Microsoft | Services

CRM 2011 Architecture Overview and Demo

STRATEGY ▪ CONSULTING ▪ SUPPORT

Architecture Overview and Demo

- Dynamics CRM Architecture Overview
- Database Structure & Architecture
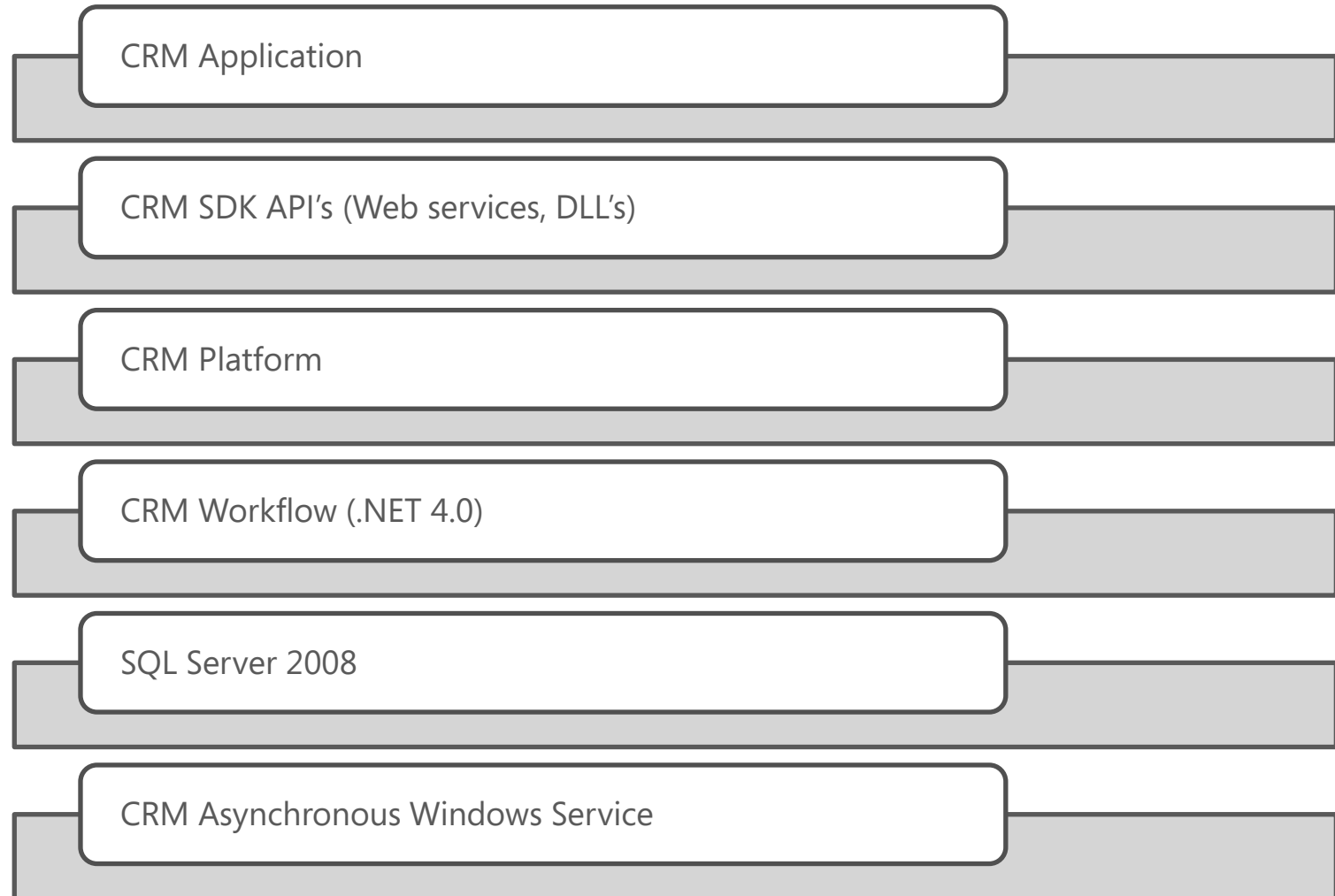- Performance
- CRM Roles and Privileges

Microsoft | Services

Microsoft | Services

Dynamics CRM Architecture Overview

STRATEGY ▪ CONSULTING ▪ SUPPORT

CRM Stack Technologies

- Windows 2008 IIS 7.0 *(Windows 2003 not supported)*
- ASP.NET / .NET 4.0
- Windows Workflow Foundation
- Windows Presentation Foundation
- Windows Communication Foundation
- Active Directory (2000 M/N, 2003 I/N, 2008, I/N)
- SQL Server 2008 *x-64 SP1 or later*
- SQL Server Reporting Services 2008
- Exchange / Pop3 / SMTP / custom mail protocol

CRM Architecture Overview

CRM Application

CRM SDK API's (Web services, DLL's)

CRM Platform

CRM Workflow (.NET 4.0)

SQL Server 2008

CRM Asynchronous Windows Service

CRM Architecture – Components

- Components:
  - Application:
    - Internet Explorer
  - Platform:
    - IIS/Managed Code
  - Workflow:
    - Windows Workflow.NET
  - Database:
    - SQL Server 2008
  - CRM Asynchronous Service:
    - Windows Service .NET Managed Code

Microsoft | Services

CRM Architecture – Application

- Presentation/Application Components
  - Internet Explorer 7+, 8+, 9
  - Outlook client (2003 SP3, 2007 SP1, 2010)
  - Reports
    - Reporting Services 2008
    - Excel
  - Customizations (WPF, aspx pages, etc)

Microsoft | Services

CRM Architecture – Platform

- Platform Components
  - IIS 7.0
- Integration points
  - Web Services
    - Metadata service
    - CRMService
  - Plugins
    - Register assemblies directly in the eventing pipeline
    - Reference Microsoft.Crm.Sdk.dll
  - Workflow

**workflow is a consumer of the CRM platform as well

Microsoft | Services

CRM Platform

- Validates all business logic configured in the system
- Manages all metadata
- Manages data storage(CRUD)
- Is the only supported write access into the CRM databases

Microsoft | Services

CRM Server Roles

- Microsoft CRM Server
  - Full Server Role Group
    - Front End Server
    - Back End Server
    - Deployment Administration
  - Front End Server Group
  - Back End Server Group
  - Deployment Administration Server Group

Microsoft | Services

CRM Server Deployment Options

- All roles on a single server (Full Server Group)
  - Configuration compatible with all license types
- Front End, Back End and Administration roles on separate servers
- Scale out individual server roles
  - Not valid for Workgroup License

Microsoft | Services

CRM Server Management

- Deployment Manager
  - MMC Snapin
  - Used to change deployment settings
  - Must be a member of Deployment Admins
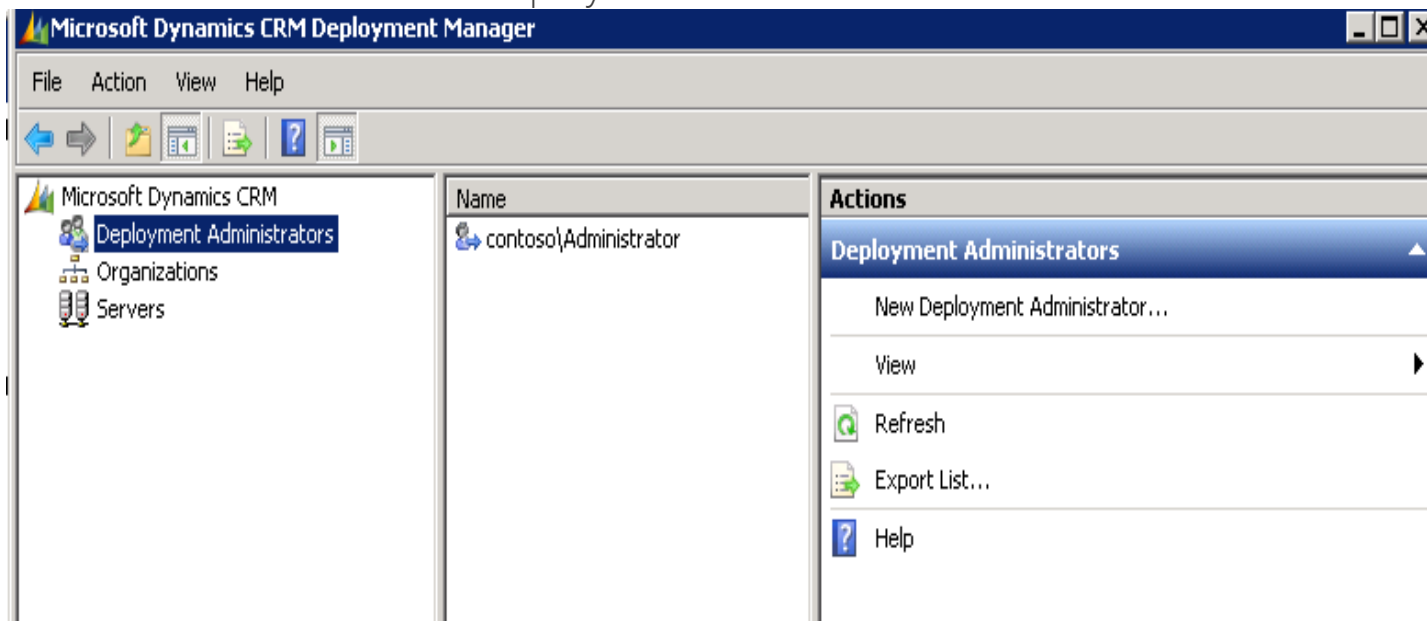
CRM Server Terminology

- Deployment
  - Servers Supporting CRM Organizations
- Organization
  - Stores CRM Data
  - Each organization is in a separate database
- Business Units
  - Allows for the division of data within a given database
- Entities
- Attributes

Active Directory Groups

- Four Active Directory Groups
  - SQLAccess Group
    - All server processes/service accounts that require access to SQL Server; including CRMAppPool identity (domain user or NetworkService). Notice that members of this group have db_owner permission on the Microsoft Dynamics CRM databases
  - PrivUser Group
    - Privileged Microsoft Dynamics CRM user group for special administrative functions; including CRMAppPool identity (domain user or NetworkService). The users who configure Microsoft Dynamics CRM Server must be added to this group.
  - PrivReporting Group
    - Privileged Microsoft Dynamics CRM user group for reporting functions. This group is created during Microsoft Dynamics CRM Server Setup and configured during Microsoft Dynamics CRM Reporting Extensions Setup

Microsoft | Services

Active Directory Groups

- Reporting Group

  – All Microsoft Dynamics CRM users are included in this group.

  – This group is updated automatically as users are added and removed from Microsoft Dynamics CRM. By default, all Microsoft Dynamics CRM Reporting Services reports grant Browse permission to this group. Microsoft Dynamics CRM users that are not members of this group cannot use the reporting feature in the application.

- One Set of AD Groups per <u>Deployment</u>

  - Multiple orgs use the same groups to control access to the deployment. The CRM user accounts and assigned user roles determine data visibility and privileges

Microsoft | Services

Active Directory & CRM

- CRM Access is controlled initially by the users SID or UPN (only if using claims)
- Group membership is checked using GC:// queries
  - Queried from most available GC (retrieved from DNS)
  - Checked during CRM Login and some platform operations
- Controls ability to access CRM
  - Users role determines if the user can login
  - User role also determines available data to report on
    - Either through CRM reports or the FilteredViews
- Security Model White Paper
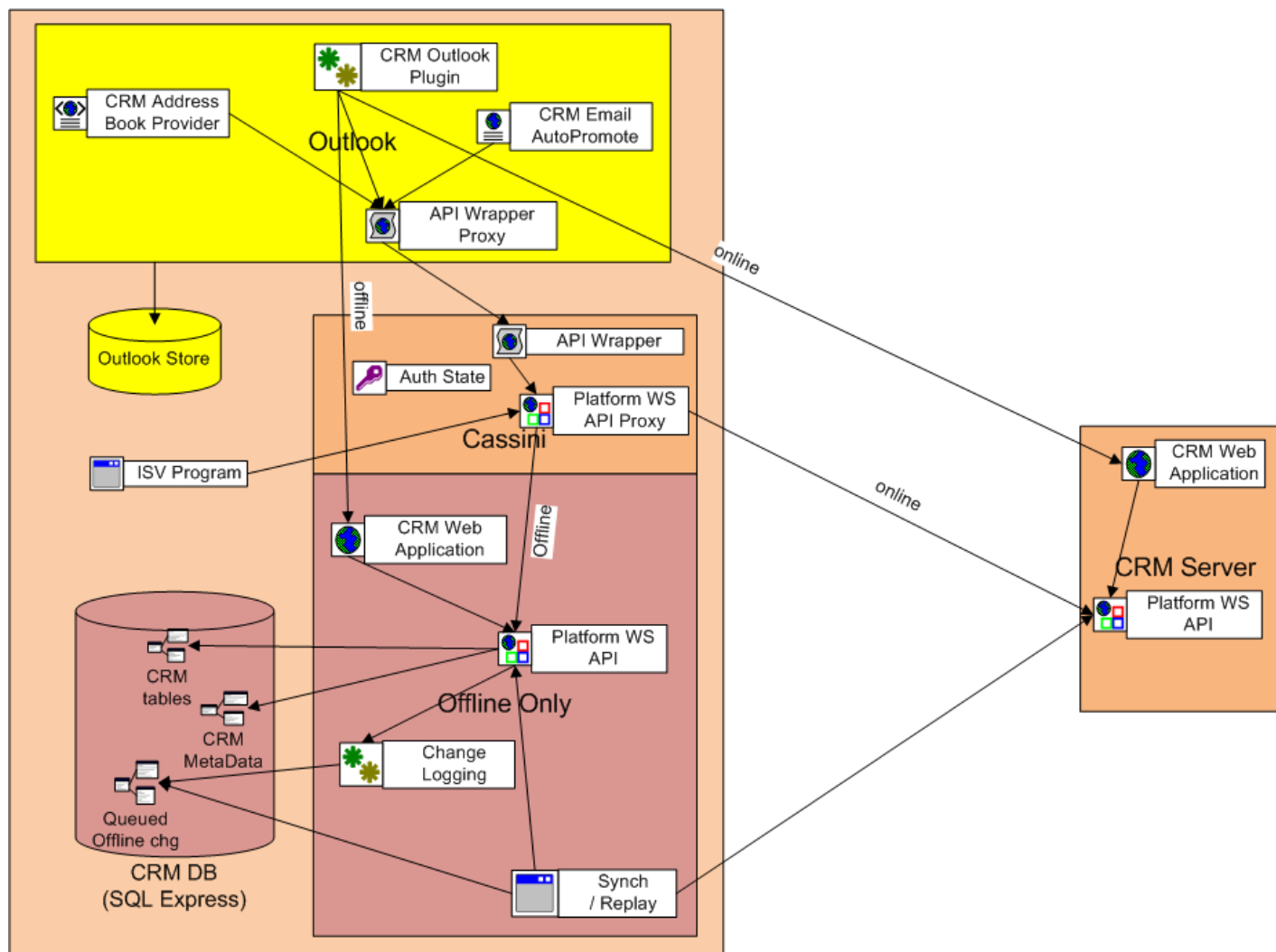 - Bing Search: Microsoft Dynamics CRM Security Model

CRM Component Architecture
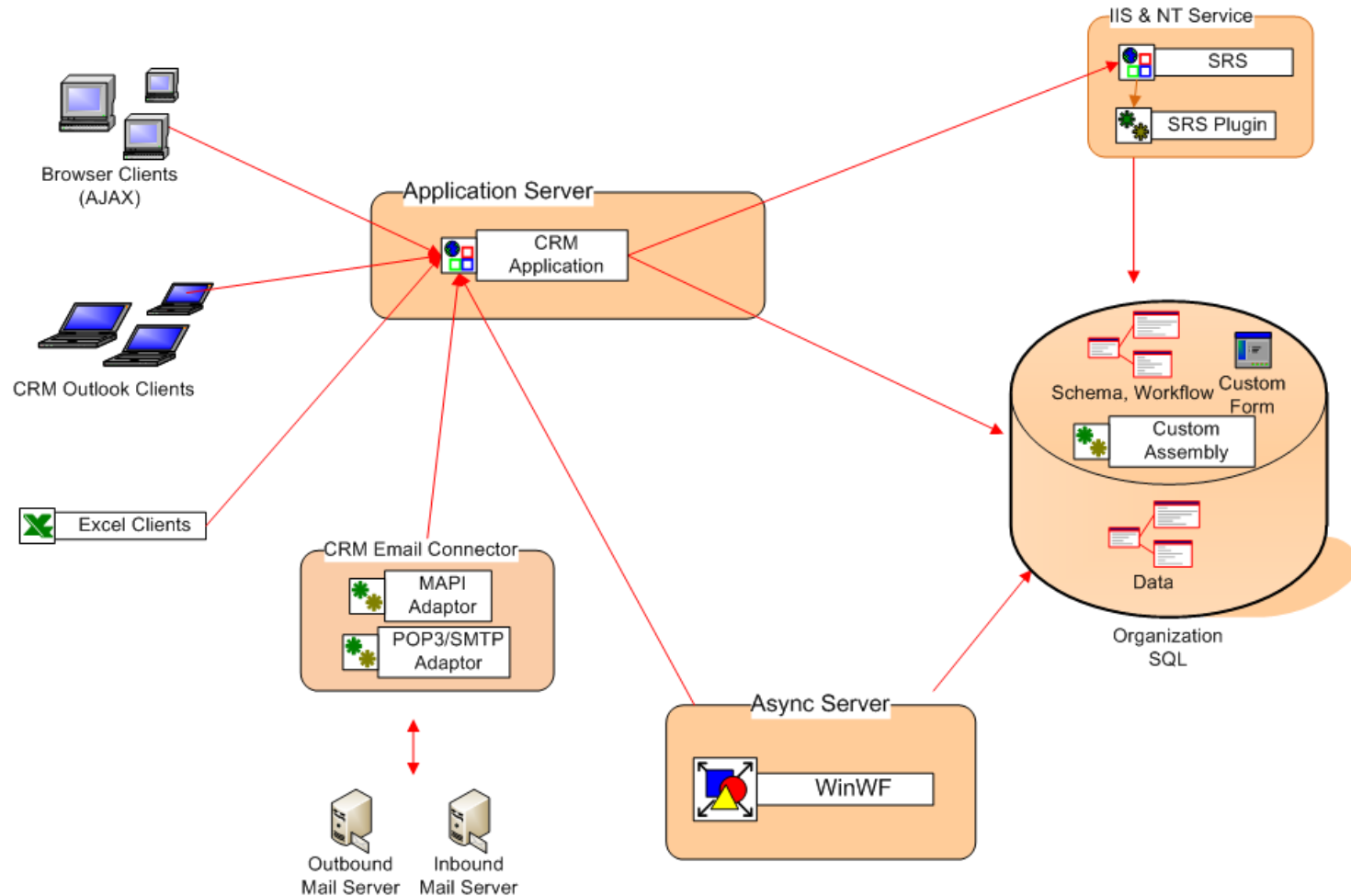
CRM AD Authentication
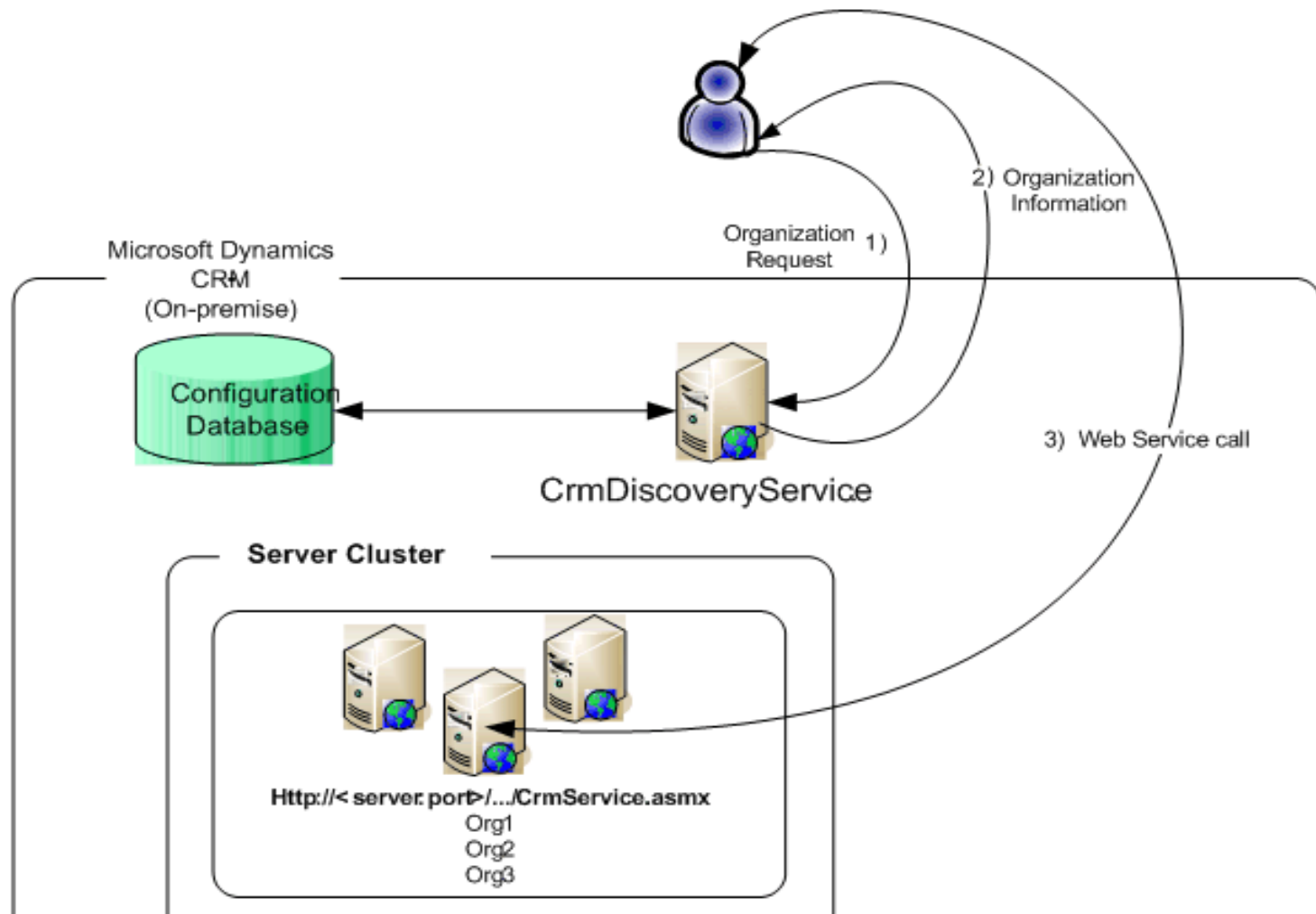
CRM Outlook Client Architecture

Microsoft | Services

Microsoft | Services

Database Structure & Architecture

Database Structure

- MSCRM_Config
  - One MSCRM_Config database per deployment
  - Contains deployment wide information
- <Organization>_MSCRM
  - One <Organization>_MSCRM database per Organization
  - Multiple organization databases can use the same MSCRM_Config database

Microsoft | Services

Database Structure (cont.)

- Tables
  - Each entity has slightly de-normalized view used by the CRM platform (ie: account, contact, etc)
  - Each view is made up of joins between base tables
  - Base tables contain the raw data
- Filtered Views
  - Very de-normalized view designed for reporting
    - Exposes the name and ID of records, picklist values as well as labels, etc
  - Each view is made up of joins between base tables
  - Each view will only show data a user has access to via their role – the user will only see data that they would see in the CRM UI

Microsoft | Services

Database Structure (cont.)

- Most server configuration registry keys moved to the MSCRM_Config database
  - Organization specific keys

Microsoft | Services

CRM Database Performance & Scaling

- Scaling your CRM configuration
    - Organization & Config databases may be on the same or on independent SQL Servers
- SQL 2008 White Paper
    - Covers supportability and cost/benefits of:
        - Sparse columns
        - Compression (Page / Row)
        - Indexes
    - Bing Search: Improving CRM Performance 2008
- Supported high availability configurations
    - Mirroring
    - Active/Passive clustering
    - Log shipping

CRM Database Performance & Scaling Cont.

- Performance tweaks / tuning
  - Custom indexes
    - Either manually tune or using DTA
    - Carefully test, document, then implement
    - Should be done to each custom entity if slow perf is experienced
  - Tempdb – split into 1 data file per ¼ to ½ CPU core
  - Disks
    - RAID 10 is a good option for either local or fiber attached storage
    - Dedicated disks if possible

Microsoft | Services

CRM Database Performance & Scaling Cont.

- Performance tweaks / tuning continued:
  - Enable Read Committed Snapshot isolation (RCSI)
  - Install latest Update Rollup for performance updates
  - Use Fetch based reports
  - Use NoLock hints in SQL based reports
  - Monitor SQL & CRM servers for performance
    - SQL is the heart of CRM, slow SQL = slow CRM
  - Utilize CRM performance toolkit or a custom VSTF monitoring, testing, and base lining
    - Bing Search: CRM Performance Toolkit

Microsoft | Services

CRM Database Supportability

- General rule
  - No direct deletes, inserts, or updates
    - Platform manages the data, if data is modified outside of the logic in the platform data may be damaged
  - Avoid selecting data directly from base tables or platform views
    - These views do not implement CRM security
    - Users will not have access to these views by default

Microsoft | Services

CRM Roles and Privileges

Roles and Business Units

- The Organization and Business Unit (BU) Hierarchy
- CRM records are all user owned by default and therefore exist in the BU of the owning user
- CRM 2011 now includes Team ownership

Access Levels

- None: Always denies the privilege to the user
- User: Grants privilege to the user for records they create, own, or have been shared to them
- Business Unit: Grants privilege for records owned by the user or by users within their Business Unit
- Parent: Child Business Units: Grants the privilege for records with ownership in the user's business unit in addition to records owned in a child Business unit
- Organization: Grants privilege for all records in the organization

Microsoft | Services

Privileges

- Entity:
  - Create, Read, Write, Delete, etc.
- Miscellaneous Privileges:
  - Over 480 different privileges available
  - Go Offline, Print, Assign, Go Mobile, Mail Merge, etc.
  - Bing Search: Dynamics CRM Security Roles and Privileges

Microsoft | Services

Sharing & Teams

- Why Share?
  - No Role and Privilege setup will accommodate everyone seeing everything they need to
  - Instead of creating many roles sharing might be the better option
- Sharing Rules
  - A user must have READ access on the entity to have it shared with them
  - The user that is doing the sharing can only share privileges they have
- Teams
  - Under the Administration and Setting area
  - One Team created per Business Unit

Additional Info

- SDK is a good resource that can give good detail on what privileges are needed to do certain actions
  - Search: Privileges by Message
- If a role has no read access to Accounts then Accounts are not visible in the application

Good Resources

- CRM 2011 SDK
  - Privileges by Message section outlines specific privileges needed for certain actions
  - Ex: Delete Account – Needs the following
    - prvAppendToImportMap prvCreateAccount
    - prvCreateImportMap
    - prvCreateService
    - prvDeleteAccount
    - prvDeleteAsyncOperation
    - prvReadAsyncOperation
    - prvReadAttribute
    - prvReadEntity
    - prvReadOrganization
    - prvReadRelationship
    - prvReadService
    - prvReadUser
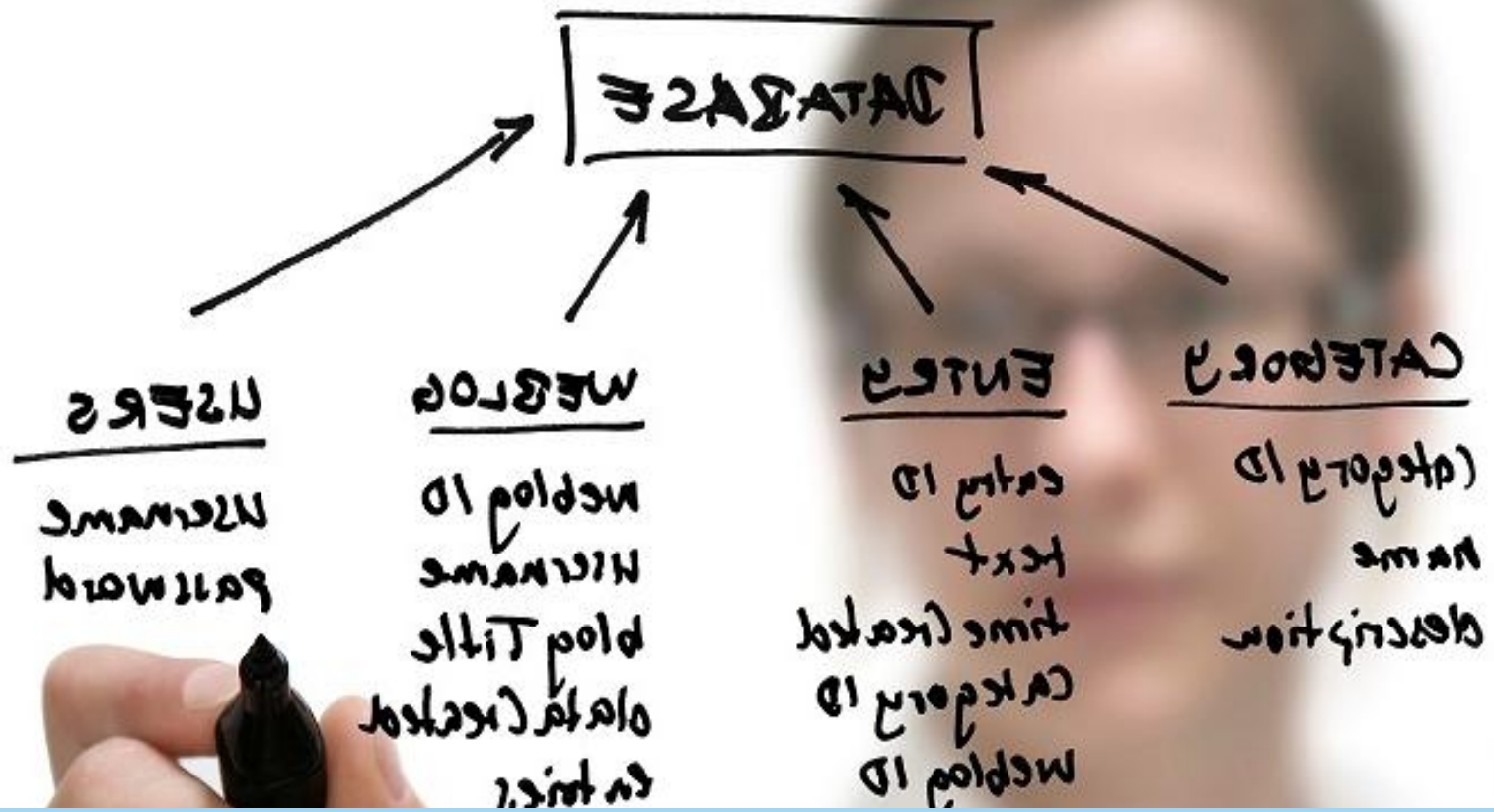   - prvWriteAsyncOperation

Microsoft | Services

Good Resources

- Beta Implementation Guide

  - http://go.microsoft.com/fwlink/?LinkID=200050

- Online SDK available in addition to downloadable version:

  - CRM 2011 SDK: http://go.microsoft.com/fwlink/?LinkID=200082

Microsoft | Services

Summary

- Dynamics CRM Architecture Overview
- Database Structure & Architecture
- Performance
- CRM Roles and Privileges

Questions?