Microsoft Research

A Service-Oriented Application for an Enterprise Datacenter

Alisson Sol
Development Manager
Microsoft Research Cambridge Incubation

The Rise and Rise of the Declarative Datacentre

Monday-Tuesday, May 12-13, 2008

Roger Needham Building, Microsoft Research Cambridge

Agenda

- A Service-Oriented Application for an Enterprise Datacenter
  - Motivation for “Datacenter” applications
  - Why the “Cloud” is not the universal panacea
- Service Models
  - Practical look at some current tools
- Call to Action
  - After reviewing common problems, a very short wish list from the developer/IT point-of-view

Business Scenario

- REDMOND, Wash. — January 24, 2008 — Microsoft Corp. announced second quarter revenue: $16.37 billion
- Business Outlook
  - Microsoft management offers the following guidance for the quarter ending March 31, 2008:
    Revenue is expected to be in the range of $14.3 billion to $14.6 billion.

- Error Margin: $0.3 billion / 14.3 billion ~ 2%

Fast Forward

- REDMOND, Wash. — Apr. 24, 2008 — Microsoft Corp. today announced third-quarter revenue: $14.45 billion

- Remember Guidance: "**Revenue is expected to be in the range of $14.3 billion to $14.6 billion.**"
  - More than 600 "Contributors" all around the world
  - About 300 "Reviewers", and "Approvers"
  - A team of about "50" "Business Modelers"
  - IT resources with rigorous security policies to follow

Financial Datacenter Applications

- Data Is More Important Than Any Process
  - Cannot “Reboot” and continue like typical online web services
  - Non-repudiation of every data change
- Deployment Data Is a Secret
  - Server names, locations, accounts, etc.
- Several “Services” Need to be “Connected”
  - Database, authentication, file Share, etc.

Many Meanings of “Application”

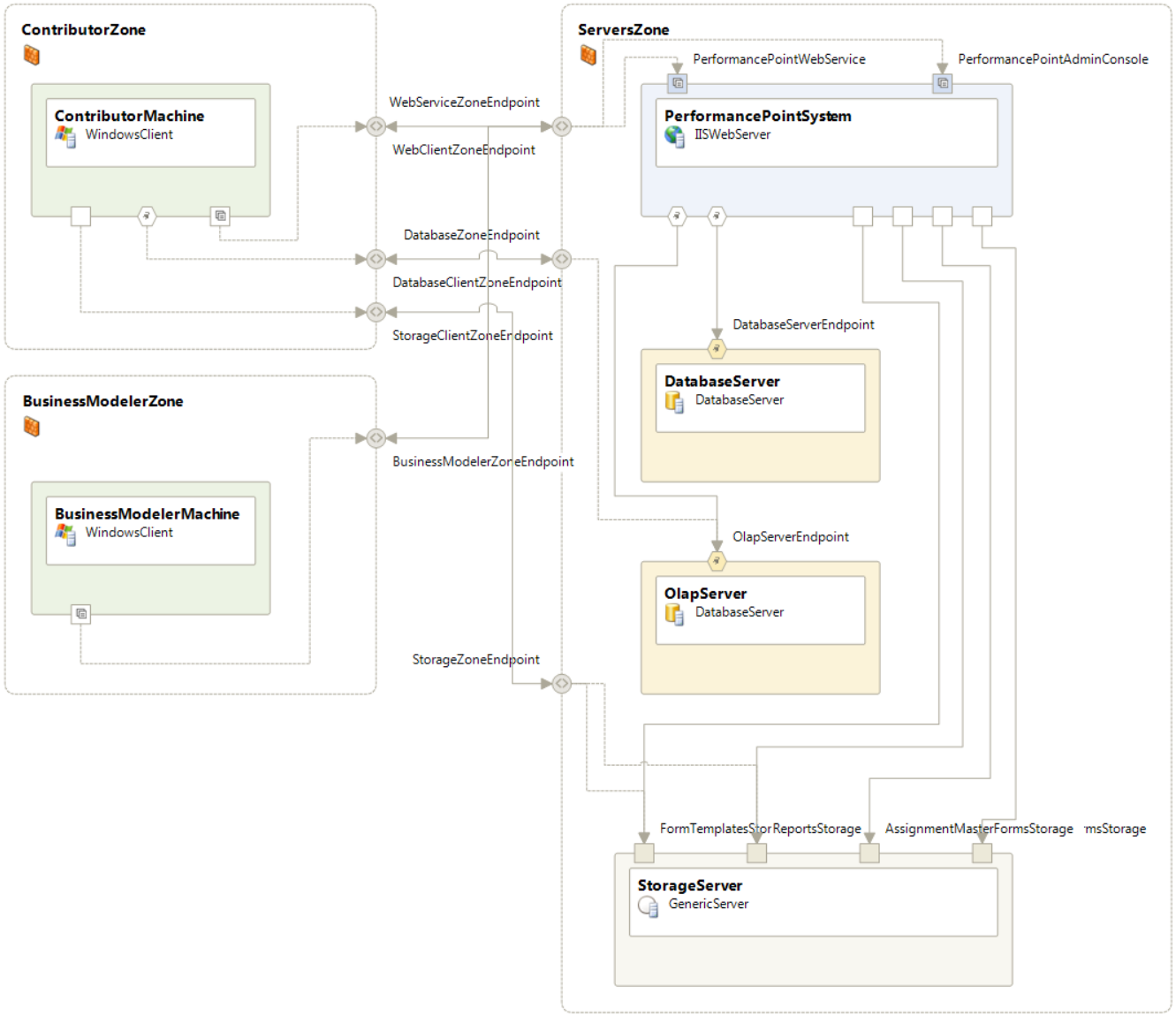
- Operating System Level
- Services Level
- Tools
- “Integration Packages” (Vertical Frameworks)
- Vertical Applications

Services Used by Financial Applications

- File Servers
- Web Servers
- Relational Databases
- Hierarchical Databases
- Authentication Services
- Application Services
  - Implementing Business Rules
  - Proxies for legacy or external applications
- Web Services
  - Management Hierarchy
  - Business Organization (Subsidiaries, Products, …)

Application Diagram

Logical Datacenter Diagram

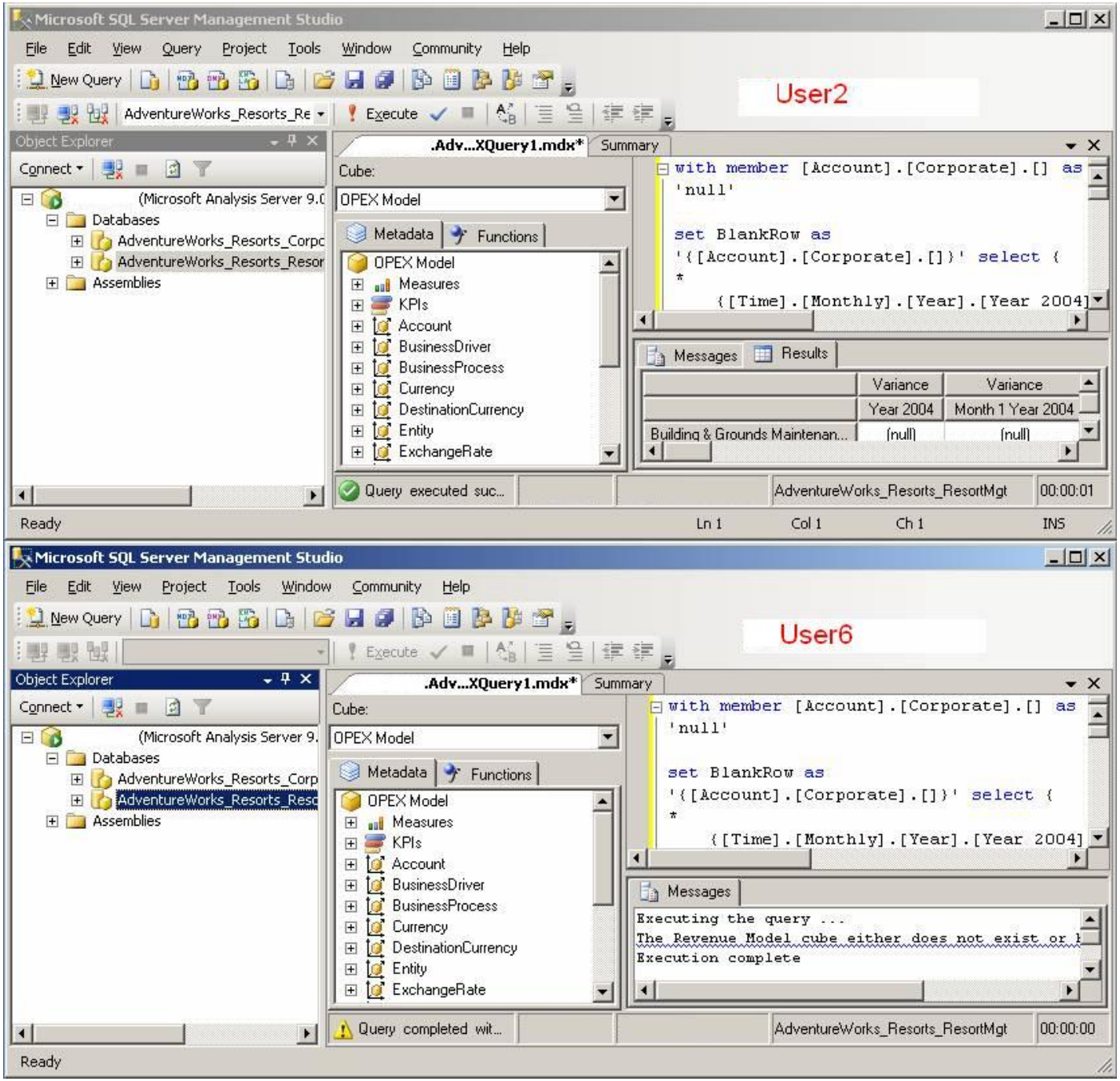


Sample Application Deployment

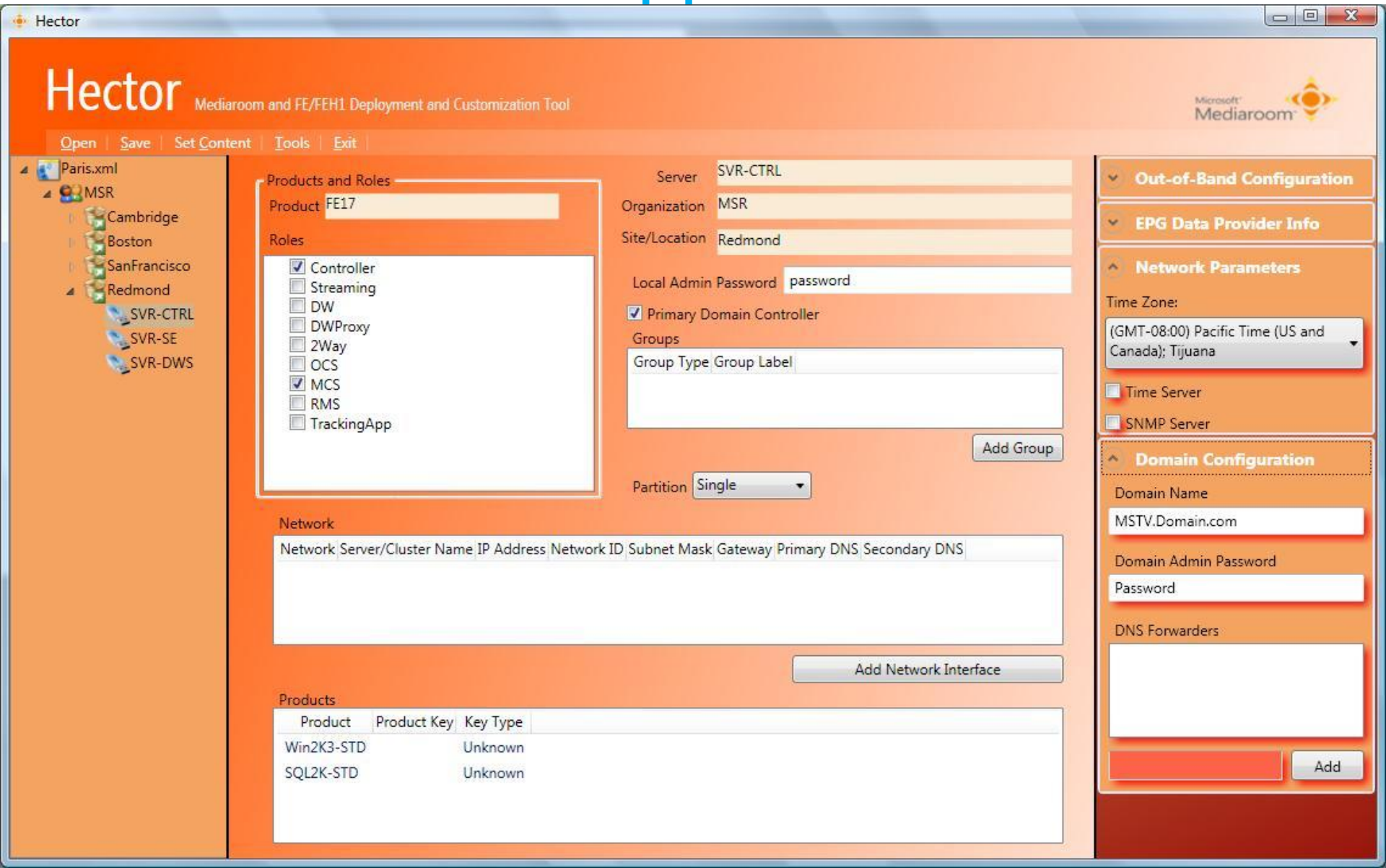
```
<DeploymentConfig>
<!-- Servers and Services -->
   <Parameter Name="ReferenceDatabaseServer" Type="Server">server</Parameter>
   <Parameter Name="AnalysisServicesServer" Type="Server">server</Parameter>
   <Parameter Name="PerformancePointWebService" Type="Uri">http://server:46787</Parameter>
<!-- Storage Locations -->
   <Parameter Name="FormTemplatesLocation" Type="Uri">\\server\Form_Templates</Parameter>
   <Parameter Name="ReportsLocation" Type="Uri">\\server\Reports</Parameter>
   <Parameter Name="AssignmentFormsLocation" Type="Uri">\\server\Assignment_Forms</Parameter>
   <Parameter Name="AssignmentMasterFormsLocation" Type="Uri">\\server\Master_Forms</Parameter>
<!-- Users -->
   <Parameter Name="ContributorAccount" Type="Account">domain\user1</Parameter>
   <Parameter Name="ContributorAccountEmail" Type="Email">user1@example.com</Parameter>
   <Parameter Name="ReviewerAndApproverAccount" Type="Account">domain\user2</Parameter>
   <Parameter Name="ReviewerAndApproverAccountEmail" Type="Email">user2@example.com</Parameter>
   <Parameter Name="BusinessModelerAccount" Type="Account">domain\user3</Parameter>
   <Parameter Name="BusinessModelerAccountEmail" Type="Email">user3@example.com</Parameter>
</DeploymentConfig>
```

Common Deployment Issues

- Hard-coded Dependencies and Parameters
  - Web Server is not always at port 80
  - Web protocol is not always http (it may be https)
  - There is more than a single server
- The Physical Layer
  - A server with two network cards may only accept certain connections through one of the cards
- Security
  - Different accounts may be used in different connections
    - Security issues may be very hard to “debug” (see next slide)


Microsoft SQL Server Management Studio
File Edit View Query Project Tools Window Community Help
New Query
Execute
User2
Object Explorer
Connect
(Microsoft Analysis Server 9.0
Databases
AdventureWorks_Resorts_Corpc
AdventureWorks_Resorts_Resor
Assemblies
.Adv...XQuery1.mdx*
Summary
Cube:
OPEX Model
Metadata
Functions
OPEX Model
Measures
KPIs
Account
BusinessDriver
BusinessProcess
Currency
DestinationCurrency
Entity
ExchangeRate
with member [Account].[Corporate].[] as
'null'
set BlankRow as
'{[Account].[Corporate].[]}' select {
*
{[Time].[Monthly].[Year].[Year 2004]
Messages
Results
Variance
Variance
Year 2004
Month 1 Year 2004
Building & Grounds Maintenan...
(null)
(null)
Query executed suc...
AdventureWorks_Resorts_ResortMgt
00:00:01
Ready
Ln 1
Col 1
Ch 1
INS
Microsoft SQL Server Management Studio
File Edit View Project Tools Window Community Help
New Query
Execute
User6
Object Explorer
Connect
(Microsoft Analysis Server 9.
Databases
AdventureWorks_Resorts_Corp
AdventureWorks_Resorts_Resc
Assemblies
.Adv...XQuery1.mdx*
Summary
Cube:
OPEX Model
Metadata
Functions
OPEX Model
Measures
KPIs
Account
BusinessDriver
BusinessProcess
Currency
DestinationCurrency
Entity
ExchangeRate
with member [Account].[Corporate].[] as
'null'
set BlankRow as
'{[Account].[Corporate].[]}' select {
*
{[Time].[Monthly].[Year].[Year 2004]
Messages
Executing the query ...
The Revenue Model cube either does not exist or h
Execution complete
Query completed wit...
AdventureWorks_Resorts_ResortMgt
00:00:00
Ready

Other Applications



Call to Action

- Standards for the configuration files
  - Single one (SML, WS-Management, CIM)
- Deployment and monitoring tools that are “metadata based”
  - Remote verification keeping secrets
    - “I notice that the application service cannot connect to your database endpoint”
- Scalability
  - “Accelerators” for large deployments
- Deployment Information As “Language Feature”
  - Avoid repeating UML (Unified-Modeling Language): the model is perfect, just out-of-sync with the code…

Online Resources

- Dynamic Systems Initiative
  - http://www.microsoft.com/dsi
- Service Modeling Language
  - http://www.w3.org/XML/SML/
- WS-Management
  - http://www.dmtf.org/standards/wbem/wsman
- Common Information Model
  - http://www.dmtf.org/standards/cim
- Microsoft Office PerformancePoint
  - http://www.microsoft.com/business/performancepoint/
  - PerformancePoint Sample: Plannning Data
  - PerformancePoint Sample: Monitoring Data
  - PerformancePoint Sample: Data Integration Kit