SharePoint Saturday
Stockholm

SPS EVENTS

Andvanced SharePoint Workflow Scenarios

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#SPSSTHLM18

February 14th, 2015

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About me

- Project Manager, Consultant, Trainer
- About 50 Microsoft certification exams passed, including MC(S)M
- MVP Office 365
- Focused on SharePoint since 2002
- Author of 10 books about XML, SOAP, .NET, LINQ, and SharePoint
- Speaker at main IT conferences

Microsoft SharePoint 2013 Developer Reference
Build Windows 8 Applications with Microsoft Visual C# and Visual Basic
Step by Step
Microsoft SharePoint 2010 Developer Reference
Full Contact XML & Web Services
XML
Introducing Microsoft LINQ
Programmare con XML
Building Windows 8 Apps with Microsoft Visual C++
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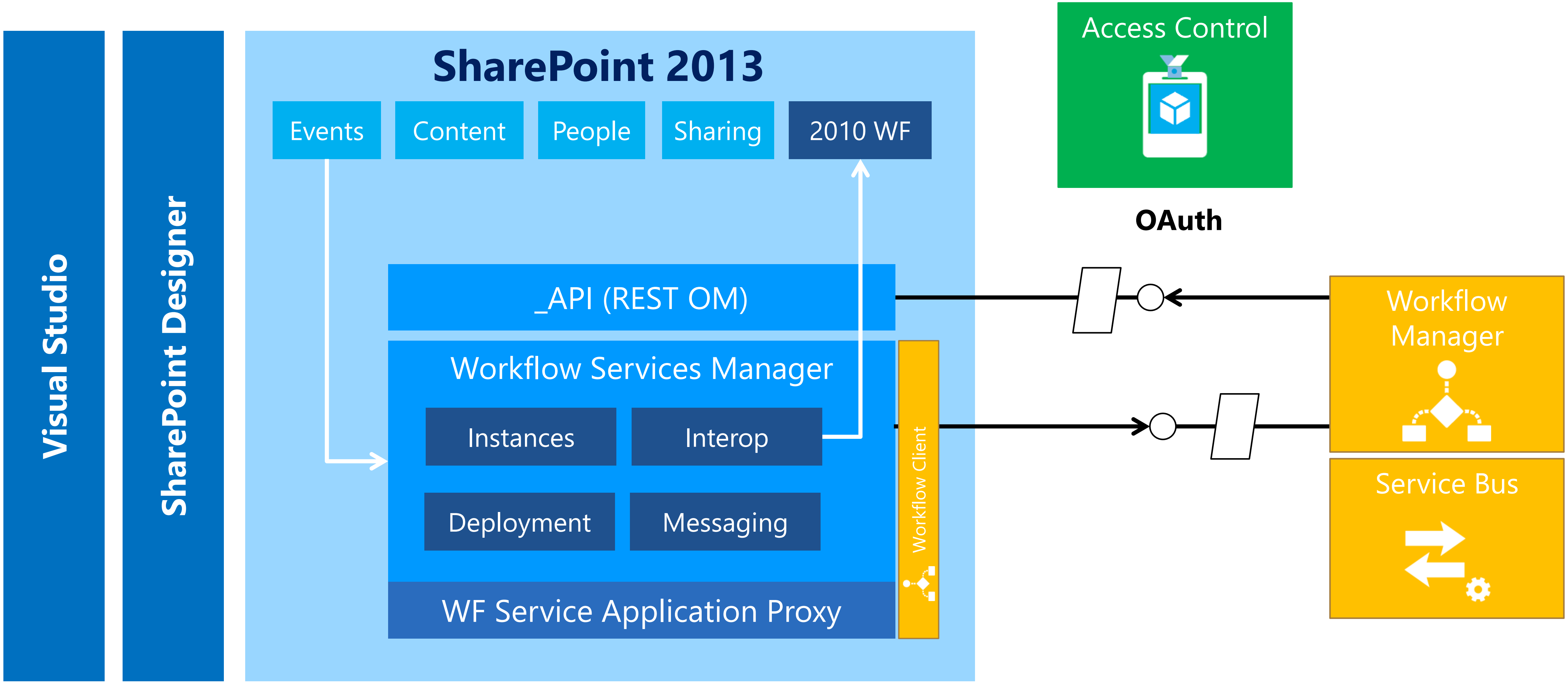
Workflow Architecture

Workflow Architecture



Good to Know and Limitations

Workflow Shapes

- Using Visual Studio 2013 you can create
  - Sequential Workflows
  - Flow Charts
  - State Machines
- You should choose the right shape
  - Depending on your goal
- Here are some examples
  - Sequential Workflows => Machine to Machine / Automated Flows
  - Flow Charts => Evaluation Flows or sub-flows
  - State Machines => Human Interaction and/or Long Running Flows

Known Facts

- The Workflow Manager uses the REST API to communicate with SharePoint 2013/Online
- The REST-based requests should leverage JSON serialization
- Security over HTTP(S) is based on OAuth/ACS
- Both SharePoint Designer and Visual Studio provide an HTTP Client action
  - Really useful to invoke remote REST service endpoints

Native Actions/Conditions

- Those available in SharePoint Designer 2013 are not enough for real business scenarios
- In Visual Studio 2013 there are almost the same activities
  - Plus some WF 4.x out of the box activities
  - You can extend the toolbox by adding new items
- You can create custom actions/conditions
  - Leveraging a declarative and no-code approach
- You can write code-based custom activities
  - But you will only target on-premises environments

Using declarative custom actions and the REST APIs you can do almost everything you need!

It's a matter of how many efforts it will need …

Common Business Requirements

Some Common Needs

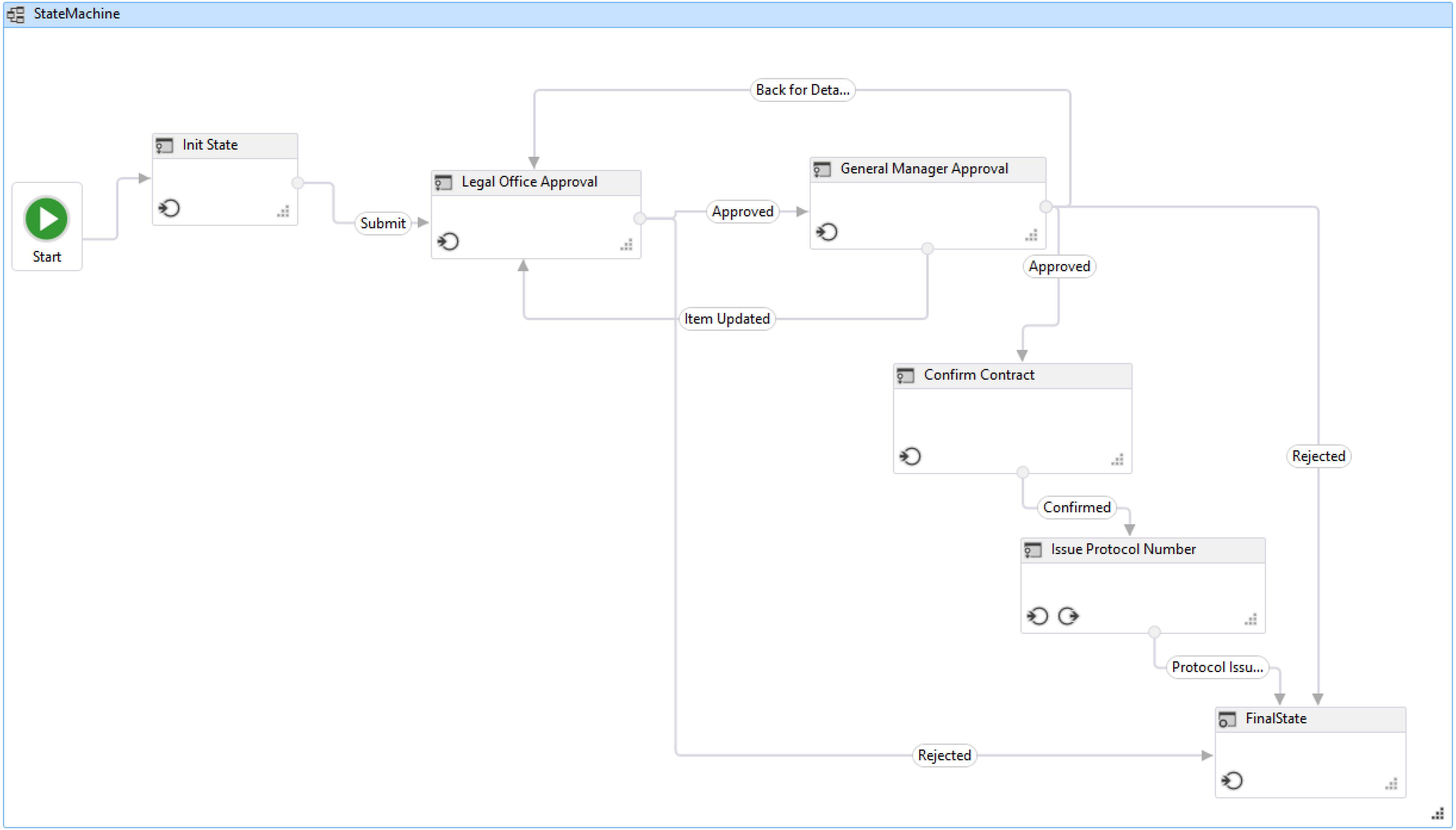
- Move files/items
- Assign custom permissions to items/tasks
- Create tasks with predecessors
- Wait for external (Line of Business) events
- Mobile support (i.e. mobile tasks)
- Customize UI and UI Actions
  - Initiation
  - Tasks
  - Workflow status
- Reporting and Statistics

Let’s see a “Real Scenario”

- Document approval workflow
- Multiple sequential approvers
  - Legal Office
  - General Manager
- With “Send back” capabilities
  - Request for review (from GM to Legals)
- Monitoring of changes
- Integrated with an external LOB system
  - External Protocol Service (kind of …)

A Possible Solution

- State Machine Workflow
- Custom UI Initiation and Task forms
- Custom UI Actions for activation/interaction
- External Asynchronous Events
- Target Item Monitoring


StateMachine
Start
Init State
Submit
Legal Office Approval
Back for Deta...
Approved
General Manager Approval
Approved
Item Updated
Confirm Contract
Rejected
Confirmed
Issue Protocol Number
Protocol Issu...
FinalState
Rejected

DEMO

A sample workflow app solving real and common business requirements

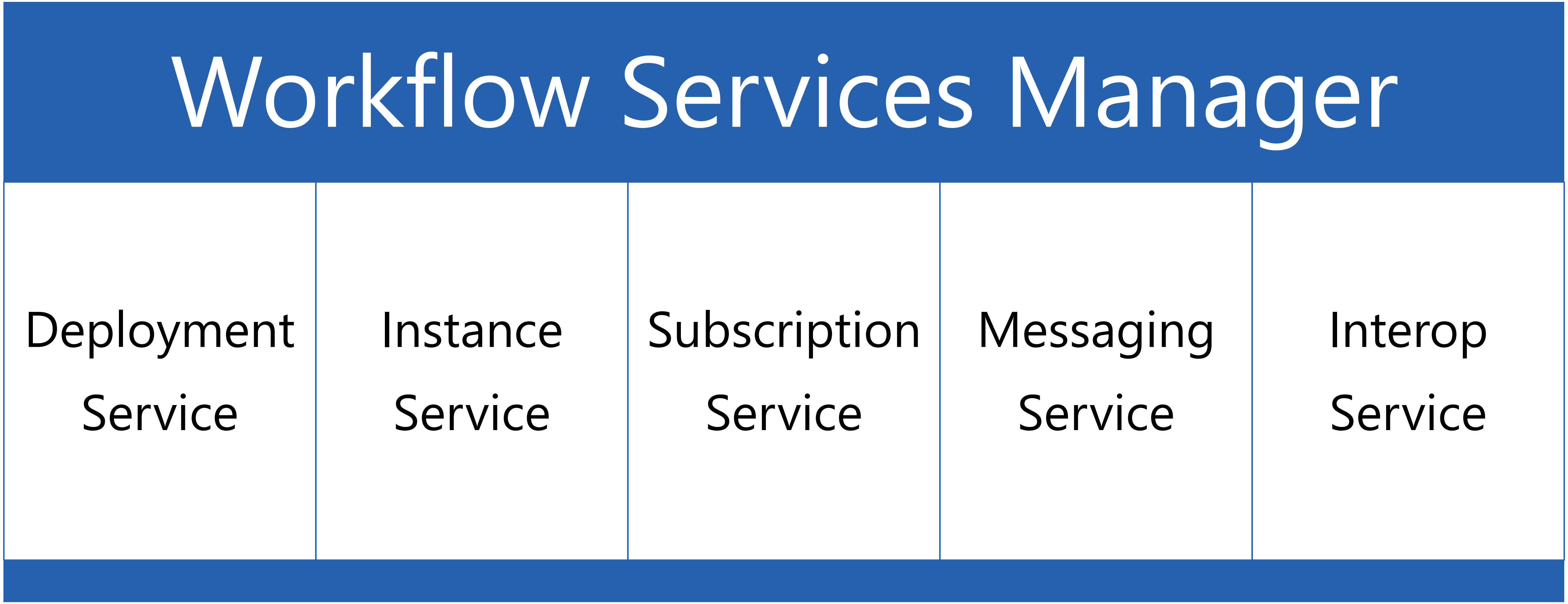
Technical Details

Custom Workflow Forms and Tasks

- When you create real business workflows
- You typically need to feed workflow instances with arguments
- And you need to provide “usable” tasks to target users
- However, the out of the box UI of SharePoint is really “rude” and “minimalist”
- You should create Custom Workflow Forms and Tasks

Understanding Workflow Forms

- Every workflow definition can have
  - Association Form: to associate a workflow definition to a target (0 or 1)
  - Initiation Form: to start a workflow instance on a target (0 or 1)
  - Task Forms: to provide custom UI for tasks (0 or more)
- Are common ASPX pages
  - But without .NET code, with client-side JSOM code only
  - You will need to interact with the Workflow Services Manager client library
- Visual Studio 2013 provides item templates for
  - Association and Initiation forms
- You need to manually define Tasks Forms
  - Leveraging custom Workflow Task content types and custom task lists
- Under the cover you will use the Workflow Services Manager client library



Workflow Services Manager

Deployment Service

Instance Service

Subscription Service

Messaging Service

Interop Service

DEMO

Creating custom Workflow Forms and Tasks with custom UI

Handling External Events

- Real business workflows need to interact with
  - External users
  - External software solutions (LOB, ERP, mobile apps, etc.)
  - Whatever else you need …
- You cannot always rely on tasks!
  - Tasks are OK for users’ interaction only!
- The Workflow Manager engine supports asynchronous custom events
- The workflow instance can be suspended while waiting for events
  - No CPU or RAM consumption
  - Workflow instance persistence and bookmarking

DEMO

Handling External Events

Handling Exceptions

- The out of the box engine provides
  - TryCatch (Try … Catches … Finally)
  - Throw
  - Rethrow
- Kind of Exceptions
  - Internal
  - External

Internal Exceptions

- Occur in your own business logic
- You should manage them properly
- Provinding some sort of logging
  - Mind the History List limits (more on this later …)
- Where it is possible define a way out
  - Or a retry policy
- Native activities (like HttpSend) have out of the box retry policies

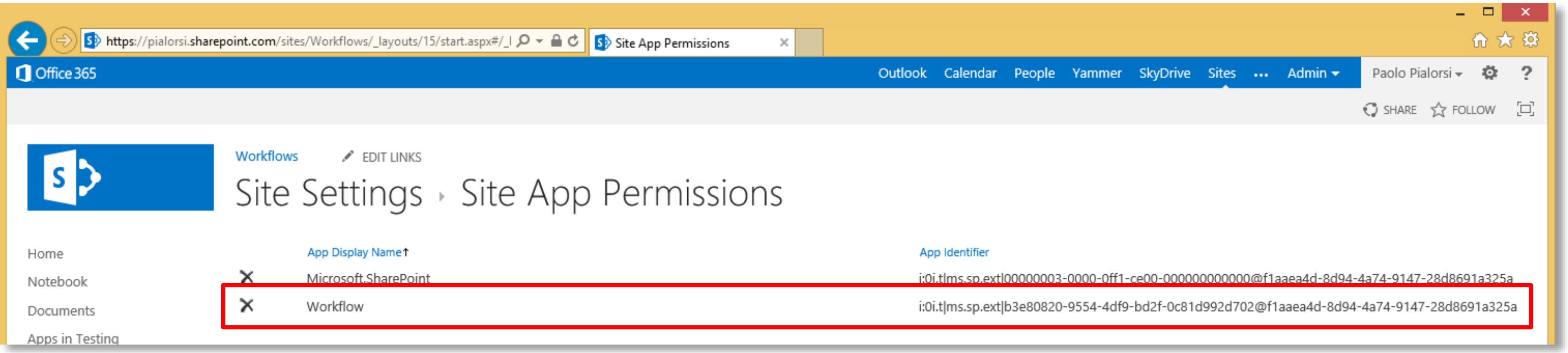
External Exceptions

- Those that don’t directly depend on you
  - Security Exceptions
  - Infrastructure issues
  - Etc.
- You should log them
  - And rethrow them
- Never try to solve or hide issues that don’t depend on you!

Workflow Security

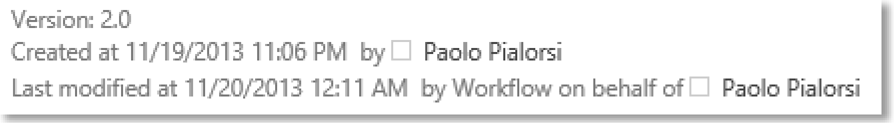
A Workflow is like an App

- The workflow engine has an App Principal
- You can manage app principals:
  - https://{hostname}/sites/{site}/_layouts/15/appprincipals.aspx?Scope=Web
  - https://{hostname}/sites/{site}/_layouts/15/appinv.aspx
  - https://{hostname}/sites/{site}/_layouts/15/appregnew.aspx



Site Settings › Site App Permissions

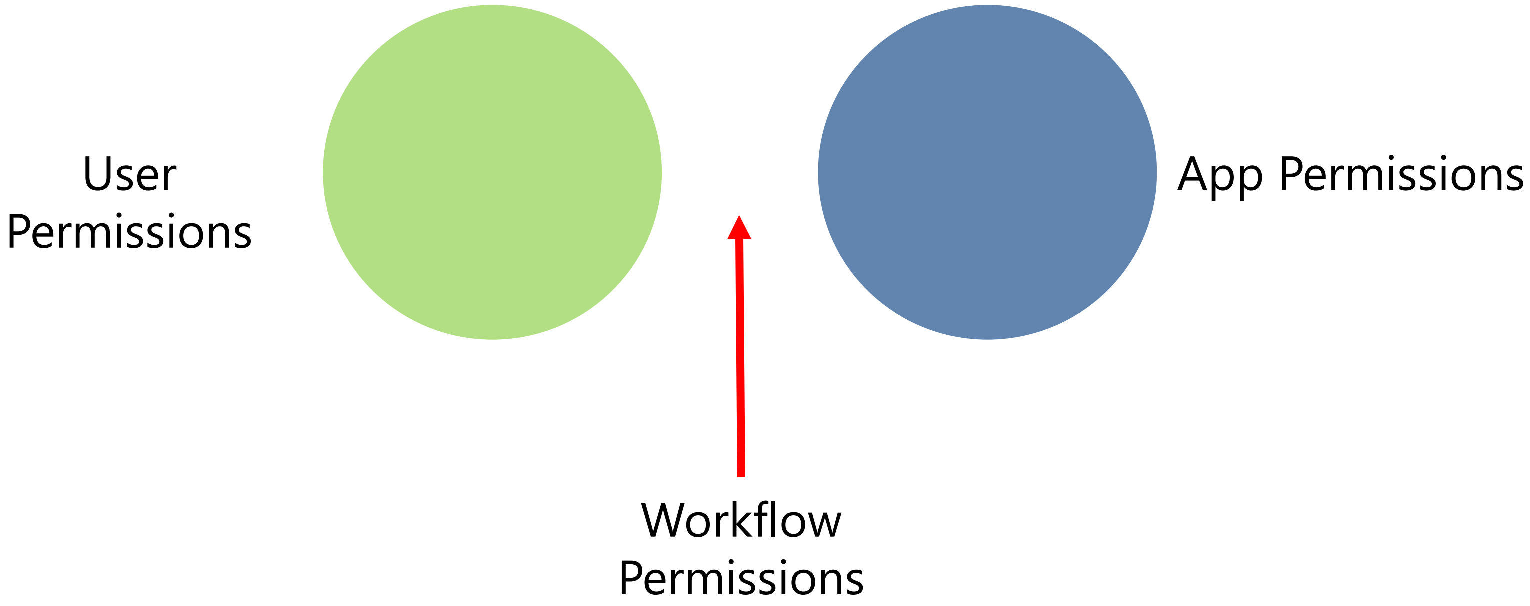
	App Display Name↑	App Identifier
✕	Microsoft.SharePoint	i:0i.t|ms.sp.ext|00000003-0000-0ff1-ce00-000000000000@f1aaea4d-8d94-4a74-9147-28d8691a325a
✕	Workflow	i:0i.t|ms.sp.ext|b3e80820-9554-4df9-bd2f-0c81d992d702@f1aaea4d-8d94-4a74-9147-28d8691a325a



Version: 2.0
Created at 11/19/2013 11:06 PM by □ Paolo Pialorsi
Last modified at 11/20/2013 12:11 AM by Workflow on behalf of □ Paolo Pialorsi

Default permission model

- Typically a workflow app has write permission level
- And while working leverages both
  - User permissions
  - Workflow App permissions



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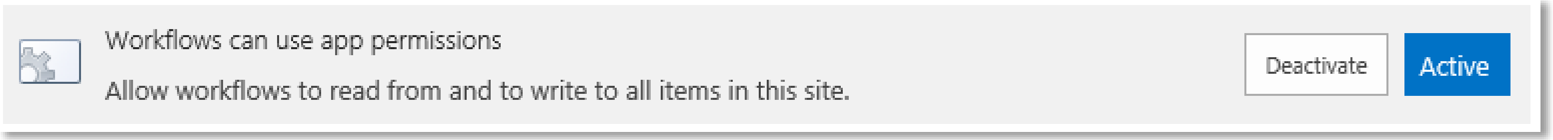
Configuring Workflow App Security

App Step and AppOnlySequence (recap)

- You can configure a web site to «Allow workflows to use app permissions»



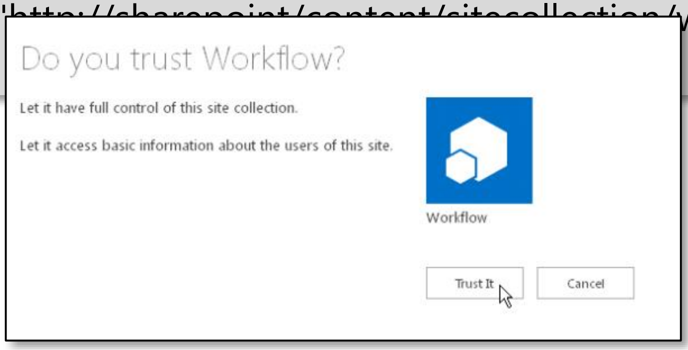
Workflows can use app permissions

Allow workflows to read from and to write to all items in this site.

- Assign «Full Control» to the workflow App Principal (appinv.aspx)

```
<AppPermissionRequests>
		<AppPermissionRequest Scope="http://sharepoint/content/sitecollection/web" Right="FullControl" />
</AppPermissionRequests>
```

- And Trust it!



Do you trust Workflow?

Let it have full control of this site collection.

Let it access basic information about the users of this site.

Notes from the Fields

Good Gotchas

- Remind that app web are deleted when apps are removed
  - Don’t store fundamental data in the app site
  - Rely on external repositories (DB, host web, etc.)
- Carefully consider target lists size
  - Mind the list view threshold
  - Mind the number of tasks and history items
- Use dedicated task lists and history lists for each workflow association
  - Avoid sharing the same lists for all workflow associations
- Avoid leveraging on Workflow History
  - In particular in Office 365/SharePoint Online
- Be really careful with item-level permissions
  - You could end up loosing control

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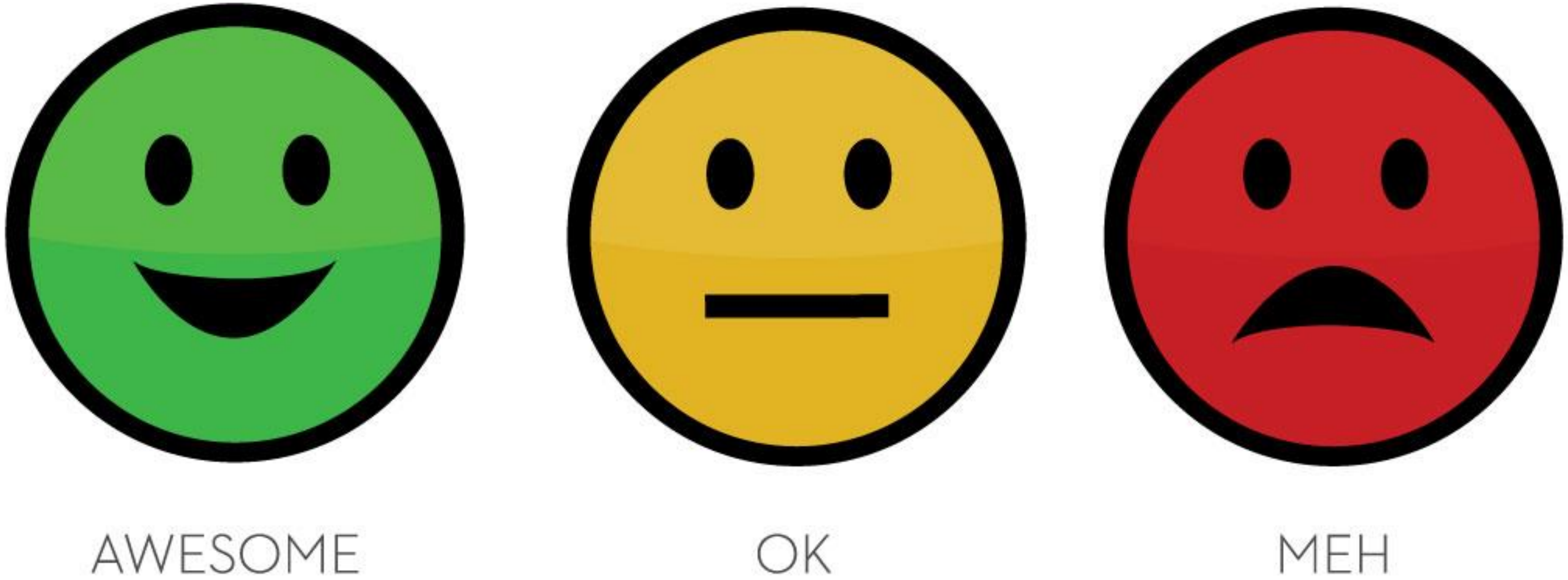

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