SAP HANA Native Application Development

Thomas Jung, Director SAP HANA Product Management
• **Rationale:** Enable application development and deployment – minimize “layers”
  - with an http-based UI (browser, mobile apps)
  - to run directly on SAP HANA, without an additional external application
  - leveraging the built-in strengths of SAP HANA for the best possible performance

• **Scope**
  - Lightweight small web-based applications
  - Complex high-speed business applications with deep integration of differentiating SAP HANA database features
SAP HANA Native Application Development

Agenda

SAP HANA Extended Application Services - Intro
Demo: Develop Setup
Demo: OData Service Creation
Demo: Server Side JavaScript
SAP HANA Extended Application Services (XS)
Traditional 3-tier applications (Java, ABAP)

vs. Native SAP HANA Applications
Development Model

- UI Rendering completely in the Client
- Server-side procedural logic in JavaScript
- All artifacts stored in the SAP HANA Repository
Development Model

**XSODATA**

- Low coding OData REST service generation framework
- based upon existing tables and views
- Create/Update/Deletion operations support planned for SP6
Development Model

Specialized Service Frameworks

- XSXMLA – XML for Analytics
- InA Information Access
Padding Text

Padding Text

Server Side JavaScript (XSJS)

- Light weight procedural logic
- Openness
- Reuse
- One Language – Client and Server Side
- Widespread Knowledge
Development Model

Repository Representation of Catalog Objects

- Schemas: HDBSchema
- Tables: HDBTable
- Views: HDBView
- Structures: HDBStructure
- Sequences: HDBSequence
- Roles: HDBRole
**CDS – Core Data Services**

- Data Definition Language
- Query Language
- Expression Language
Development Model

**Data Intensive Logic**

- SQLScript / SQL
- HANA Views
  - Attribute
  - Analytical
  - Calculation
- Application Function Library (AFL)
  - Business Function Library (BFL)
  - Predictive Function Library (PFL)

![Diagram showing various components like UIS, SAPUI5, XSJS, XSODATA, XSXMLA, InA, CDS, HDBTable, HDBRole, SQLScript, SQL, Views, AFL]
DEMO: Development Setup
DEMO: OData Service
DEMO: Server Side JavaScript
Further Information

SAP Internal Resources

XS Community: https://community.wdf.sap.corp/sbs/community/xs?view=overview

Public Resources

XS Overview blog:

Official SAP Documentation:
http://help.sap.com/hana_appliance#section5 > SAP HANA Developer Guide; SAP HANA XS JavaScript Reference; SAP HANA SqlScript Reference

RKT Materials:
http://service.sap.com/rkt-hana > SAP HANA 1.0 > Technology Consultant SPS05
+ SAP HANA user management
+ Optimization options
+ Homogenous technology stack
+ Management of all artifacts

= Low TCO + high performance
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THANK YOU FOR PARTICIPATING

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SESSION CODE: 0708

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Appendix A: SAP HANA Extended Application Services

Thomas Jung / SAP HANA Product Management
Ron Silberstein / SAP HANA Product Management
HANA Application Services overview

Rationale: Enable application development and deployment – minimize “layers”
- with an http-based UI (browser, mobile apps)
- to run directly on SAP HANA, without an additional external application server which minimizes TCO
- leveraging the built-in strengths of SAP HANA for the best possible performance

Scope
- From lightweight environment for small web-based applications
- To robust environment for complex high-speed business applications which utilize the deep integration with the differentiating SAP HANA database features
ABAP and HANA Application Services strategic usages

**ABAP**

- Support HANA specific features plus a variety of traditional Databases
- Available now (BW 7.30, Gateway 2.0 SP4, Accelerators)
- Continues innovation of current applications

**HANA Application Services**

- Applications built to run only on HANA
- Project Solution Status in SP5
- New applications
SAP HANA Application Services:
Overview
An application’s foundation

- Presentation logic
- Control flow logic
- Calculation logic
- Data
Performance gains with HANA
Modern clients handle presentation logic

Client

Presentation logic

Control flow logic

HANA

Calculation logic

Data
Push the control flow down!

Client

Presentation logic

Control flow logic

HANA

Calculation logic

Data
Push the control flow down!
The essence of HANA Application Services (XS)!

- **Presentation logic**
- **Control flow logic**
- **Calculation logic**

**Client**

**HANA**

**XS**

**Data**
HANA Application Services Programming Model
Programming model – paradigm shift: responsibilities in runtime layers

Classic NW ABAP Layers

- **SAP GUI**
  - Display pre-rendered UI
  - Proprietary Protocol

- **ABAP**
  - **UI Rendering**
  - **Application Logic**
    - DBI/DBSL, DB buffer
    - SQL

  - Other RDBS
    - SQL (high retrieval load, no scripts)

XS Applications

- **Browser**
  - Complete UI Rendering
    - HTML5: Javascript execution
  - http(s); OData (pure data only)

- **HANA**
  - XSEngine
    - Procedural Appl. Logic
    - HdbNet (minimal data volume)
  - IndexServer
    - Data-oriented Appl. Logic
      - (HDB-SQL, SQLScript)
Programming model

UI Rendering should be implemented completely in the Client
- Server generically supports data exposure (via OData) and static UI content provisioning
- Browser-based applications should use HTML5, especially SAP UI 5
- Ability to leverage the Open Social component model
- Additional UI features provided by the Portal Services: navigation, page building, mash-ups, personalization

Server-side procedural logic in JavaScript

Data-intensive logic to be pushed down to the index server processes via Native SAP HANA View Types or SQLScript

Application artifacts are stored in the SAP HANA Repository
Built-in services

**Inbound channel**
- HTTP

**UI services**
- SAPUI5
- Portal Services

**Odata**
- Drastic code reduction

**Configuration**
- Easy language, built-in extensibility

**Outbound connectivity**
- HTTP, SMTP
SAPUI5

- Enterprise-Ready HTML5 Rendering Library
- Completely client-side UI
- Open and flexible
- Web development skills (HTML, CSS3, JavaScript)
- Extensibility and Theming
- 3rd Party JavaScript Integration
- Targets Multiple Devices
  - Smartphone, Table, Desktop
Control and data artifacts in one repository

Client
- Presentation logic
  - Presentation artifacts

HANA
- Control flow logic
  - Control flow artifacts
- Calculation logic
  - Data artifacts

Data
We manage **all** artifacts in one repository!

Client

- Presentation logic
  - Presentation artifacts

HANA

- Control flow logic
  - Control flow artifacts
- Calculation logic
  - Data artifacts

Data
The SAP HANA repository

- Object management, versioning and transport
- Software component delivery and patching
- Built-in support for translatable texts
- Support for server based development
+ HANA user management
+ Optimization options
+ Homogenous technology stack
+ Management of all artifacts

= Low TCO + high performance
? = JavaScript

✓ Widespread
✓ Fast
✓ One language
✓ Rapid development
HANA Application Services Architecture
Lightweight architecture
Architecture in more detail: SAP HANA XS Engine Process
End to end architecture
Further Information

SAP Internal Resources

XS Community: https://community.wdf.sap.corp/sbs/community/xs?view=overview

Public Resources

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RKT Materials:

http://service.sap.com/rkt-hana > SAP HANA 1.0 > Technology Consultant SPS05
Hana UI Integration Services (UIS) Goal and Components

Allow XS application developers to concentrate on the core functionality of their application, by providing UI services that enable the creation of multiple experiences

A part of the Hana Developer Workbench released to Customers with SPS 5:

- An XS application
- Hana Repository Plug-Ins
- Eclipse Plug-Ins for Hana Studio
Hana UI Integration Services Current Features

- **Page building**
  - State-of-the-art design environment of the application layout and content

- **Property persistence and customization**
  - Widget can define properties that are persisted enabling customization

- **Property personalization**
  - Widget can define properties that are persisted on user level

- **Publish-Subscribe**
  - Eventing mechanism that allows data interchange between widgets in the same application site

- **Context**
  - All properties are reflected in the URL allowing bookmarking and sharing
UIS Benefits for HANA App Developers

- Easily build and reuse application components by utilizing UIS widgets
- Design the application UI quickly and easily – UIS application site designer
- Create and manage all artifacts directly from Hana Studio and Hana repository
- Personalize and customize end-user preference
- Allow easy customer or partner application extensibility

Concentrate on the application core logic
Detailed architecture – fully integrated into Hana from index server to client
UIS Integration in HANA Studio
UIS – Web Based Application Site Designer
Main stakeholders: EERM SAP Global Facility Management and SAP Operation Process Intelligence
UIS 2013 Roadmap

2013 Planned Services

- Open Social Compliance
- Theming and Branding
- Navigation
- Authorization & Access Management
- Mobile Enablement

2013 Planned Content

- BI Visualization (Havana)
- Personal Task Inbox (POI)
- Embedded Search (InA)
- Widget templates (UI5 controls)