University of Dar es Salaam

Computing Centre

Technical Management of ICT Infrastructure (TM ICTI)

Module 2: Corporate Domain Controller

Module Objectives

1. Simplified administration and resource management
2. Increased network security and
3. single sign-on for users
4. Interoperability
5. reduce administration costs

Module Outline

1. Introduction
2. Distributed Systems
3. Domain Controller

Introduction

Motivation: Resource Sharing

1. Hardware: Storage, connectivity, computation, printing
2. Software:
3. Data

Distributed Systems

Characteristics of distributed systems

1. Multiple servers in computer networks
2. Multiple servers in a distributed system
3. Distributed resources (DB)
4. Distributed systems paradigm

Distributed Systems

Characteristics of distributed systems

Services – oriented architecture (rather than components–oriented architecture)

1. Users requesting services, not connecting to components
2. Transparent locations of resources
3. Transparent locations of service providers
4. Request brokers
5. Generic platforms (“middleware”) e.g web services

Distributed Systems

Implications for security

Specific problems and threats	**Implications for Security**	**Specific solutions in open distributed systems**
Transparent locations of resources	security administration	Mutual recognition of crypto algorithms
Transparent locations of service providers	security policies	Negotiation of crypto technologies and policies
Request brokers	synchronization and coordination of security profiles	Synchronization / recognition of security policies
Generic platforms (“middleware”)	design and usage of generic secure objects	• Dynamic protocols for exchange of security parameters • New authentication and authorization protocols • Protocols for cooperation of mutually suspicious users

Distributed Systems

Security standards

1. Cryptographic
    1. data integrity
    2. Encryption
        1. symmetric key
        2. public key
    3. digital signature
    4. access control

Security standards

Directory standard
1. X.500
2. LDAP

Certification Standards
1. X.509 PKIX

Smart Cards Standards
1. ISO
2. FIPS 201
3. JavaCard

Secure transactions standards
1. SSL security
2. Secure E-mail / SMIME

Distributed Systems

Areas of Considerations

1. Registration in Distributed Systems (IDMS)
   - ✓ X.500
   - ✓ Smartcards
2. Certification Distributed Systems (PKI)
   - ✓ Certification Authority
3. Authentication protocols Distributed Systems (SSO)
   - ✓ SASL
4. Authorization schemes Distributed Systems
   - ✓ ID based
   - ✓ Role based
5. Authenticated transactions in computer network
   - ✓ Single signer – Single recipient
   - ✓ Multiple signer – Multiple recipents

Domain Controller

Introduction

- A network server which holds a directory database that manages user access to a network, which includes authentication, and access control to the network resources.
- Samba is software that can be run on a platform other than Microsoft Windows and allows hosts to interact with a Microsoft Windows client or server
- Samba is also used for file and print sharing

Domain Controller

Planning and Design

1. Determine your Domain Controller Project goals
    - Simplified administration and resource management
    - Increased network security and single sign-on for users
    - Interoperability with other services
    - Features that reduce administration costs, increase security, and provide additional functionality

Domain Controller

Planning and Design

2. Determine your Domain Controller design and deployment strategy
   - varies according to your existing network configuration

Domain Controller

Planning and Design

3. Designing the Logical Structure
   - determines how directory objects are organized
   - provides an effective method for managing your network accounts and shared resources
   - determine the number of forests requiresd
   - create designs for domains, DNS, and organizational units.

Domain Controller

Planning and Design

4. Designing the Site Topology

- The site topology is a logical representation of your physical network
- It contains information about the location of domain controller sites, the domain controllers within each site, and the site links that support domain controller replication between sites.
- The site topology helps you efficiently route client queries and DC replication traffic

Domain Controller

Planning and Design

5. Planning Domain Controller Capacity

- Determine the appropriate number of domain controllers to place in each site.
- Estimating the hardware requirements for each domain controller to minimize cost and maintain an effective service level
- Collecting Site Topology Design Information
- Assessing Disk Space and Memory Requirements
- Monitoring Domain Controller Performance

Domain Controller

Planning and Design

6. Determine software requirements
- Samba
- Operating System

Domain Controller

Deployment

See case study 2

Domain Controller

Operations and Support

Provides the day-to-day technical supervision of the ICT infrastructure.

- Task management
- Backup and Restoration,
- System Monitoring/Management,
- Storage Monitoring/Management

End of Module 2