

# Windows Server - Enterprise PKI Deployment

Course code: GOC173

This instructor led course provides students with advanced theoretical knowledge and practical experience in designing, deploying, operating and troubleshooting PKI on Windows platform. The first part of the training provides recapitulation of public key cryptography principles and the cryptographic and security properties of various algorithms and technologies, such as RSA, DSA, AES, DH, EC-DH, EC-DSA, 3-DES, SHA-1, SHA2 (SHA-256, SHA-384, SHA-512), MD5 and others - not only from the security point of view, but also in regard to their compatibility over wide range of systems starting with Windows 2000 and going through XP, 2003, 7, 2008 R2 and Windows 10 or Windows 2019. The larger part of the training brings deep practical experience with installing, configuring and operating complex hierarchies of AD CS servers. Students will define certification policies (certificate templates), deploy certificates manually as well as automatically (autoenrollment) and will also troubleshoot the deployment and key and certificate lifecycle, implement key backup and recovery and manage CA lifecycle. The course is taught by trainers who are certified on Microsoft Certified Master Directory Services (MCM: Directory).

## At course completion students will be able

- Understand detailed differences between various properties of cryptographic algorithms currently in use
- Assess differences between hash algorithms MD4, MD5, SHA-1, SHA2 (SHA-256, SHA-384 and SHA-512) and their combinations with public key schemes such as RSA, DSA, ECDSA as well as symmetric algorithms such as AES and 3DES
- Know about precise support conditions and compatibility problems among the algorithms (not)available in Windows 2012 and older
- Understand SSL/TLS protocol, its versions and available algorithm suites and their compatibility
- Plan and install AD CS certification authorities in the most secure yet flexible manner
- Manage CA and certificate and private key lifecycle, their protection, backup and restore and decommission

## Prerequisites

- Knowledge in extent of the courses which are listed in the bellow sections **Previous Courses** and **Related Courses**
- Good understanding of Active Directory and Group Policy
- Good understanding of TCP/IP and DNS technologies

## Course outline

- Recapitulation of basic cryptographic terms
- Public key cryptography, Symmetric algorithms, Hashes and their comparison
- MD4, MD5, SHA-1, SHA2 (SHA-256, SHA-384, SHA-512), RSA, DSA, ECDSA, DH, ECDH, AES, 3-DES and DES, Suite-B
- Comparable algorithm strength and algorithm compatibility in Windows family of systems
- CSP and CNG providers and libraries, application and Windows support in Windows 2012 and older
- SSL and TLS protocols and versions, algorithm suites and their compatibility
- Digital certificate and their contents
- Subject, Issuer, Serial Number, SAN, EKU, AIA, CDP, thumbprint, alternate signature format
- Certification Authorities, certificate chains and their validation and trust
- CA versioning, certificate and CA renewal and decommission or revocation
- Prerequisites to install AD CS certification authority

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# Windows Server - Enterprise PKI Deployment

Installing AD CS offline root CA and issuing subordinate CA

AD CS integration with Active Directory and administrative role separation

Certification policies, certificate templates and their versions, CSP and CNG templates

Certificate template parameters and security

Autoenrollment, manual enrollment, renewal and enrollment agents

Certificate requirements for server applications such as SSL/TLS servers, SQL, DC, RDS/TS, LDAPS, System Center, Reporting Services, Exchange, SharePoint, UAG

Certificate requirements for client applications such as smart card Kerberos PKINIT logon, IPSec, SSL/TLS logon, EFS

Digital signatures and encryption for email, files, documents and scripts

Certificate revocation, CRL and OCSP

Certificate and private key lifecycle, private key storage, archival, backup and recovery

Certification authority lifecycle, renewal, revocation and decommissioning

Designing and building complex enterprise CA chains

## Preparation for Microsoft certification

Most Microsoft certification exams do not require students to attend an official MOC course in order to pass the exam.

This applies to all certifications except for MCM

Official Microsoft MOC courses as well as our own GOC courses are good ways of preparation for Microsoft certifications such as MCP, MTA, MCSA, MCSE or MCM

This does not mean that official MOC courses would serve as the only necessary preparation. The primary goal of an MOC course is to provide for sufficient theoretical knowledge and practical experience to effectively work with the related product

MOC courses usually cover most of the topics required by their respective certification exams, but often do not give every topic the same amount of time and emphasis as may be required to completely pass the exam

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