

What, Why, When and How? Sandboxed Solutions

ITPRO106

Mirjam van Olst

About Mirjam



- ▶ Microsoft Certified Master SharePoint 2007
- ▶ MVP SharePoint Server
- ▶ SharePoint Architect at Macaw
- ▶ Co-organizer for DIWUG and SDN

- ▶ Blog: <http://sharepointchick.com>
- ▶ Email: mirjam@macaw.nl
- ▶ Twitter: [@mirjamvanolst](https://twitter.com/mirjamvanolst)

Agenda

- ▶ What?
- ▶ Why?
- ▶ When?
- ▶ How?

WHAT?

Sandboxed Solutions

- ▶ SharePoint solutions (.wsp files)
- ▶ Uploaded to and deployed from Solutions Gallery at site collection level
- ▶ Completely isolated in the site collection
- ▶ Deployed to the database
- ▶ Cannot bring down your entire farm

Sandboxed Solutions

- ▶ Run within the Sandbox Worker Process (SPUCWorkerProcess.exe)
- ▶ Code Access Security policy:
 - `SharePointPermission.ObjectModel`
 - `SecurityPermission.Execution`
 - `AspNetHostingPermission.Level = Minimal`
- ▶ Exposes a subset of `Microsoft.SharePoint`
- ▶ Deployed to a site collection
- ▶ Managed and monitored in Central Administration

A Subset of Microsoft.SharePoint

Microsoft.SharePoint *Except*

- **SPSite** constructor
- **SPSecurity** object
- **SPWorkItem** and **SPWorkItemCollection** objects
- **SPAlertCollection.Add** method
- **SPAlertTemplateCollection.Add** method
- **SPUserSolution** and **SPUserSolutionCollection** objects
- **SPTransformUtilities**

Microsoft.SharePoint.Navigation

Microsoft.SharePoint.Utilities *Except*

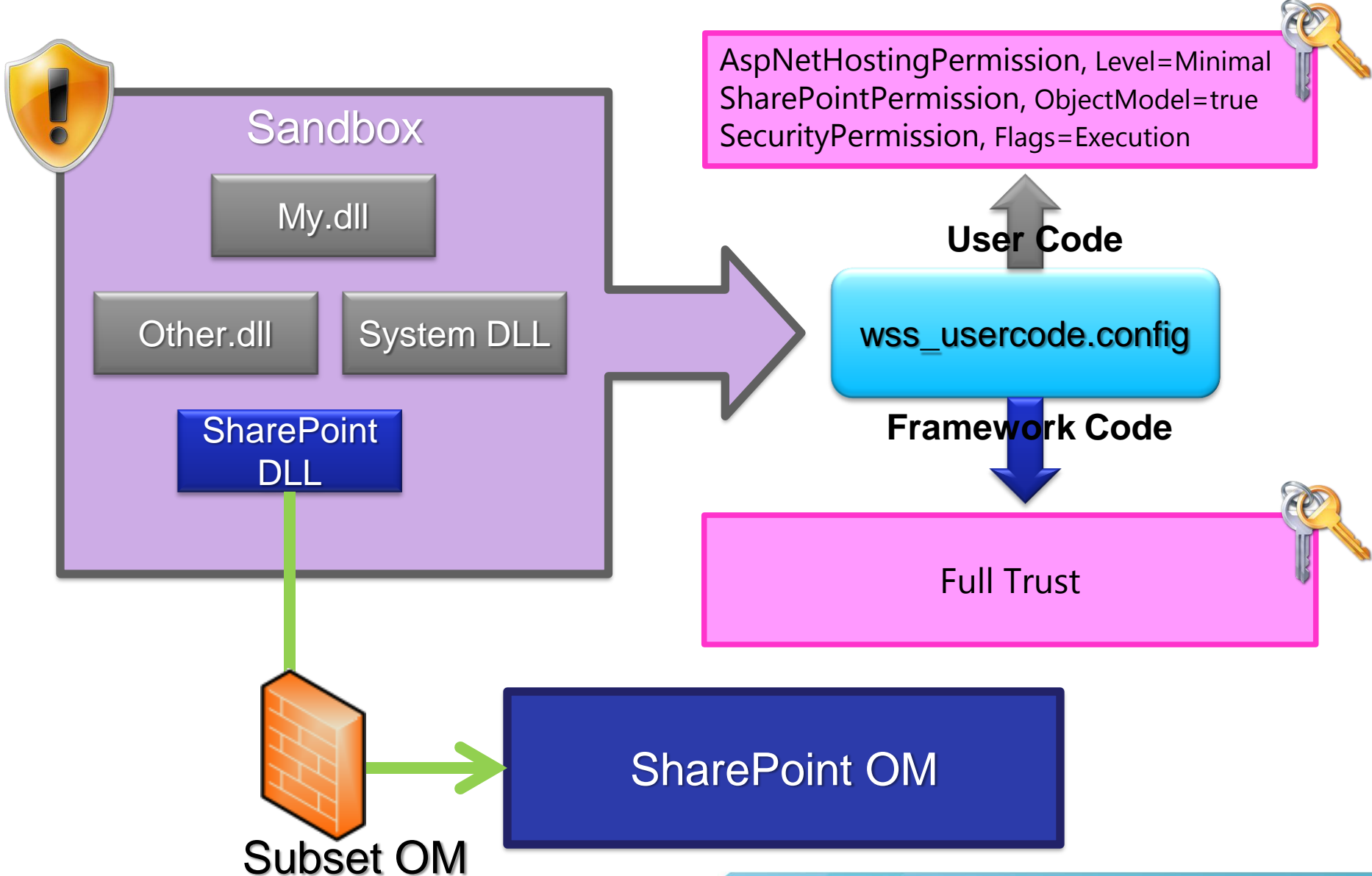
- **SPUtility.SendEmail** method
- **SPUtility.GetNTFFullNameandEmailFromLogin** method

Microsoft.SharePoint.Workflow

Microsoft.SharePoint.WebPartPages *Except*

- **SPWebPartManager** object
- **SPWebPartConnection** object
- **WebPartZone** object
- **WebPartPage** object
- **ToolPane** object
- **ToolPart** object

Sandbox and Code Access Security



Solution Gallery

Site Collection Library

- Located at `_catalogs/solutions`
- Upload, activate, deactivate, delete

The screenshot shows the SharePoint 2010 Solution Gallery interface in Internet Explorer. The browser address bar shows the URL `http://wingtip.com/_catalogs/solutions/Forms/AllItems.aspx`. The page title is "Solution Gallery". The navigation bar includes "Site Actions", "Browse", "Solutions", "Share & Track", and "Library Tools". The "Library Tools" tab is active, showing "Upload Solution", "Activate", "Deactivate", and "Upgrade" options. A "Give Feedback" button is also visible. The main content area displays a resource quota warning: "Your resource quota is 300 server resources. Solutions can consume resources and may be temporarily disabled if your resource usage exceeds your quota." Below this, there are two progress bars for "Current Usage (Today)" and "Average Usage (Last 14 days)". A table header is visible with columns for "Name", "Edit", "Modified", "Status", and "Resource Usage". The table is currently empty, with a message stating "There are no items in this view of the Solution Gallery. To add a solution, click a command above." The left sidebar contains navigation links for Documents, Lists, Discussions, Sites, and Recycle Bin.

Solution Monitoring

- ▶ Farm Administrators
 - Set absolute limits
- ▶ Site Administrators
 - Identify expensive solutions

Solution Monitoring

- ▶ Farm administrator assigns “resource points” to a site collection
- ▶ Points are calculated based on 14 metrics
- ▶ Metrics were chosen based on impact on health and stability of the server
- ▶ Metrics are called ResourceMeasures and are “normalized” through a ResourcesPerPoint property

Resource Quotas

Central
Admin

Site Quota Information

Use this section to modify the quota template on this Web site collection, or to change one of the individual quota settings.

Current quota template
Individual Quota

Limit site storage to a maximum of: MB

Send warning e-mail when site storage reaches: MB

Current storage used: 4 MB

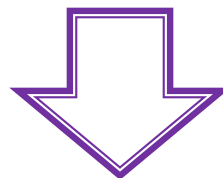
User Solutions Resource Quota:

Limit maximum usage per day to: points

Send warning e-mail when usage per day reaches: points

Current usage (today) 0 points

Average usage (last 14 days) 0 points



Solution
Gallery

Your resource quota is 300 server resources. Solutions can consume resources and may be temporarily disabled if your resource usage exceeds your quota.

Current Usage (Today)

Average Usage (Last 14 days)

Measured in 'Resource Points'

Resource Quota Measurements

Resource Measure	Resources Per Point
AbnormalProcessTerminationCount	1 termination
CPUExecutionTime	3,600 seconds
CriticalExceptionCount	10 exceptions
InvocationCount	100 invocations
PercentProcessorTime	85 percent
ProcessCPUCycles	100,000,000,000 cycles
ProcessHandleCount	10,000 handles
ProcessIOBytes	0
ProcessThreadCount	10,000 threads
ProcessVirtualBytes	0
SharePointDatabaseQueryCount	20 queries
SharePointDatabaseQueryTime	120 seconds
UnhandledExceptionCount	50 exceptions
UnresponsiveProcessCount	2 processes

WHY?

SharePoint 2007 Challenge

- ▶ Developers build custom solutions
- ▶ Administrators can only secure solutions with CAS
 - Hard to control what is being done in custom code
- ▶ Biggest cause of SharePoint support cases: custom code



Developer

- Design, build and test customizations



Administrator

- Install and monitor customizations



Site Collection Owner

- Activate and use customizations

SharePoint 2010 Approach

- ▶ Developers build custom solutions
- ▶ Site collection owners deploy, activate and implement the customizations
- ▶ Administrators leverage resource monitors to check site collection usage



Developer

- Design, build and test customizations



Administrator

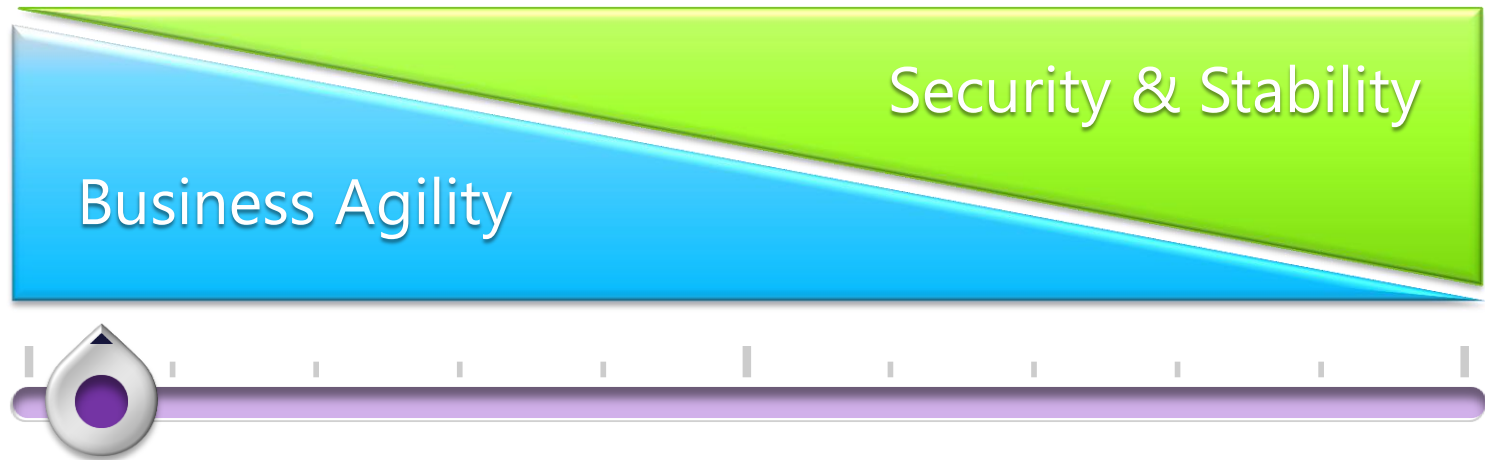
- Monitor customizations



Site Collection Owner

- Activate and use customizations
- Install customizations

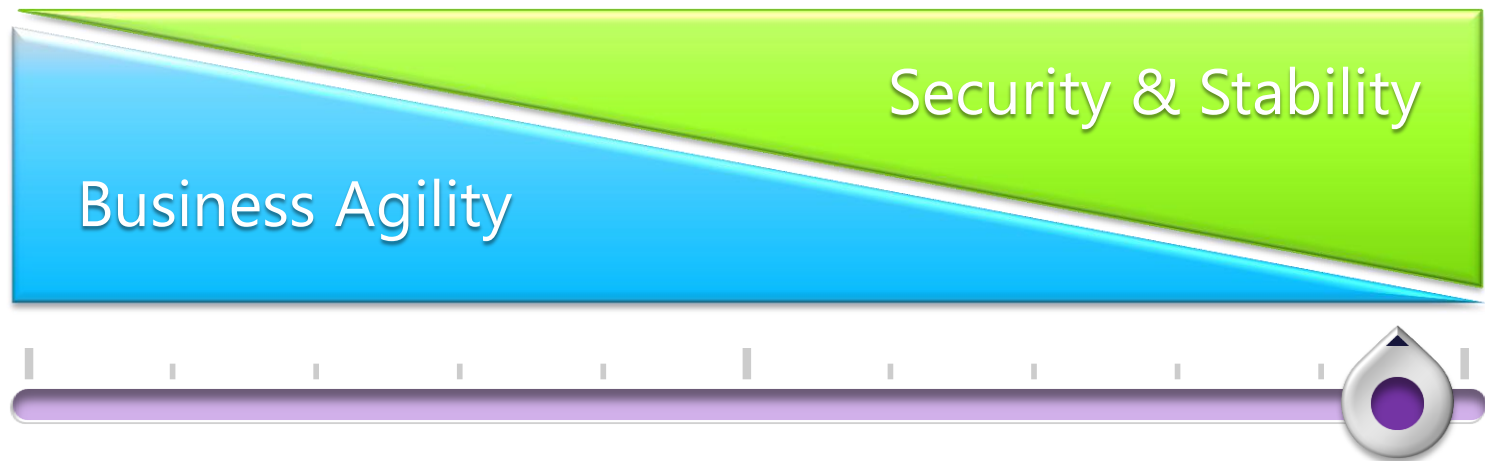
Sandboxed Solutions – Why?



Totally Agile Business

- Simple deployment model
- Limited restrictions on developer access to farm
- All resources are available to solutions
- Iterative development process

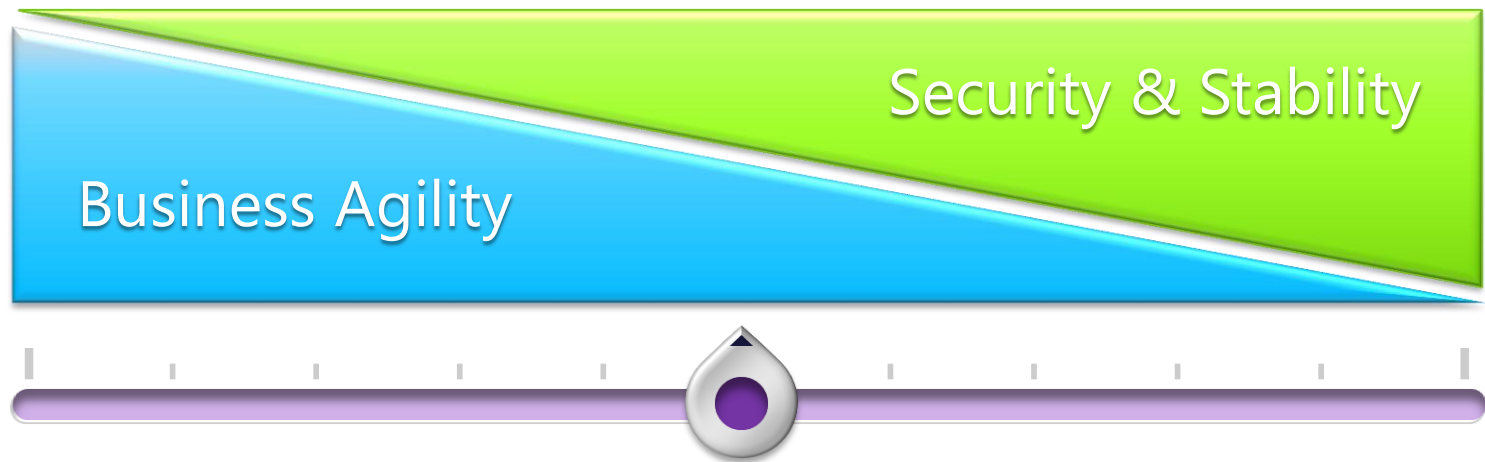
Sandboxed Solutions – Why?



Totally Stable & Secure

- 'Clean Room' Data Center
- Extensive change control process
- Formal code review
- Severe restrictions on resource access

Sandboxed Solutions – Why?



Essential Agility

- Easy deployment
- Iterative development

Essential Stability

- Limited API Access
- Monitored

Sandboxed Solutions Help Enterprises

- ▶ Sandboxed solutions are important because
 - Solve SharePoint hosting issues in corporate environments
 - Hosted environments much easier to manage
- ▶ Reduces time to deploy custom solutions
 - Removing process of getting code approved and deployed by IT
- ▶ Improves stability of SharePoint servers
 - Now badly performing code isolated to site collection rather than potentially bringing down an entire server

WHEN?

Always!

▶ Capabilities available in sandboxed solutions:

- List definitions
- List instances
- Onet.xml
- WebTemplate Feature
- Content Types/Fields
- Navigation
- Module/files
- Feature callouts
- Web Parts derived from
`System.Web.UI.WebControls.Webparts.WebPart`
- Event receivers (on items, lists and webs)
- Custom Actions
- Workflows

Well...almost always...

- ▶ Not available in sandboxed solutions:
 - Custom Action groups
 - HideCustomAction element
 - Web Application and Farm scoped Features
 - Timer Jobs
 - Visual Web Parts
 - ...

HOW?

Sandboxed Solution Lifecycle

Installation

- Upload into Solution Gallery
- Solution is validated upon installation

Activation

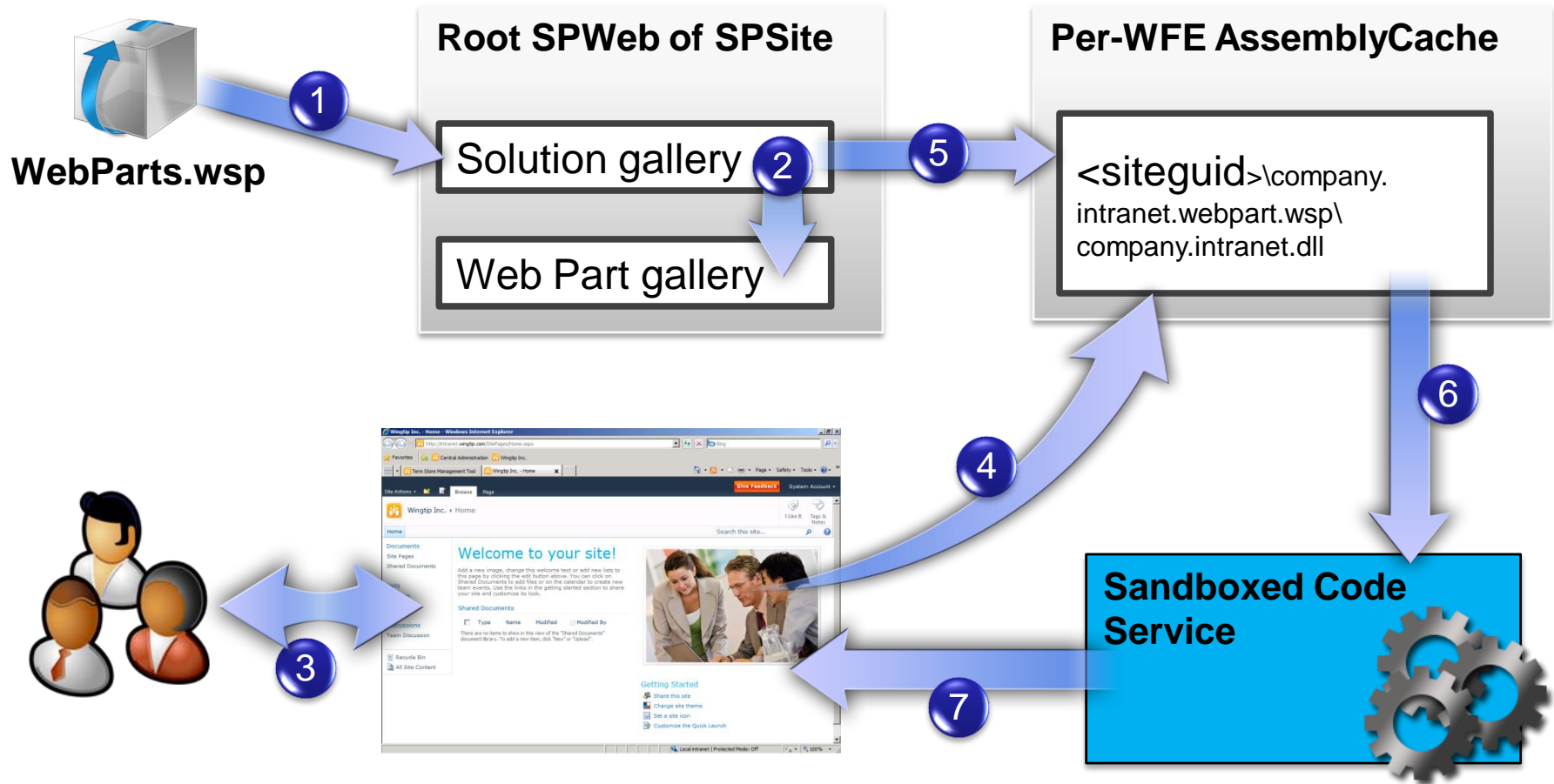
- Auto-activates features

Deactivation

- Inert operation, extended by developer
- Web Parts no longer execute

Deletion

Sandboxed Solutions Process



Demo

BUILDING A SANDBOXED SOLUTION

Summary

- ▶ Deployed to the site collection solution gallery
- ▶ Resources monitored from the site collection and Central Administration
- ▶ Subset of functionality available
- ▶ Quick and easy deployment
- ▶ Server stability

Thank you for attending!