1 Architecture

K2 smartforms Architecture

- Design Time
- Runtime

K2 smartforms is built on the K2 Platform and uses K2 components such as the Host Server, SmartObjects and Workflows in various ways. The easiest way to understand how SmartForms fits into the K2 architecture is to consider how it is used, both at design time and at runtime. Designers and Developers use the K2 Designer and all of its components to build SmartObjects, Views, Forms and Workflows.

Once the items have been built, the developer will publish these to a K2 server. The Form definitions are saved into the database using the SmartForms Management API and sent to the SmartForms Client API in runtime when a user is interacting with the item. It is important to note that both SmartForms and K2 Workflows use SmartObjects as the main mechanism to interact with Data Providers. This makes development simpler and faster as duplicate records are not necessary for SmartForms and K2 Workflows. At runtime, end users can interact with Workflows and SmartObjects from various supported browsers. Please note that although there may be a separate server that hosts the IIS web site that renders the SmartForms, the K2 server plays an integral part in making SmartForms work. The diagram below illustrates the architecture of the different components of K2 smartforms.

SmartForms can only be designed in the web-based K2 Designer tool, while SmartObjects and Workflows can be created in the web-based K2 Designer tool as well as the other existing K2 design tools like K2 Studio, K2 Designer for Visual Studio.

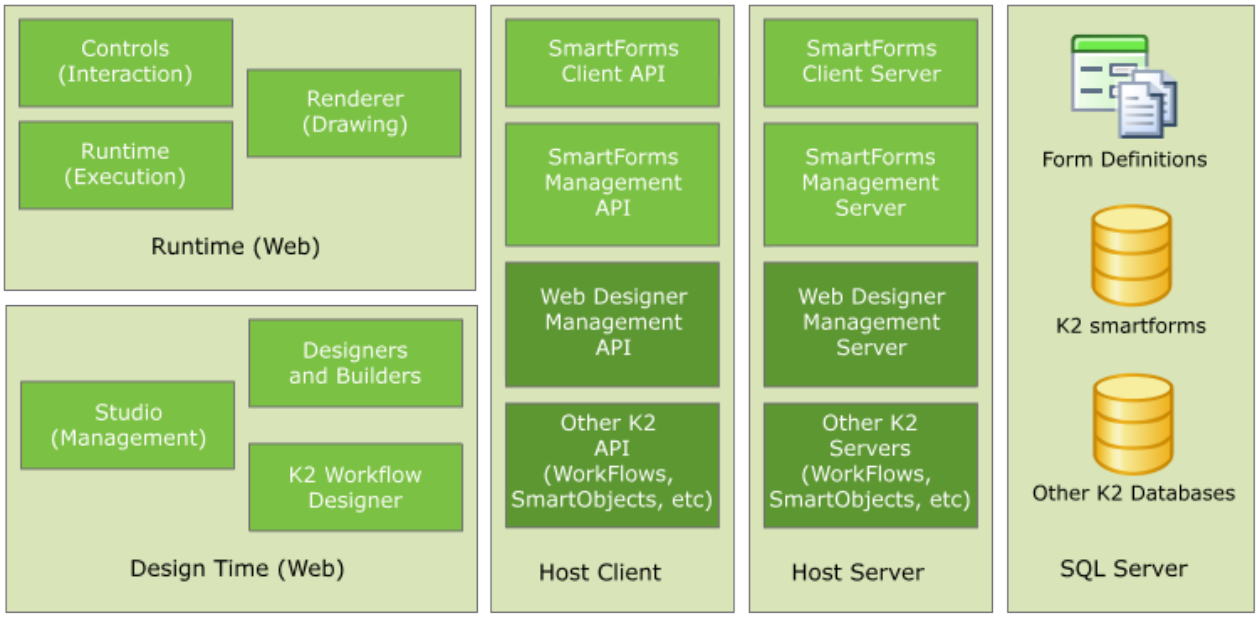

Fig. 1. SmartForms Architecture

Design Time

Form Definitions	Contain information relating to Details, Rules, Controls, Layout, Expressions, Validation Formatting
SmartForms Client Server	Send runtime Form Definition to SmartForms Client API
SmartForms Client API	Exposes the runtime Form Definition through the K2 web application. Custom applications can also be used such as mobile and Silverlight applications
K2 smartforms database	Stores View and Form Definitions
SmartForms Management Server	• CheckIn, CheckOut, UndoCheckOut, Delete • Lists the items that are registered in a component • Deploy View/Form definitions to Management Server • Retrieve information regarding View/Form definitions from Management Server
SmartForms Management API	Supports management and designer functions
SmartObject Designer	• Gets the definition of the SmartObject from the SmartObject Server • Manages the design of the SmartObject • Deploy back to Management API

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View Designer	• Gets the definition from the SmartForms Management Server • Manages the design of the View • Deploy back to Management API
Form Designer	• Gets the definition from the SmartForms Management Server • Manages the design of the Form • Deploy back to Management API
Rule Designer	Runs inside the View and Form Designers, gets definition in context of Designer being used
Studio Management	• Manages the properties of all the objects as it is used inside the Designers • Manages the Category tree of the K2 Designer
Web Designer Management Server	• Manages the Web Designer workflows • Workflow information saved in the K2 Web Designer schema
K2 Workflow Designer	• Surfaced in K2 Designer • Uses K2 smartforms components • K2 SmartObjects created in K2 Studio and K2 Designer for Visual Studio can be surfaced in the K2 Designer and enabled for use in the K2 Workflow Designer • Saves workflows to the K2 Web Designer database

RunTime

Renderer	Renders runtime Form definition to HTML
Runtime	Controller XML that contains the runtime Java script and is available for execution on the Form
Controls	Each control knows how to draw itself. The runtime control HTML is based on the control and will differ per control as each control has different properties

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1.1 K2 Server

K2 Server with SmartForms

The K2 platform is built on Microsoft technologies, such as Windows and the .NET framework, and has a modular architecture that allows many parts of the platform to be extended, replaced and configured to run on different servers for greater flexibility and scalability. It is for this reason that there was no need to change the current K2 Server Architecture to incorporate K2 smartforms.

The diagram below depicts the current K2 Server Architecture.

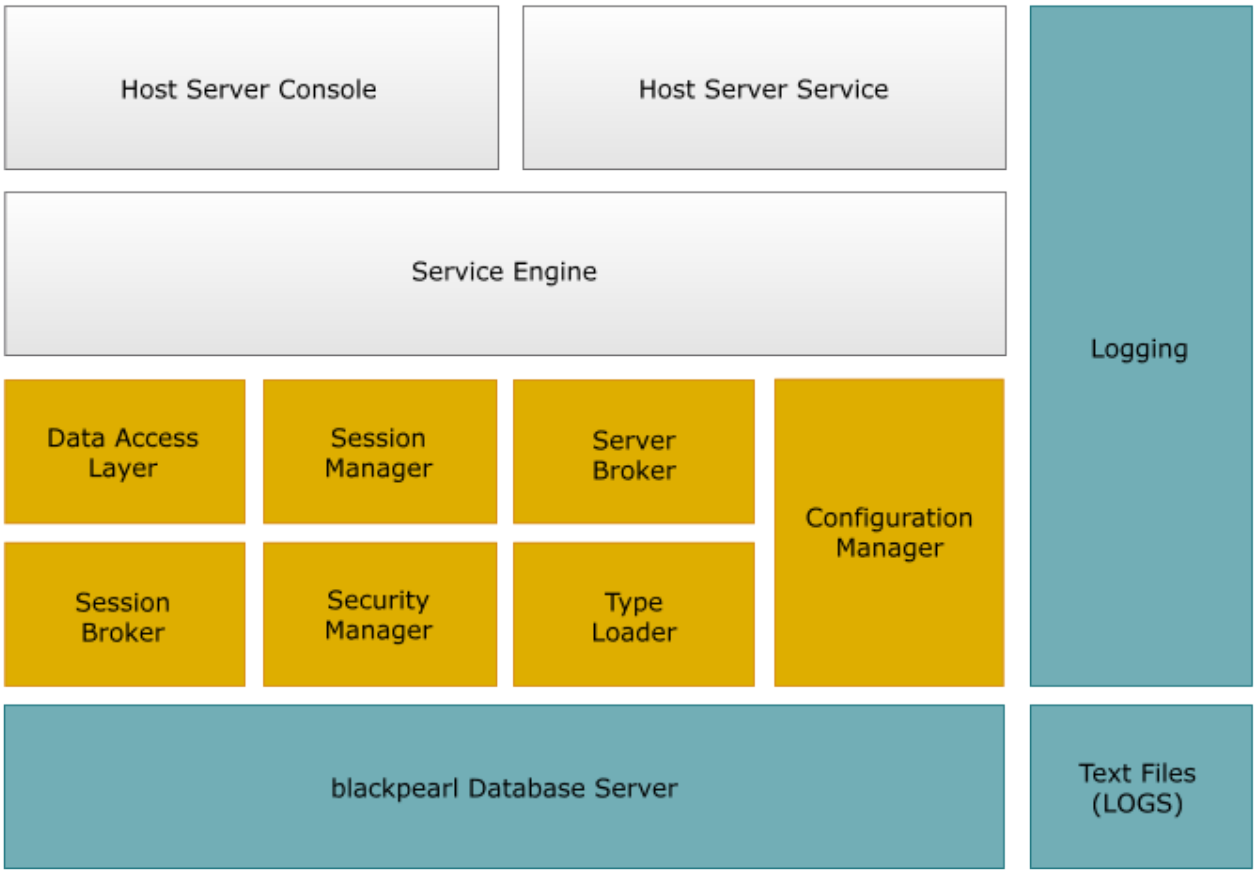

Fig. 1. K2 Server Architecture

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1.2 K2 Client

K2 Client with SmartForms

The K2 components installed on the client are used for design-time design of processes or workflows and SmartObjects. These currently include the K2 Designer for Visual Studio, K2 Studio, K2 Designer for SharePoint and K2 Designer. While the K2 Designer for SharePoint uses the same authoring API to build K2 project (.kprx) files, it runs as a component of SharePoint on a server. The K2 platform consists of three distinct areas of functionality: Authoring (or design-time), Management and Runtime. These aspects of the platform are illustrated in the following figure.

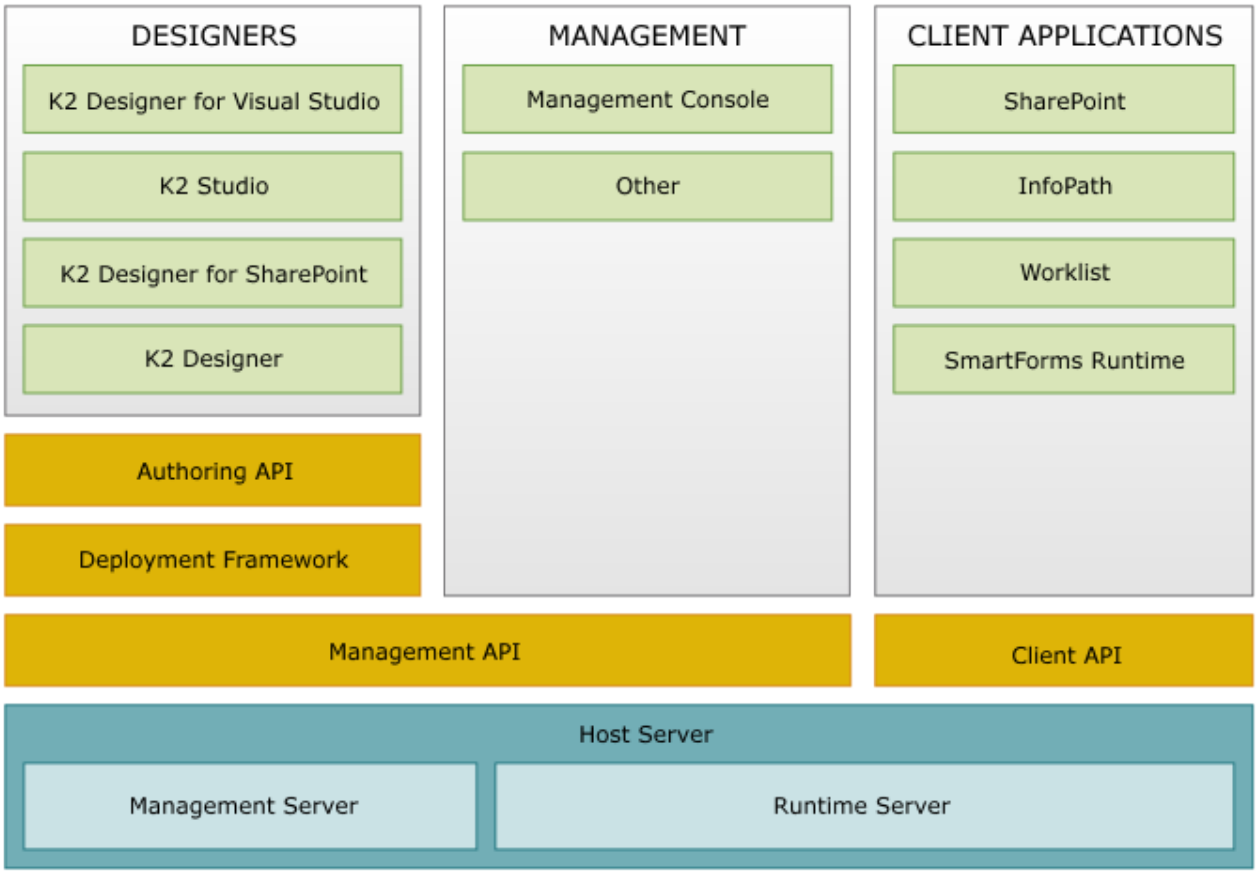

Fig. 1. K2 Client Architecture

The host server in the above figure is a simplified version of the architecture figures available in K2 Server. Add Workflow or SmartObject to the generic Management Server and Runtime Server to get an idea of how the API exposed the various hosted servers to the designers, the K2 Workspace and the client applications. Any part of these aspects of the K2 platform can be extended, for example with a custom designer, a custom management application, or a custom client. The deployment framework is based on MSBuild and uses the API of the Workflow Management, SmartObject Management and Environment Settings hosted servers.

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1.3 Integration Points and Communication Flow - Design Time

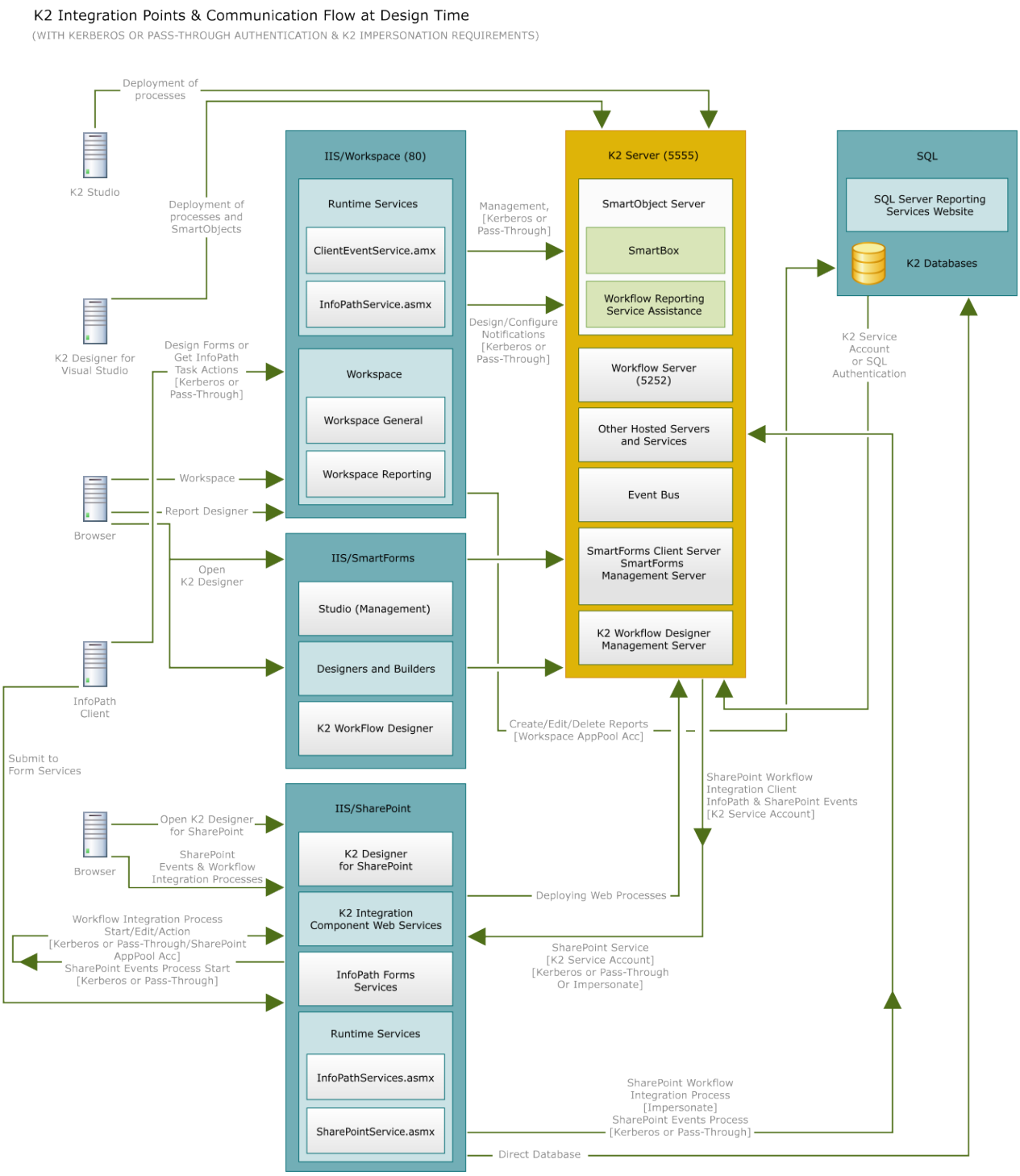

Fig. 1. SmartForms Architecture

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1.4 Integration Points and Communication Flow - RunTime

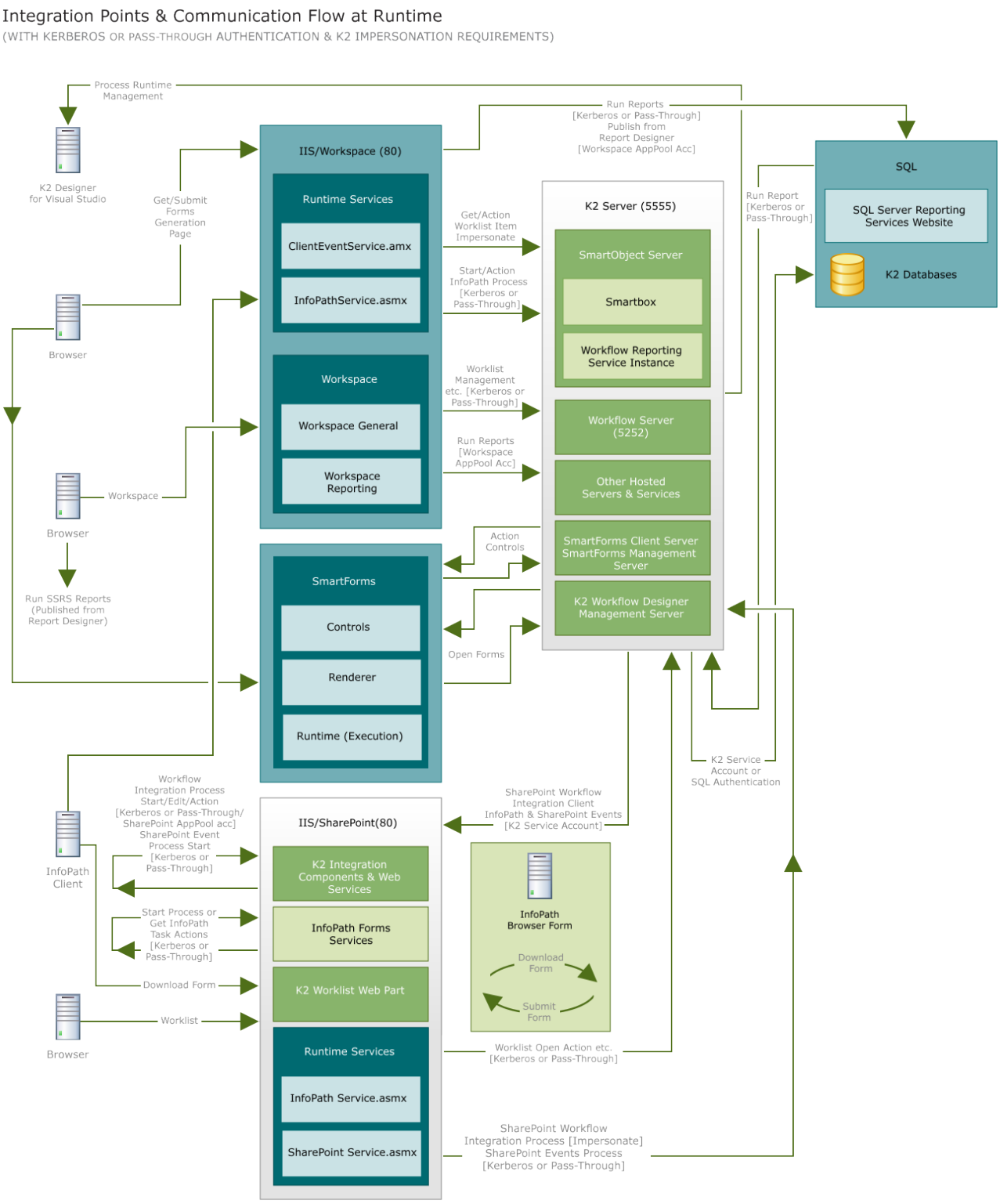

Fig. 1. SmartForms Architecture

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