# Processing and Storage Middleware Support for Capture and Access Applications

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## INTRODUCTION

Capture and access (C&A) applications facilitate the capture of and the access to live experiences and are a main theme in the ubiquitous computing research area. Despite their common needs and architectural similarities, there is a lack of middleware support for building capture and access applications. The literature reports on efforts towards providing those applications with network abstractions that make communication between applications transparent [1][2].

Leveraging off that work, we developed a set of component-based infrastructures and services for providing functionality and storage abstractions to C&A Applications.

## INCA

Truong and Abowd reports on the INCA infrastructure — Infrastructure for Capture and Access Applications — that provides architectural support for building C&A applications through a set of key design concerns [2]. The basic entities are the capture and access modules, which behave like producers and consumers in a peer-to-peer approach. INCA has a *Registry* entity that controls the presence of all capture and access modules in the system. Capture modules publish the kind of information they provide, while access modules subscribe for the kind of information they want to receive. When publish and subscribe attributes match, capture and access modules have the communication flow between them enabled.

## xINCA

Besides architectural aspects, a large number of C&A applications present recurrent functionalities, e.g. whiteboard, chat, audio, video and web logging capture and access. These functionalities can appear in any combination and suggest a component-based approach. With this in mind, we developed xINCA (Extended Infrastructure for Capture and Access Applications) as a layer on top of INCA, making use of its modules and abstractions.

Using xINCA, a new C&A application is built by means of the combination of the software components demanded. Currently, xINCA comprises components for whiteboard, chat, audio, video and web logging capture and access. Those components communicate using a session identifier. A *session* represents a period of interaction between components. The xINCA components implement instances of capture, access or both INCA modules. These modules are registered under a session identifier at runtime in an INCA's *Registry*, which can be local or remote. Modules of components registered under the same session identifier are able to exchange data.

## StRES

The StRES (Storing, Retrieving and Extending Service) is a storage service based on XML documents. It has a *Transducer* object that instantiates xINCA access components for each functionality (xINCA capture component) present in the application and provides automatic storage of the corresponding generated documents. Each of our components has a specific data schema which is used to structure the information produced. Using a data binding mechanism, we derive Java classes for the elements and attributes present in each schema, allowing both server and client portions of applications to define objects that manipulate and exchange the captured information.

## ACKNOWLEDGMENTS

## REFERENCES

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[2] Truong, K. and Abowd, G. *Enabling the generation, preservation & use of records and memories of everyday life*. Technical report GATECH GIT-GVU-02-02, GVU Center, Georgia Institute of Technology, 2002.