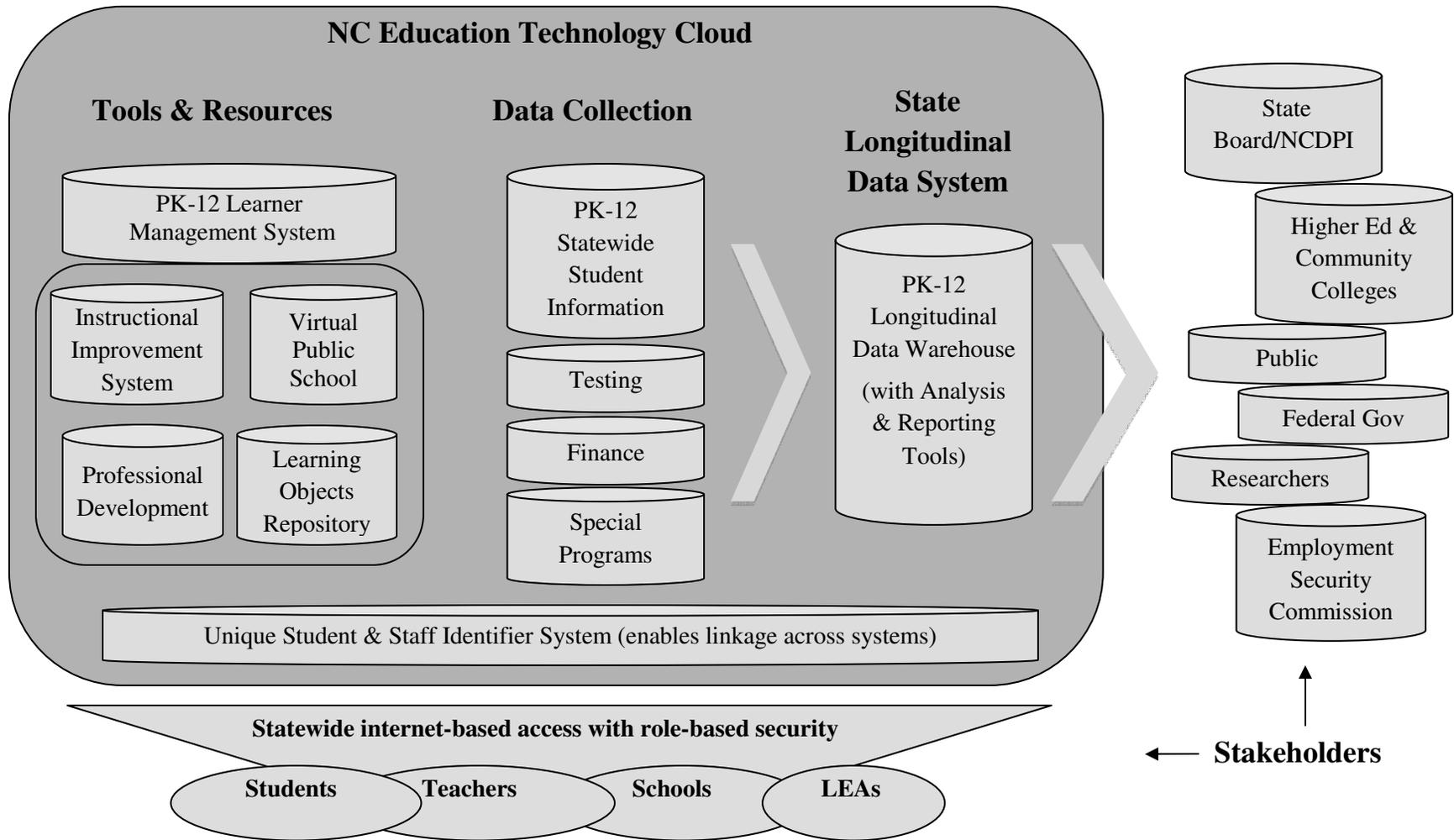
While a robust and reliable technology infrastructure is essential for 21st century schools, the current system of district-based acquisition and support of the full technology infrastructure is neither cost-efficient nor sustainable in small LEAs with limited resources. The alternative, frequently called a "cloud computing" approach, involves moving technology resources to centralized servers and then rapidly delivering what is needed, when it is needed, to individual devices, ranging from desktop computers to smart phones. This state-of-the-art approach is used by technology leaders such as Amazon, Google, and IBM to provide Internet-based services and software.

To directly support the RttT initiatives statewide, we propose to develop the NC PK-12 Education Technology Cloud (Education Cloud) to provide a highly reliable, cost-effective, server-based infrastructure that will support PK-12 education statewide. This development will involve transitioning statewide from individual, LEA-hosted server infrastructures to this centralized, cloud-hosted infrastructure as a service. The primary objective of the NC Education Cloud is to provide a world-class technology infrastructure as a foundational component of the NC education enterprise, along with:

- Reduced overall cost, with a significant savings once the transition to the Education Cloud is complete;

- Decreased technical support staffing requirements at the LEA level;

- Equity of access to computing and storage resources;

- Efficient scaling according to aggregate NC PK-12 usage requirements;

- Consistently high availability, reliability, and performance;

- A common infrastructure platform to support emerging data systems;

- Ability to provide statewide access to core technology applications;

- Improved security; and

- Sustainable and predictable operational cost.

Figure 2 on the following page illustrates how the proposed NC PK-12 Education Technology Cloud brings together key statewide information technology components that are discussed in other sections of this proposal.

NC Education Technology Cloud

Tools & Resources

PK-12 Learner Management System

Instructional Improvement System

Virtual Public School

Professional Development

Learning Objects Repository

Data Collection

PK-12 Statewide Student Information

Testing

Finance

Special Programs

State Longitudinal Data System

PK-12 Longitudinal Data Warehouse (with Analysis & Reporting Tools)

State Board/NCDPI

Higher Ed & Community Colleges

Public

Federal Gov

Researchers

Employment Security Commission

Unique Student & Staff Identifier System (enables linkage across systems)

Statewide internet-based access with role-based security

Students   Teachers   Schools   LEAs

Stakeholders

Figure 2: NC Education Technology Cloud

The K-12 Education Cloud strategy provides for coordinated procurement and support of server infrastructure and software platforms that support teaching and learning in NC public schools. NC is uniquely positioned to deploy Cloud services because the State has invested nearly $60 million in reliable, high-bandwidth connectivity to all NC schools since 2006. Once the transition to a K-12 Education Cloud is completed, during the RttT grant period, we expect that it will save districts an aggregate of $25 million per year and save NCDPI $5 million per year over current technology infrastructure costs, thereby providing sustainability of the technology infrastructure at a total cost savings.

The NC PK-12 Education Cloud will be used to deliver statewide access to the major digital resources and tools necessary to support RttT initiatives. For example, it will provide students and teachers with highly available and universally accessible Learning Management Systems offering the following functionality:

- Online courses for students and educators, and materials to support the integration of online resources into traditional courses;
- Web 2.0 tools, such as blogs, wikis, and social networking tools, in protected spaces appropriate for educational uses by students and teachers;
- Libraries of digital learning objects, such as educational videos that can be streamed into classrooms; and
- Online spaces for students and teachers to post and share their work, from text to video, and to engage in collaborative work.

Providing a common set of online resources and tools will ensure that every student and teacher has equitable access to technology resources. A focused set of digital tools and resources used across NC also will facilitate technical assistance; professional development; and the sharing of resources across classrooms, schools, and districts. More information about the plan for implementing these technology components in support of the RttT Initiatives is provided in the NC Education Cloud Feasibility Report located in Appendix 8; information about professional development and coaching for educators to help them access and utilize this and other technology tools is included in Section D5. The combination of the prior School Connectivity Initiative and the proposed NC PK-12 Education Cloud will provide an essential foundation for the each of the four main proposed RttT initiatives, as follows: