

Exchange Server 2007 Cluster mit Cluster Continuous Replication (CCR)

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Agenda

- Exchange Server 2007 Grundlagen
- Exchange Server 2007 Serverrollen
- Exchange 2007 Hochverfügbarkeitskonzepte
- Clustergrundlagen
- LCR (Local Continuous Replication)
- SCC (Single Copy Cluster)
- CCR (Cluster Continuous Replication)
- Clusterarten
- Windows Cluster Konfiguration + File Share Witness
- Exchange Cluster Installation
- EXBPA
- Failover + Failback
- Tools

Exchange Server 2007 Grundlagen

- Performance Erweiterungen
- 64 Bit, Pagesize von 4 auf 8 KB
- Active Directory Standort Integration
- Keine Routinggruppen mehr
- Routing basiert auf Active Directory Standorten
- Minimierung des Netzwerk Traffics
- Exchange 2007 routet mit der Anzahl minimaler Hops
- Jede Active Directory Site ist ein Hop
- Der Bridgehead Server expandiert die Verteilerlisten, führt Active Directory Abfragen durch und löst Empfänger gegen das Active Directory auf.
- Der Bridgehead Server ist "Site Aware" und kommuniziert mit einem DC in der Site
- Ein Exchange 2007 Bridgehead Server ist in der Lage eine Nachrichtenkonvertierung basierend auf dem originalen Mailinhalt und dem Zielsystem durchzuführen
- Verfügbarkeit - Der Nachrichtenfluss zwischen mehreren E-Mail Servern und Bridgeheadservern wird automatisch Load Balanced
- Automatisches Failover bei Ausfall eines Bridgeheadservers
- Service Discovery Remote Benutzer nutzen Service Discovery um automatisch einen Server mit der Client Access Server Rolle zu finden, welcher die entsprechenden Dienste anbietet

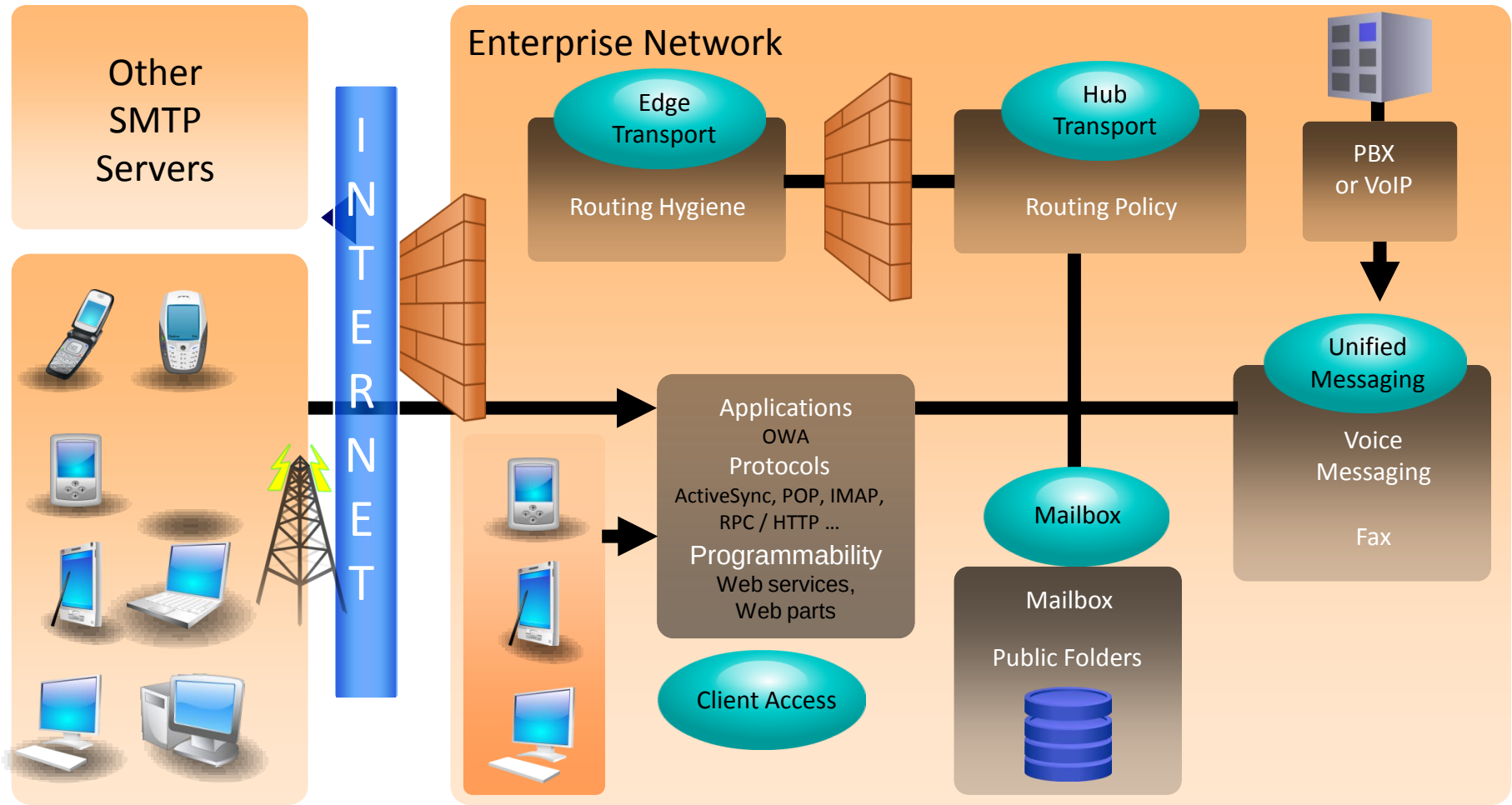
Exchange Server 2007 Grundlagen

- ◆ Rollen basierte Exchange Server Installationen
- ◆ 50 Speichergruppen
- ◆ 50 Datenbanken (maximal pro Server)
- ◆ Pagesize vergrößert von 4 KB auf 8 KB
- ◆ Kommandozeilensupport – “Monad” - PowerShell
- ◆ Keine STM Dateien mehr
- ◆ Maximal 2 Billionen Logfiles
- ◆ 14 Tage “Dumpster”
- ◆ Local Continuous Replication (LCR)
- ◆ Cluster Continuous Replication (CCR)
- ◆ Outlook Voice Access
- ◆ Nur 64 bit (32 Bit zu Testzwecken)
- ◆ Kein Active/Active Cluster
- ◆ Kein OMA / NNTP mehr

Exchange Server 2007 Serverrollen

- Mailbox Server
- Client Access Server
- Hub Transport Server
- Unified Messaging Server
- Edge Transport Server

Serverrollen

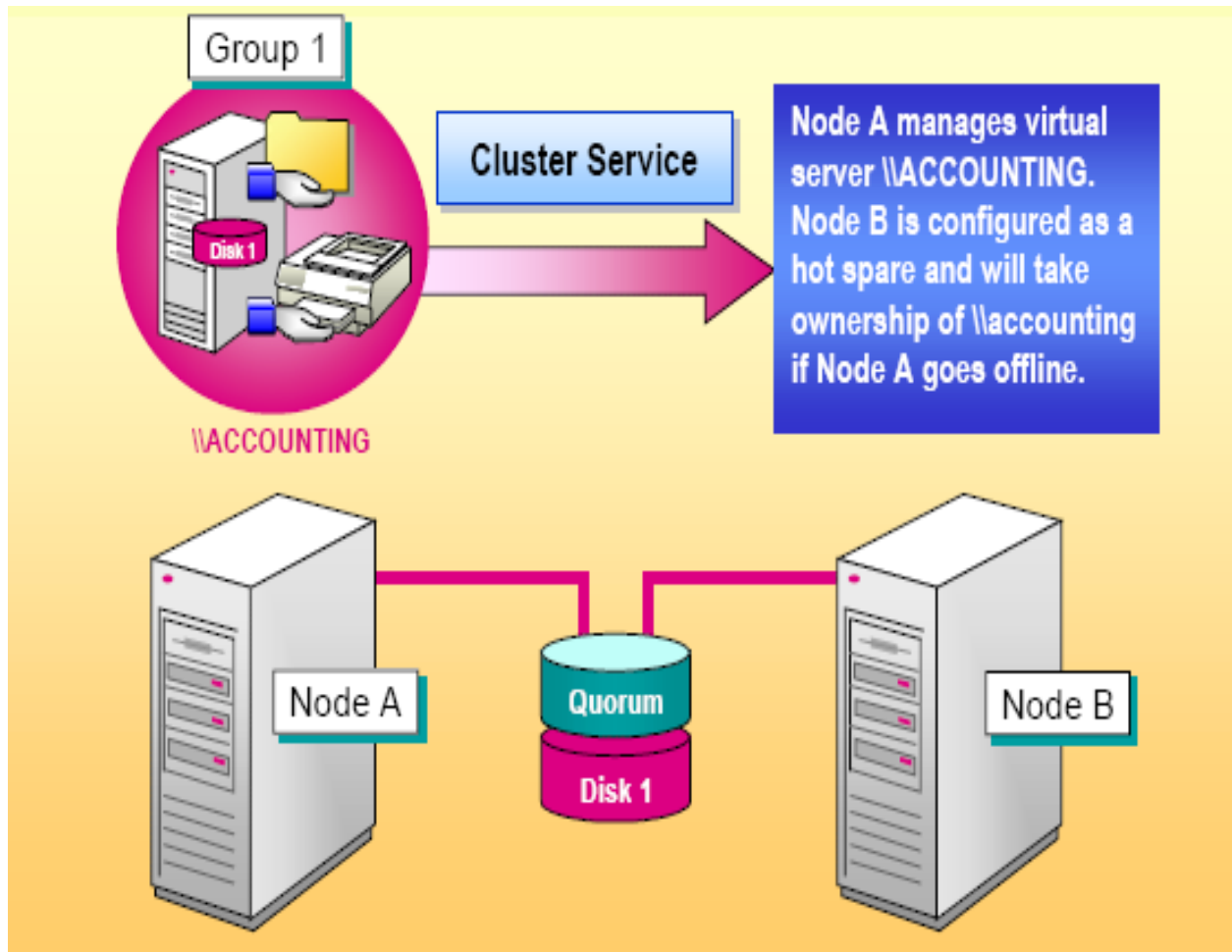


Clustergrundlagen

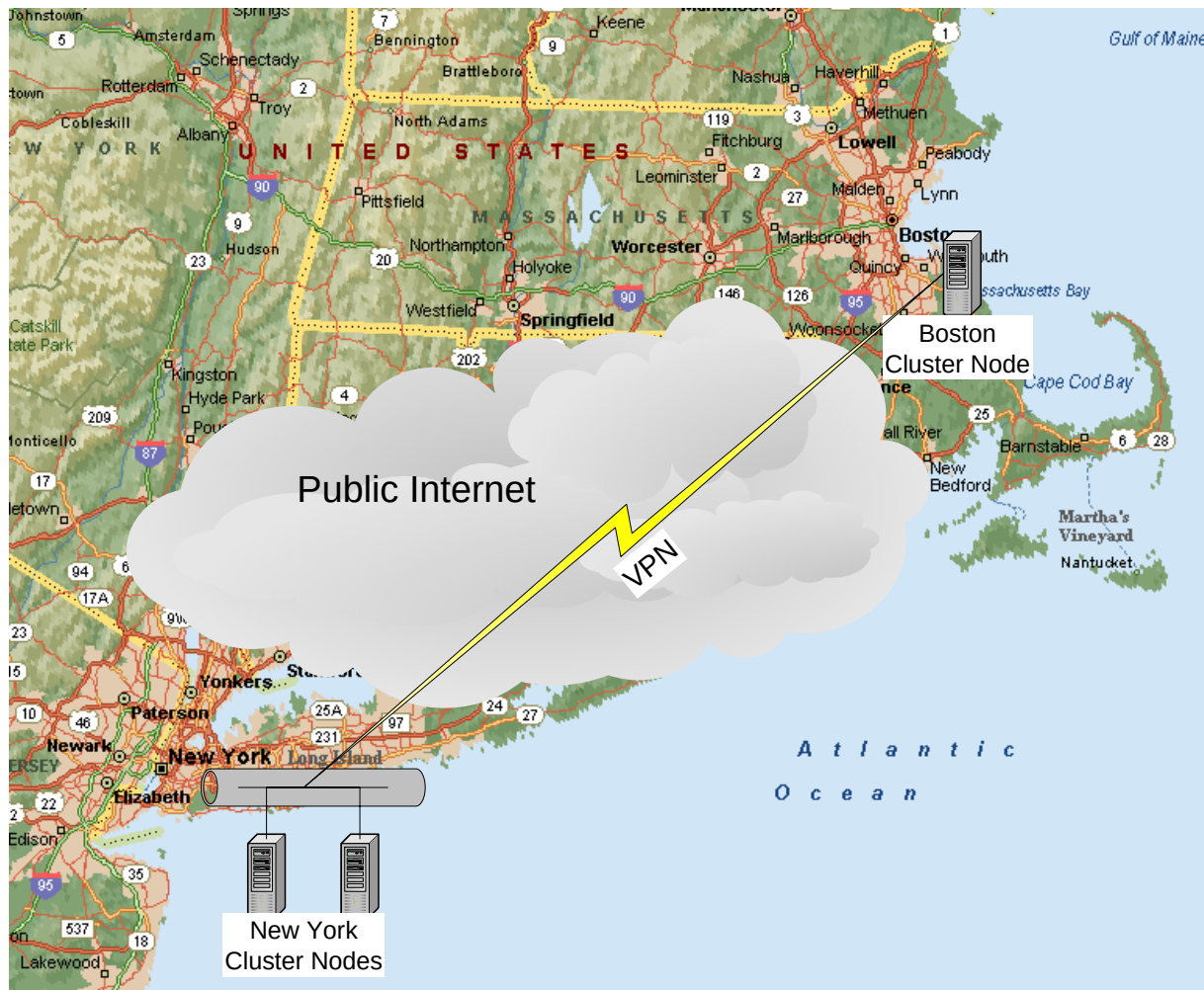
- Ein Cluster, von engl. cluster = Traube, Bündel, Schwarm, genannt, bezeichnet eine Anzahl von vernetzten Computern, die zur parallelen Abarbeitung von zu einer Aufgabe gehörigen Teilaufgaben zur Verfügung stehen. Im Gegensatz zu Parallelrechnern findet die Lastverteilung auf der Ebene einzelner Prozesse statt, die auf einer oder verschiedenen Maschinen des Clusters gestartet werden. Man benötigt also keine parallelisierte Software oder spezielle Betriebssysteme. Alternativ werden Cluster auch zum Steigern der Verfügbarkeit von Systemen genutzt

Quelle: <http://de.wikipedia.org/wiki/Computercluster>

Active / Passive Cluster



Geo Cluster



Anzahl Clusterknoten

Windows Server 2003

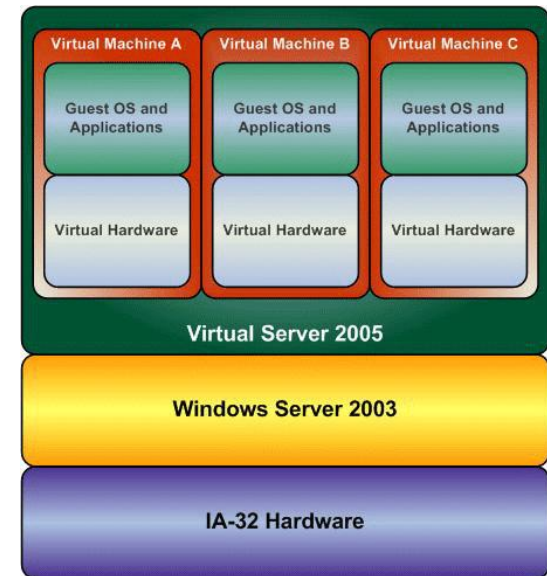
- Windows Server 2003 Enterprise und Windows Server 2003 Datacenter unterstützen maximal 8 Clusterknoten
- Keine Clusterunterstützung für Windows Server 2003 Web Edition und Windows Server 2003 Standard

Windows 2000 Server

- Windows 2000 Advanced Server 2 Clusterknoten und Windows 2000 Datacenter Server 4 Clusterknoten
- Keine Clusterunterstützung für Windows 2000 Server Standard

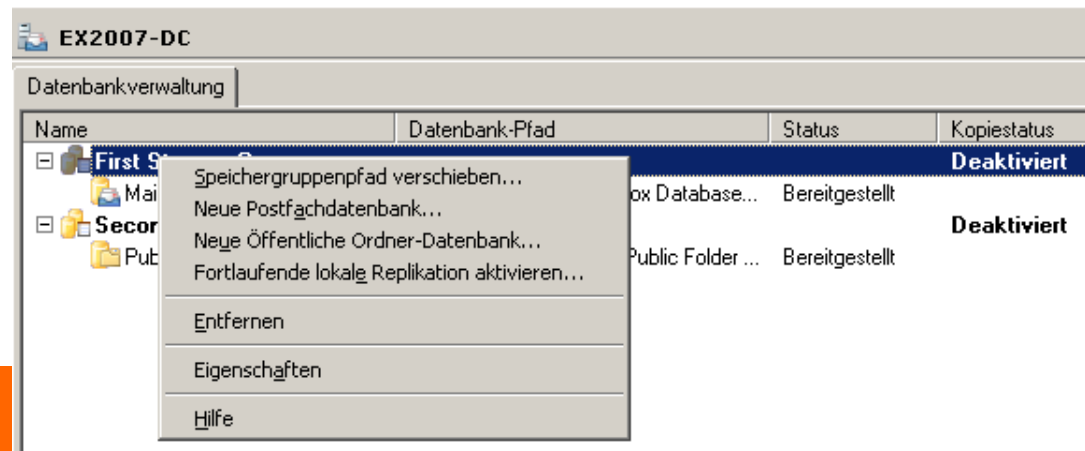
Virtual Server 2005 R2 Sp1

- Kostenlose Virtualisierungssoftware von Microsoft
- Emuliert einen kompletten PC/Server
- Erhältlich als Enterprise Version
- Scriptingfähig
- Ressourcenbegrenzung möglich
- Weboberfläche
- Das Produkt stammt ehemals von Connectix
- Kleiner Bruder ist der Microsoft Virtual PC
- Mitbewerber VMware
 - VMware Workstation
 - VMware Server (kostenlos) – Vergleichbar mit MS Virtual Server
 - VMware ESX Server – Eigenes Betriebssystem / Dateisystem – Enterprise Einsatz



Local Continuous Replication (LCR)

- Lokale Kopie einer Postfach-Datenbank mit Transaktionsreplikation
- Kein Ersatz für ein Backup
- iSCSI, SAN möglich
- Kein LCR für öffentliche Ordner
- Kein UNC Pfad



Local Continuous Replication (LCR)

Fortlaufende lokale Replikation von Speichergruppen aktivieren

☒ Einführung
☐ Pfad festlegen
☐ Mailbox Database
☐ Aktivieren
☐ Fertigstellung

Einführung
 Wenn für diese Speichergruppe die fortlaufende lokale Replikation aktiviert ist, wird eine zweite Kopie der in dieser Speichergruppe enthaltenen Datenbank erstellt und automatisch an den angegebenen Speicherorten gespeichert. Dies kann in bestimmten Wiederherstellungssituationen hilfreich sein, obwohl hierbei zusätzlicher Speicherplatz erforderlich ist, um die Daten der fortlaufenden lokalen Replikation aufzunehmen.

Die folgende Speichergruppe und Datenbank werden für die fortlaufende lokale Replikation konfiguriert:

Name der Speichergruppe:

Datenbanknamen:

Hilfe

Fortlaufende lokale Replikation von Speichergruppen aktivieren

☒ Einführung
☒ Pfad festlegen
☒ Mailbox Database
☐ Aktivieren
☐ Fertigstellung

Mailbox Database
 Geben Sie den Pfad ein, in dem die Dateien für die fortlaufende lokale Datenbankreplikation der folgenden Datenbank gespeichert werden sollen.

Name der Speichergruppe:

Datenbankname:

Exchange-Datenbank-Dateipfad für fortlaufende lokale Replikation:

Hilfe

Fortlaufende lokale Replikation von Speichergruppen aktivieren

☒ Einführung
☒ Pfad festlegen
☐ Mailbox Database
☐ Aktivieren
☐ Fertigstellung

Pfad festlegen
 Geben Sie den Pfad zu den Dateien für die fortlaufende lokale Replikation der folgenden Speichergruppe ein.

Name der Speichergruppe:

Speicherort für Systemdateien der fortlaufenden lokalen Replikation:

Speicherort für Protokolldateien der fortlaufenden lokalen Replikation:

Hilfe

Fortlaufende lokale Replikation von Speichergruppen aktivieren

☒ Einführung
☒ Pfad festlegen
☒ Mailbox Database
☒ Aktivieren
☐ Fertigstellung

Aktivieren
 Verstrichene Zeit: 00:00:08
 Zusammenfassung: 2 Element(e). Erfolgreich: 1, Fehler: 0.

☒ Mailbox Database

Ausführung eines Exchange-Verwaltungsbefehls abgeschlossen:
 enable-DatabaseCopy -Identity 'EX2007-D0C\First Storage Group\Mailbox Database'
 CopyEdbFilePath 'C:\Programme\Microsoft\Exchange Server\Mailbox\LocalCopies\First Storage Group\Mailbox Database.edb'

Verstrichene Zeit: 00:00:01

☒ First Storage Group

Verstrichene Zeit: 00:00:06

Drücken Sie STRG+C, um den Inhalt dieser Seite zu kopieren.

Hilfe

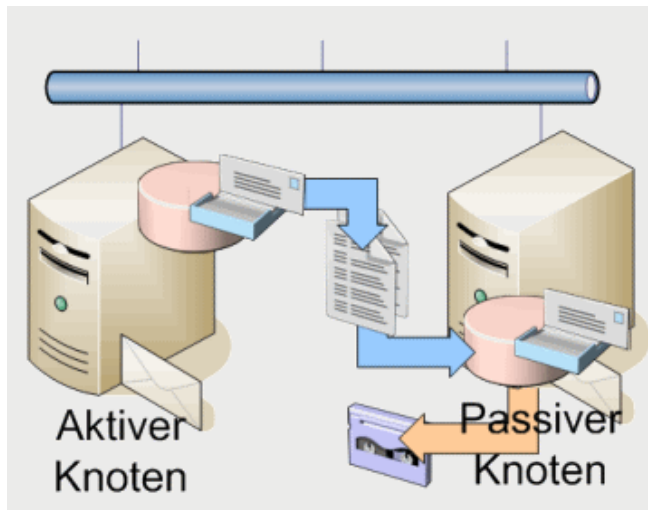
Local Continuous Replication (LCR)

The screenshot displays the Exchange Server 2007-DC interface, specifically the 'Datenbankverwaltung' (Database Management) section. The main window shows a list of databases with columns for Name, Datenbank-Pfad, Status, and Kopiestatus. The 'Kopiestatus' column for the 'First Storage Group' is circled in red, showing 'Fehlerfrei' (Error-free). Below the list, a context menu is open for the 'First Storage Group', with the option 'Fortlaufende lokale Replikation anhalten' (Suspend continuous local replication) circled in red. The status 'Deaktiviert' (Deactivated) is also visible.

The bottom part of the image shows a file explorer window at the path 'C:\Programme\Microsoft\Exchange Server\Mailbox\First Storage Group'. The left pane shows the folder structure, with 'First Storage Group' and 'Local Copies' circled in red. The right pane shows a list of files, including 'CatalogData-8af8c711-d17f-...' and various log files (E00.chk, E00.log, E00000000F4.log, etc.).

Single Copy Cluster (SCC)

- Kein Active/Active Cluster mehr
- Ausschliesslich Active/Passive
- Prinzip wie bei Exchange 2003

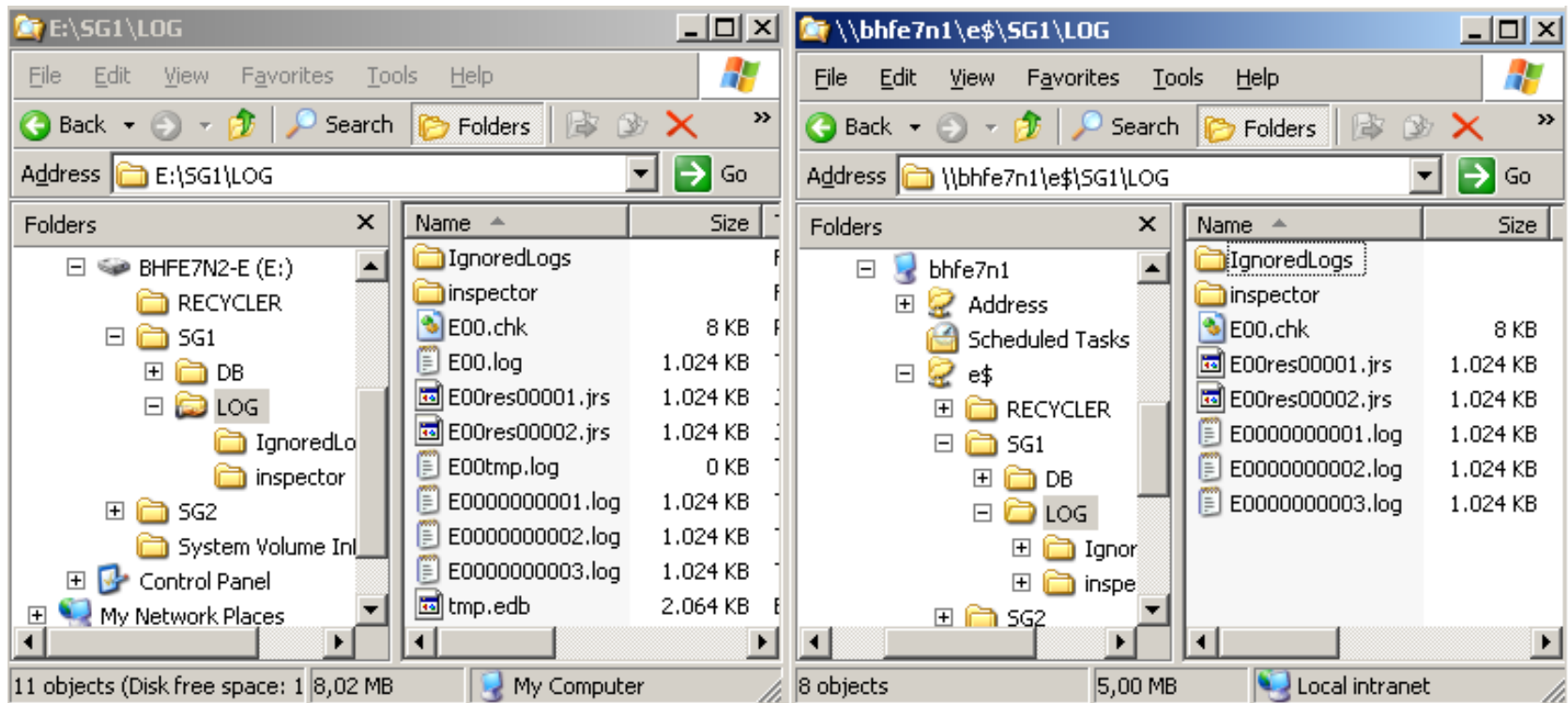


The screenshot shows the 'Exchange Server 2007 Setup' wizard. The 'Cluster Settings' section is active, showing the 'Select cluster type:' options. The 'Single Copy Cluster' option is selected. The 'Specify installation options for this node:' section shows the 'Clustered Mailbox Server Name' as 'MailboxServer', the 'Clustered Mailbox Server IP Address' as '10.10.1.249', and the 'Specify the path for the clustered mailbox server database files:' as 'S:\Program Files\Microsoft\Exchange Server\Mailbox'. The 'Browse...' button is visible next to the path. The 'Help' button is at the bottom left, and the '< Back', 'Next >', and 'Cancel' buttons are at the bottom right.

Cluster Continuous Replication

- Kopie einer Exchange Datenbank auf räumlich getrennten Clusterknoten
- Datenbank wird per Transaktionsreplikation repliziert
- Kein Shared Storage (Quorum) notwendig
- Voraussetzung MNS (Majority Node Set)
- Dritter Rechner als Witness (Zeuge) notwendig
- Im K-Fall minimaler Datenverlust möglich

Cluster Continuous Replication



Cluster Account

- Cluster Account anlegen
- Name = Clusadmin
- Vollständige Exchange Berechtigungen
- Lokale Windows Admin Berechtigungen auf den Cluster Knoten
- Kennwort darf nicht ablaufen

Eigenschaften von Clusadmin

Mitglied von	Einwählen	Umgebung	Sitzungen
Remoteüberwachung	Terminaldienstprofil	COM+	
Allgemein	Adresse	Konto	Profil
Rufnummern	Organisation		

Clusadmin

Vorname: Initialen:

Nachname:

Anzeigename:

Beschreibung:

Büro:

Rufnummer:

E-Mail:

Webseite:

Windows Installation (Cluster)

- Windows 2003 SP1 oder R2
- IIS installieren (kein SMTP/NNTP)
- .NET Framework 2.0
- .NET Hotfix 926776
- Powershell
- MMC 3.0

Cluster Installation

New Server Cluster Wizard

Welcome to the New Server Cluster Wizard

This wizard helps you create a new server cluster. Using this wizard, you specify the computer that will be the first node in the cluster. After you finish the wizard, you can add additional nodes by using Cluster Administrator.

This wizard requires that you specify the following information:

- The cluster's domain
- A cluster name that is unique in the domain
- The name of the first computer in the cluster
- A static IP address
- Logon information for a user account that will be used for the cluster service account

To continue, click Next.

New Server Cluster Wizard

Cluster Name and Domain

Specify the name of the new server cluster and the domain in which it will be created.

Select or type the name of the domain in which the cluster will be created. Only computers in this domain can be members of the cluster.

Domain:
domaine.tld

Type a cluster name that is unique in the domain. This must be a valid computer name.

Cluster name:
CCR-CLUSTER

New Server Cluster Wizard

Select Computer

The computer must be a member of the domain you specified.

Enter the name of the computer that will be the first node in the new cluster.

Computer name:
ex2007-node1

Browse... Advanced

< Back Next > Cancel

Cluster Installation

The image displays three overlapping screenshots of the 'New Server Cluster Wizard' installation window, showing different stages of the setup process.

Top Window: Analyzing Configuration
Please wait while the wizard determines the cluster configuration.

- ✓ Checking for existing cluster
- ✓ Establishing node connection(s)
- ✓ Checking node feasibility
- ⚠ Finding common resources on nodes
 - ✓ ex2007-node1: Collecting managed resources.
 - ✓ ex2007-node1: The following disks will not be
 - ⚠ ex2007-node1: Could not locate a sharable qu
- ⚠ Checking cluster feasibility.

Tasks completed.

View Log...

Click Next to continue. Click Back to change the configuration.

< Back

Bottom Window: IP Address
Enter an IP address that cluster management tools will use to connect to the cluster.

IP Address: 192 . 9 . 200 . 222

< Back

Right Window: Cluster Service Account
Enter login information for the domain account under which the cluster service will be run.

User name: clusadmin

Password: ••••••••

Domain: domaene.tld

i This account will be given local administrative rights on all nodes of this cluster to allow for proper operation.

< Back Next > Cancel

Cluster Installation

The image displays the steps of a Windows Server Cluster installation. It includes the 'New Server Cluster Wizard' showing the proposed configuration, the 'Cluster Configuration Quorum' dialog, the 'Creating the Cluster' progress window, and the final 'Cluster Administrator' console view.

New Server Cluster Wizard - Proposed Cluster Configuration

Verify that you want to create a cluster with the following configuration.

Cluster name: CCR-CLUSTER.domaene.tld

Cluster IP address: 192.9.200.222\255.255.255.0

Cluster network: LAN - Private and Public
Intel 21140-Based PCI Fast
Primary Address: 192.9.200.

Cluster service account credentials
Name: clusadmin
Password: [REDACTED]

Cluster Configuration Quorum: Majority Node Set

To create a cluster with this configuration, click Next.

Cluster Configuration Quorum

Select the resource or resource type that you would like to use for the quorum resource.

Majority Node Set

Creating the Cluster

Please wait while the cluster is configured.

- ✓ Reanalyzing cluster
- ✓ Configure cluster services
- ✓ Configure resource types
- ✓ Configure resources

Tasks completed.

Cluster Administrator - [CCR-CLUSTER (CCR-CLUSTER.domaene.tld)]

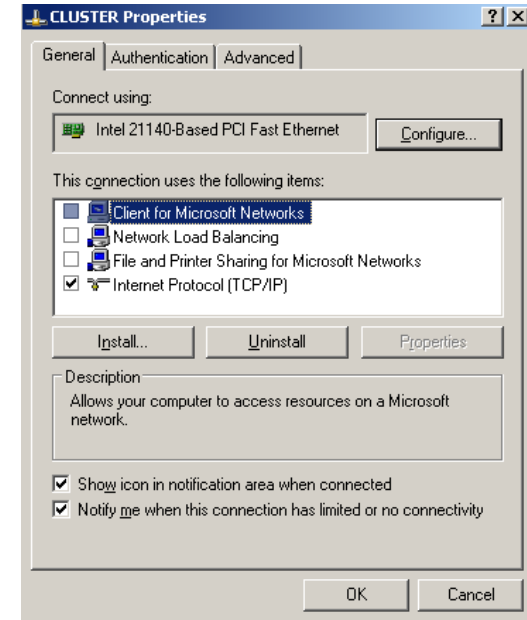
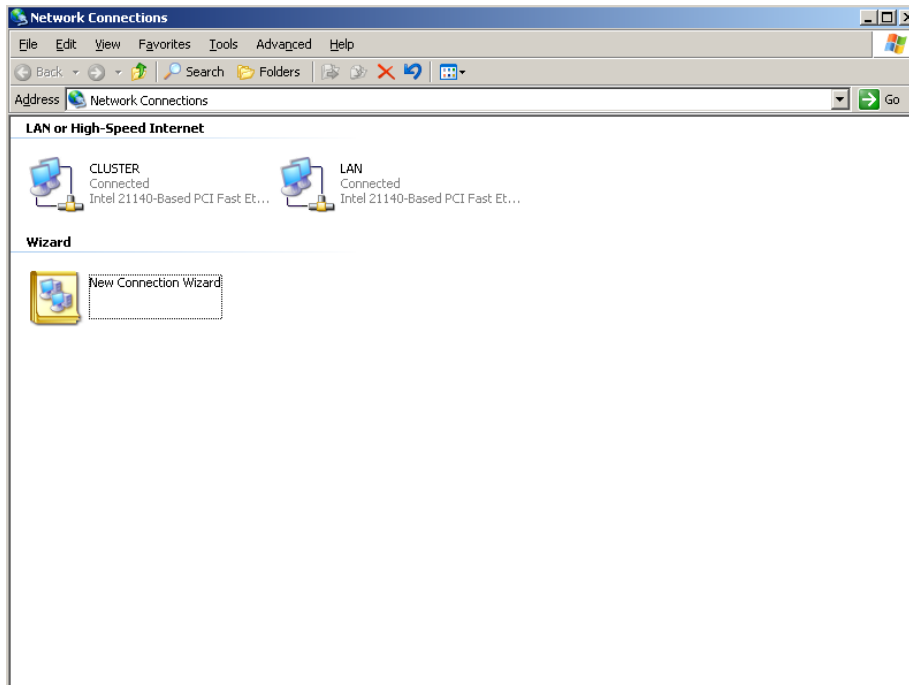
File View Window Help

CCR-CLUSTER

- Groups
 - Cluster Group
- Resources
- Cluster Configuration
- EX2007-NODE1
 - Active Groups
 - Active Resources
 - Network Interfaces

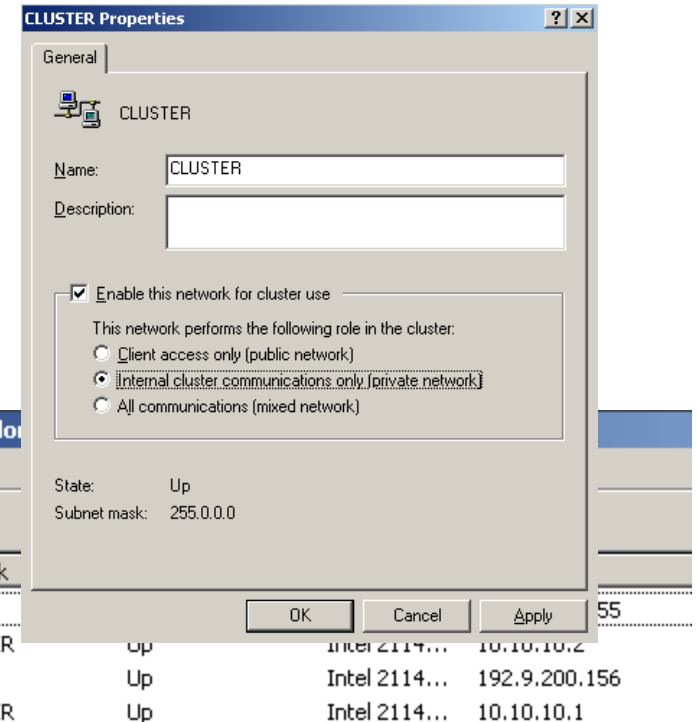
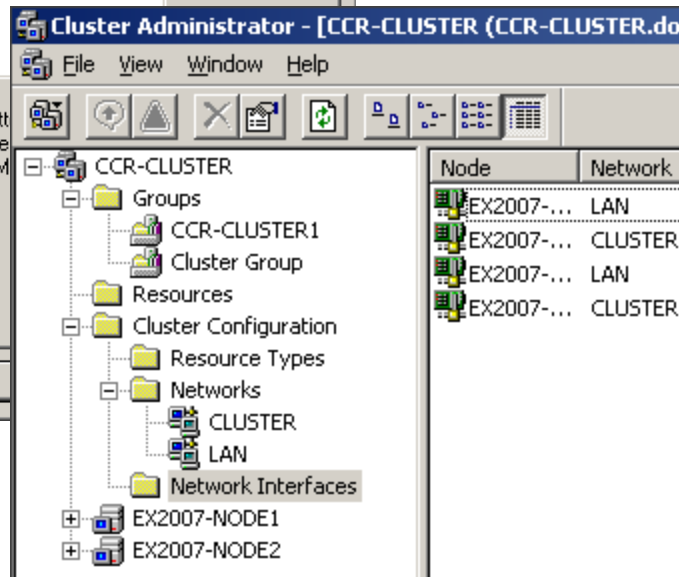
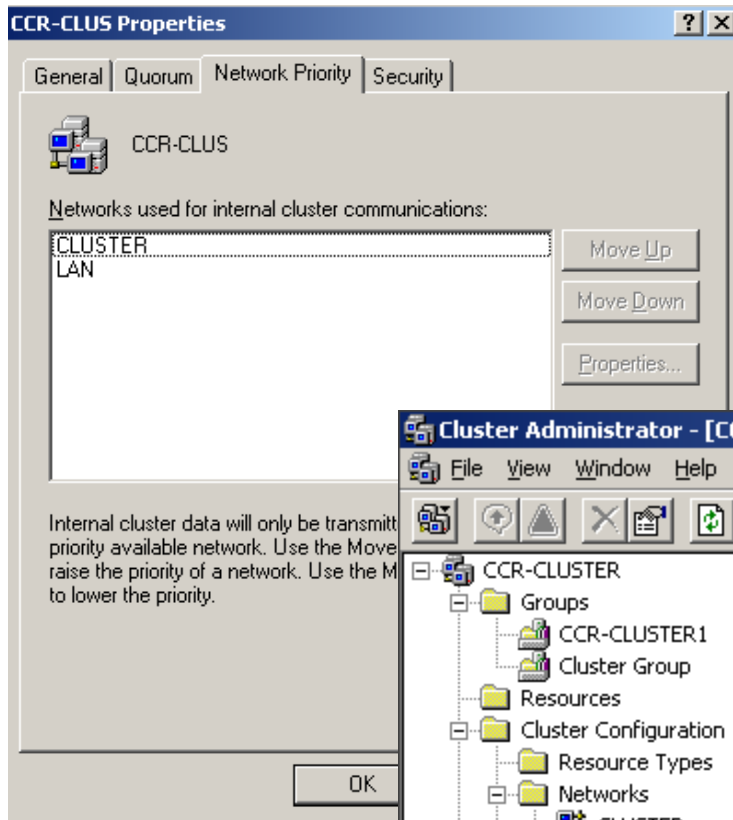
Name	State
Groups	
Resources	
Cluster Configuration	
EX2007-NODE1	Up

Cluster Netzwerkkonfiguration



NetBIOS over TCP/IP deaktivieren –
LAN NIC in der Reihenfolge nach oben

Cluster Netzwerkkonfiguration



Cluster Installation

The image displays two screenshots of the Windows Cluster Administrator console for a cluster named 'CCR-CLUSTER (CCR-CLUSTER.domaene.tld)'.

Left Screenshot: The 'Add Nodes Wizard' is open, showing the 'Cluster Service Account' step. The user name is 'clusadmin', the password is masked with dots, and the domain is 'domaene.tld'. A note indicates: 'This account will be given local administrative rights for proper operation.'

Right Screenshot: The Cluster Administrator console shows the cluster configuration. The left pane lists the hierarchy: CCR-CLUSTER > Groups > Cluster Group > Resources > Cluster Configuration > EX2007-NODE1 > Active Groups > Active Resources > Network Interfaces > EX2007-NODE2. The right pane shows a table of the cluster's state.

Name	State
Groups	
Resources	
Cluster Configuration	
EX2007-NODE1	Up
EX2007-NODE2	Up

Cluster.exe

```

C:\Dokumente und Einstellungen\Administrator.DECUS>cluster /?
Die Syntax dieses Befehls lautet:

CLUSTER /LIST[:Domänenname]

CLUSTER /CHANGEPASS[WORD] /?
CLUSTER /CHANGEPASS[WORD] /HELP
CLUSTER /CLUSTER:Clustername1[,Clustername2[,...]]
        /CHANGEPASS[WORD][:neues Kennwort[,altes Kennwort]] <Optionen>

<Optionen> =
    [/FORCE] [/QUIET] [/SKIPDC] [/TEST] [/VERBOSE] [/UNATTENDED] [/?] [/HELP]

CLUSTER [/CLUSTER:]Clustername <Optionen>

<Optionen> =
    /CREATE [/NODE:Knotenname] [/VERBOSE] [/UNATTENDED] [/MINIMUM]
        /USER:Domäne\Benutzername | Benutzername@Domäne [/PASS[WORD]:Kennwort]
        /IPADDRESS[:xxx.xxx.xxx.xxx[,xxx.xxx.xxx.xxx,Netzwerkverbindungsname]
    /ADD[NODES][:Knotenname[,Knotenname ...]] [/VERBOSE] [/UNATTENDED]
        [/MINIMUM] [/PASSWORD:Dienstkonto-Kennwort]

CLUSTER [/CLUSTER:]Clustername <Optionen>

<Optionen> =
    /CREATE [/NODE:Knotenname] /WIZ[ARD] [/MINIMUM]
        [/USER:Domäne\Benutzername | Benutzername@Domäne] [/PASS[WORD]:Kennwort]
        [/IPADDRESS[:xxx.xxx.xxx.xxx]
    /ADD[NODES][:Knotenname[,Knotenname ...]] /WIZ[ARD] [/MINIMUM]
        [/PASSWORD:Dienstkonto-Kennwort]
    /PROPERTIES[:Eigenschaftsliste]
    /PRIV[PROPERTIES][:Eigenschaftsliste]
    /PROPERTIES[:Eigenschaft[,Eigenschaft ...]] /USEDEFAULT
    /PRIV[PROPERTIES][:Eigenschaft[,Eigenschaft ...]] /USEDEFAULT
    /RENAME:Clustername
    /QUORUM[RESOURCE][:Ressourcename] [/PATH:Pfad] [/MAXLOGSIZE:Max_Größe_KB]
    /SETFAIL[UREACTIONS][:Knotenname[,Knotenname ...]]

```

Cluster Log

CLCfgrSrv.log - Editor

Datei Bearbeiten Format Ansicht ?

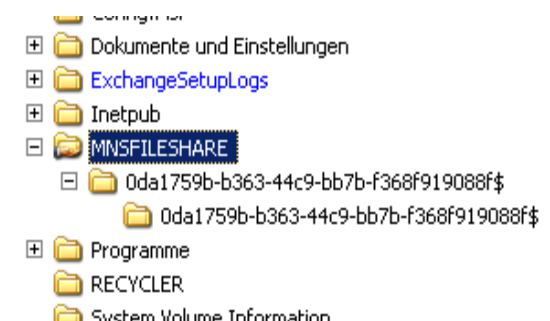
```

2006-02-26 11:27:24.946 [INFO] node2: (null) (hr=00000000, {FDC75680-7DBB-42CA-8003-E4CDB01FF062}, {93C32F99-
2006-02-26 11:27:25.026 [INFO] DECCLUS: (null) (hr=00000000, {FDC75680-7DBB-42CA-8003-E4CDB01FF062}, {036BF567-
2006-02-26 11:27:25.096 [INFO] node2: Clustertauglichkeit des Knotens wird überprüft... (hr=00000000, {CC5E57B1-4520-4672-B4BA-A288EC42946E}, {2F2A800D-
2006-02-26 11:27:25.106 [INFO] node1: Clustertauglichkeit des Knotens wird überprüft... (hr=00000000, {CC5E57B1-4520-4672-B4BA-A288EC42946E}, {2F2A800D-
2006-02-26 11:27:25.176 [INFO] node2: (null) (hr=00000000, {CC5E57B1-4520-4672-B4BA-A288EC42946E}, {2F2A800D-
2006-02-26 11:27:25.236 [INFO] node1: (null) (hr=00000000, {CC5E57B1-4520-4672-B4BA-A288EC42946E}, {2F2A800D-
2006-02-26 11:27:25.336 [INFO] node2: Betriebssystemversion auf diesem Knoten wird überprüft... (hr=00000000,
2006-02-26 11:27:25.477 [INFO] node2: Betriebssystemversion auf diesem Knoten wird überprüft... (hr=00000000,
2006-02-26 11:27:25.597 [INFO] node2: Betriebssystemversion auf diesem Knoten wird überprüft... (hr=00000000,
2006-02-26 11:27:25.667 [INFO] node2: Betriebssystemversion auf diesem Knoten wird überprüft... (hr=00000000,
2006-02-26 11:27:26.128 [INFO] node2: (null) (hr=00000000, {CC5E57B1-4520-4672-B4BA-A288EC42946E}, {2F2A800D-
2006-02-26 11:27:26.198 [INFO] node2: Verwaltete Ressourcen werden gesammelt... (hr=00000000, {036BF567-2377-4672-B4BA-A288EC42946E}, {93C32F99-
2006-02-26 11:27:26.298 [INFO] [SRV] The cluster service is not running. Creating a dummy Local Quorum resou
2006-02-26 11:27:26.388 [INFO] node1: Betriebssystemversion auf diesem Knoten wird überprüft... (hr=00000000,
2006-02-26 11:27:26.739 [INFO] node2: Die folgenden Datenträger werden nicht vom Cluster verwaltet: (hr=00000000,
2006-02-26 11:27:26.799 [INFO] node2: Die folgenden Datenträger werden nicht vom Cluster verwaltet: (hr=00000000,
2006-02-26 11:27:26.869 [INFO] node2: Der physikalische Datenträger '\\.\PHYSICALDRIVE0' ist kein SCSI-Datenträger
2006-02-26 11:27:26.919 [INFO] node2: Der physikalische Datenträger '\\.\PHYSICALDRIVE0' ist kein SCSI-Datenträger
2006-02-26 11:27:26.999 [INFO] node2: Found SCSI disk '\\.\PHYSICALDRIVE1' on Bus '0' and Port '2'; at TID '0
2006-02-26 11:27:27.059 [INFO] node2: Physical disk PHYSICALDRIVE1 has signature 0. (hr=00000000, {05AA0768-5F49-49CD-AFDC-961
2006-02-26 11:27:27.510 [WARN] node2: The physical disk '\\.\PHYSICALDRIVE1' does not have any partitions and
2006-02-26 11:27:27.520 [INFO] node1: Betriebssystemversion auf diesem Knoten wird überprüft... (hr=00000000,
2006-02-26 11:27:27.620 [INFO] [SRV] Didn't find the ManagedDisksonSystemBuses value in the registry. (hr = 0x
2006-02-26 11:27:27.840 [WARN] node2: Physical disk 'PHYSICALDRIVE1' is NOT quorum capable. (hr=0x00000001, {05
2006-02-26 11:27:27.920 [INFO] [SRV] The cluster service is not running. Creating a dummy Majority Node Set i
2006-02-26 11:27:28.211 [INFO] node1: (null) (hr=00000000, {CC5E57B1-4520-4672-B4BA-A288EC42946E}, {2F2A800D-
2006-02-26 11:27:28.261 [INFO] node1: Verwaltete Ressourcen werden gesammelt... (hr=00000000, {036BF567-2377-4672-B4BA-A288EC42946E}, {93C32F99-
2006-02-26 11:27:29.222 [INFO] node1: Die folgenden Datenträger werden nicht vom Cluster verwaltet: (hr=00000000,
2006-02-26 11:27:30.584 [INFO] node1: Der physikalische Datenträger '\\.\PHYSICALDRIVE0' ist kein SCSI-Datenträger
2006-02-26 11:27:34.800 [INFO] node2: Found IP Address '10.10.10.3' with subnet mask '255.0.0.0'. (hr=00000000,
2006-02-26 11:27:34.930 [INFO] node2: Created network adapter 'LAN' (hr=00000000, {05AA0768-5F49-49CD-AFDC-961
2006-02-26 11:27:41.109 [INFO] node2: Found IP Address '192.168.1.3' with subnet mask '255.255.255.0'. (hr=00
2006-02-26 11:27:41.199 [INFO] node2: Created network adapter 'HEARTBEAT' (hr=00000000, {05AA0768-5F49-49CD-AFDC-961
2006-02-26 11:27:43.973 [INFO] node2: (null) (hr=00000000, {FDC75680-7DBB-42CA-8003-E4CDB01FF062}, {6279EE6C-1
2006-02-26 11:27:44.083 [WARN] node2: [SRV] Enumerating resources. Total Requested:10; Current enum index:0;
2006-02-26 11:27:44.174 [WARN] node2: Local quorum 'is not' the quorum device. (hr=0x00000001, {05AA0768-5F49-4
2006-02-26 11:27:44.354 [INFO] node2: Eine quorumtaugliche Ressource "Lokales Quorum" wurde gefunden. (hr=000
2006-02-26 11:27:44.544 [INFO] node2: (null) (hr=00000000, {FDC75680-7DBB-42CA-8003-E4CDB01FF062}, {6279EE6C-1
2006-02-26 11:27:44.664 [INFO] node2: There is not a "friendly name" for the physical disk "PHYSICALDRIVE1".

```

File Share Witness

- Installation auf Hub Transport Server
- Hotfix auf Cluster Knoten erforderlich
<http://support.microsoft.com/kb/921181> (Reboot)
- Freigabe MNSFILESHARE (ist wählbar)
- Berechtigungen für Cluster Service Konto Vollzugriff
- Auf einem Clusterknoten:
cluster.exe res "Majority Node Set" /priv
MNSFileShare=\\HTSERVER\MNSFileShare
- Test:
cluster res "Majority Node Set" /priv



File Share Witness

MNS File Share aktivieren

```

C:\Documents and Settings\Administrator.DOMAIN>cluster res "Majority node set"
priv MNSFILESHARE=\\EX2007-DC\MNSFILESHARE

System warning 5024 (0x000013a0).
The properties were stored but not all changes will take effect until the next
time the resource is brought online.

C:\Documents and Settings\Administrator.DOMAIN>
    
```

Cluster Gruppe verschieben

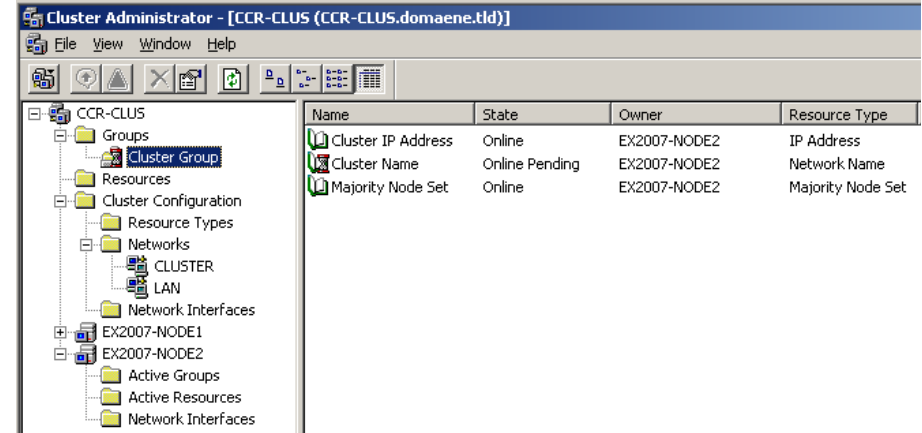
```

C:\Documents and Settings\Administrator.DOMAIN>cluster res "Majority Node set"
priv

Listing private properties for 'Majority Node set':

I Resource      Name                               Value
-----
S Majority Node set MNSFileShare                      \\EX2007-DC\MNSFILESHARE
D Majority Node set MNSFileShareCheckInterval        240 (0xf0)
D Majority Node set MNSFileShareDelay                 4 (0x4)

C:\Documents and Settings\Administrator.DOMAIN>
    
```



Test ob MNS auf dem richtigen Share liegt

Exchange Cluster Installation

- Windows Server 2003 SP1 oder Windows Server 2003 R2
- IIS 6 ohne NNTP und SMTP
- Powershell
- .NET Framework 2.0
- .NET Framework Update (926776)
- MMC 3.0
- MNS Cluster Update (921181)

Exchange Cluster Installation

Microsoft Exchange Server enables users to send and receive e-mail, schedule meetings, receive faxes, and receive voice mail.

Microsoft
Exchange Server 2007

Plan

Read about Microsoft Exchange Server 2007

Install

Step 1: Install I
Step 2: Install I
Step 3: Install I
Step 4: Install I
Step 5: Get Cri

Enhance

Read about Mic
Read about Mic
Install Forefror

Exchange Server 2007 Setup

- ☒ Introduction
- ☒ License Agreement
- ☒ Error Reporting
- ☒ Installation Type
- ☐ Readiness Checks
- ☐ Progress
- ☐ Completion

Installation Type

Select the Exchange Server installation type:

Typical Exchange Server Installation
The following will be installed on this computer:

- Hub Transport server role
- Client Access server role
- Mailbox server role
- Exchange Management Tools

Custom Exchange Server Installation
This option lets you select which of the following server ro install on this computer:

- Hub Transport
- Client Access
- Mailbox (with or without clustering)
- Unified Messaging
- Edge Transport
- Exchange Management Console

Specify the path for the Exchange Server installation:

C:\Program Files\Microsoft\Exchange Server

Help

< Back

Next >

Exchange Server 2007 Setup

- ☒ Introduction
- ☒ License Agreement
- ☒ Error Reporting
- ☒ Installation Type
- ☒ Server Role Selection
- ☐ Readiness Checks
- ☐ Progress
- ☐ Completion

Server Role Selection

Select the Exchange server roles you want to install on this computer:

- ☐ Mailbox Role
- ☐ Client Access Role
- ☐ Hub Transport Role
- ☐ Unified Messaging Role
- ☐ Edge Transport Server Role
- ☒ Active Clustered Mailbox Role
- ☐ Passive Clustered Mailbox Role

Description

The Exchange Management Tools provides the management tools needed to configure and manage Exchange Server.

Disk Space Allocation

Disk space required:	723.0 MB
Disk space available:	1263.1 MB

Specify the path for the Exchange Server installation:

C:\Program Files\Microsoft\Exchange Server

Browse...

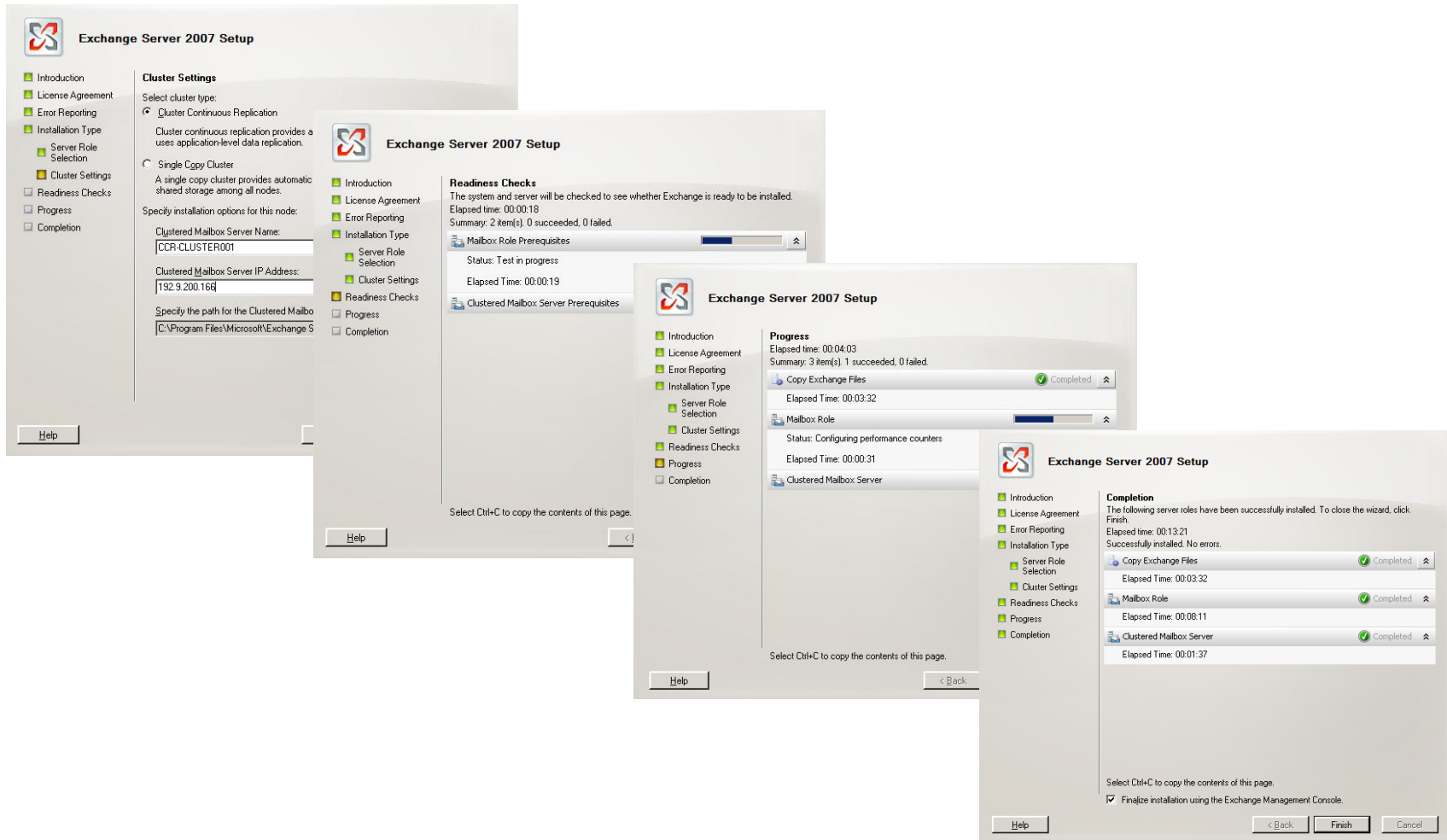
Help

< Back

Next >

Cancel

Exchange Cluster Installation



Exchange Cluster Installation

The image shows two screenshots of Windows administrative tools. The top screenshot is the 'Cluster Administrator' window for 'CCR-CLUS (CCR-CLUS.domaene.tld)'. It displays a tree view on the left with folders like Groups, Resources, and Networks. The main pane shows a table of cluster resources.

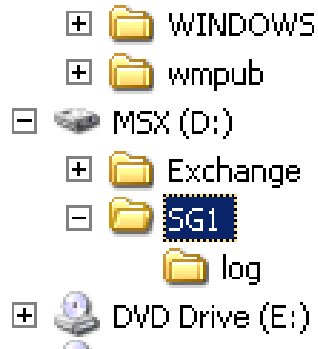
Name	State	Owner	Resource Type
IP Address (CCR-CLUSTER001)	Online	EX2007-NODE1	IP Address
Network Name (CCR-CLUSTER001)	Online	EX2007-NODE1	Network Name
Exchange System Attendant Instance (CCR-CLUSTER001)	Online	EX2007-NODE1	Microsoft Excha...
Exchange Information Store Instance (CCR-CLUSTER001)	Online	EX2007-NODE1	Microsoft Excha...
First Storage Group/Mailbox Database (CCR-CLUSTER001)	Online	EX2007-NODE1	Microsoft Excha...

The bottom screenshot is the 'Microsoft Exchange Server Configuration' console. The left tree shows 'Server Configuration' expanded. The main pane shows a table of server roles.

Name	Role	Version
CCR-CLUSTER001	Mailbox	Version 8.0 (Build 685.24)
EX2007-DC	Hub Transport, Client Acce...	Version 8.0 (Build 685.24)
EX2007-EDGE	Edge Transport	Version 8.0 (Build 685.24)

On the right side of the bottom screenshot, there is an 'Actions' pane with options like 'Modify Configuration Do...', 'View', 'Refresh', 'Help', and 'Manage Mailbox Role'.

Exchange Cluster Installation

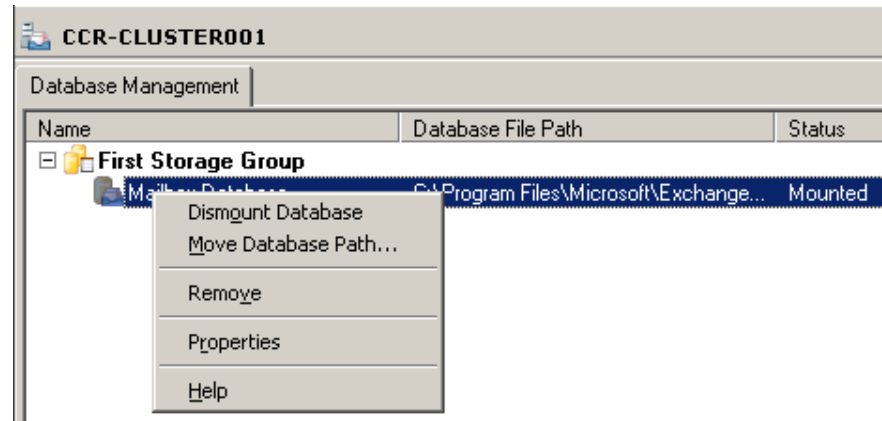


1) Log Verzeichnis vor dem Move

```
Machine: ex2007-node1 | Scope: domaene.tld
[PS] C:\Documents and Settings\Administrator.DOMAIN>move-StorageGroupPath -identity:"CCR-CLUSTER001\First Storage Group" -LogFolderPath:"D:\SG1\log" -SystemFolderPath:"D:\SG1\log" -configurationonly:$true

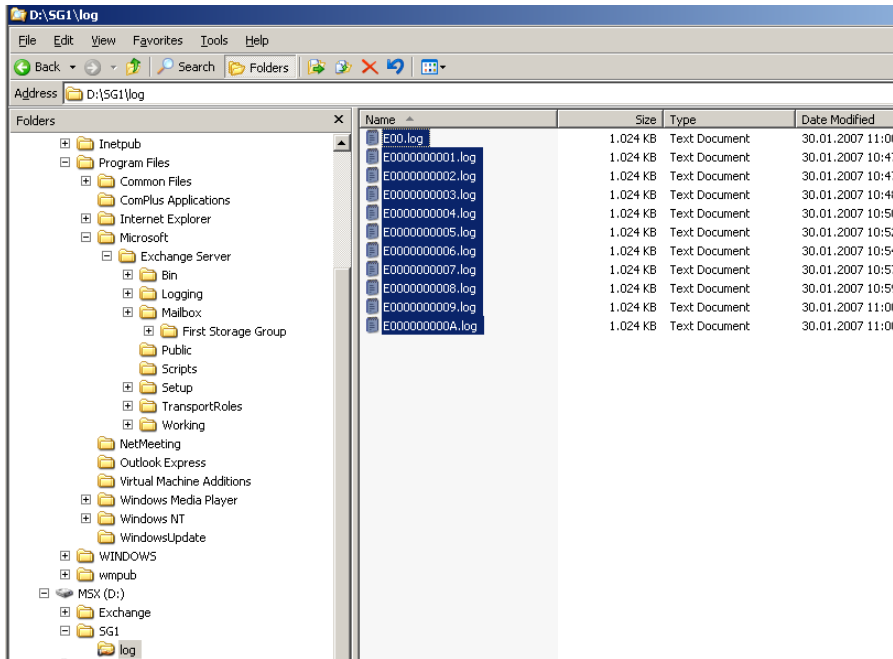
Confirm
Are you sure you want to perform this action?
Moving path of storage group "CCR-CLUSTER001\First Storage Group".
[Y] Yes [A] Yes to All [N] No [L] No to All [S] Suspend [?] Help
(default is "Y"):y
[PS] C:\Documents and Settings\Administrator.DOMAIN>
```

2) Datenbank dismounten

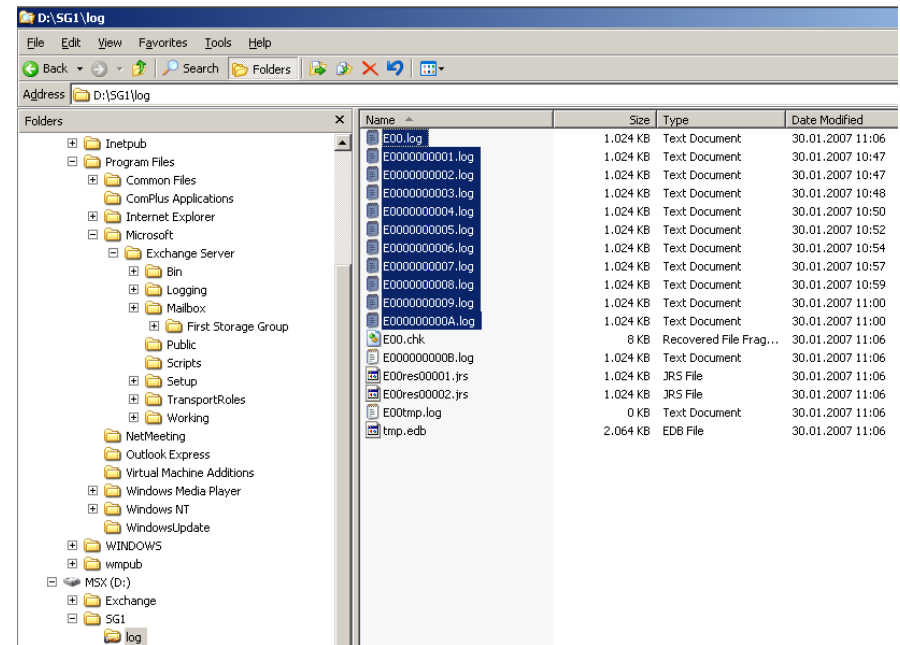


3) Log verschieben

Exchange Cluster Installation

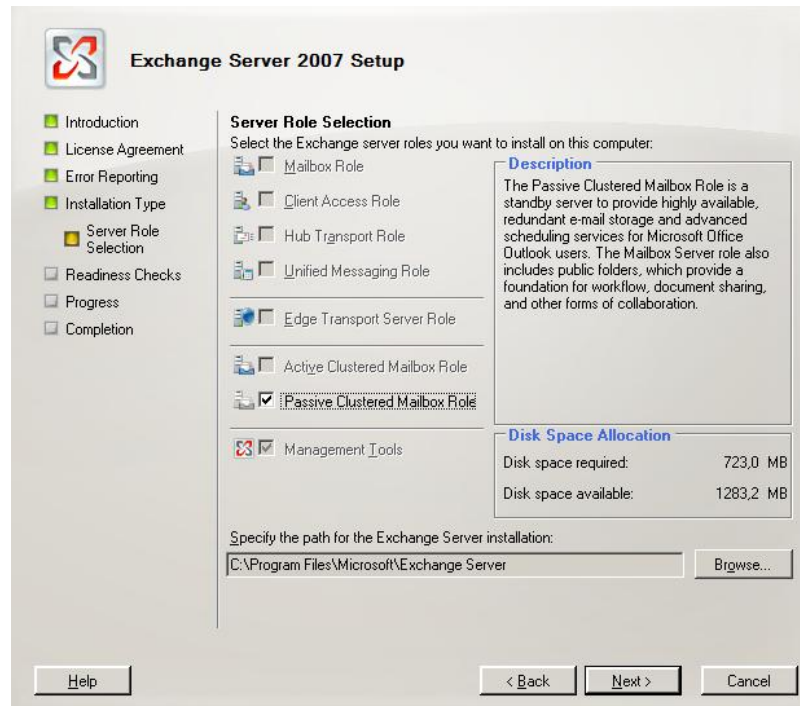


1) Verschieben der Logdateien



2) Datenbank mounten und Ergebnis betrachten

Exchange Cluster Installation



Passive Node

Transport Dumpster

- Eine Art Cache Verzeichnis für Transaktionslogdateien
- Bei einem Knotenausfall werden die Logs des Transport Dumpster eingelesen
- Liegen auf einem Hub Transport Server
- Konfiguration des Dumpster mit EMS

Transport Dumpster

- Beispiel: 20 MB Dumpster und 7 Tage Vorhaltezeit
- Dumpstergröße 135-300% der maximalen Nachrichtengröße

```

Machine: EX2007-DC | Scope: domaene.tld

Welcome to the Exchange Management Shell!

Full list of cmdlets:           get-command
Only Exchange cmdlets:        get-excommand
Cmdlets for a specific role:   get-help -role *UM* or *Mailbox*
Get general help:              help
Get help for a cmdlet:         help <cmdlet-name> or <cmdlet-name> -?
Show quick reference guide:    quickref
Exchange team blog:           get-exblog
Show full output for a cmd:    <cmd> ! format-list

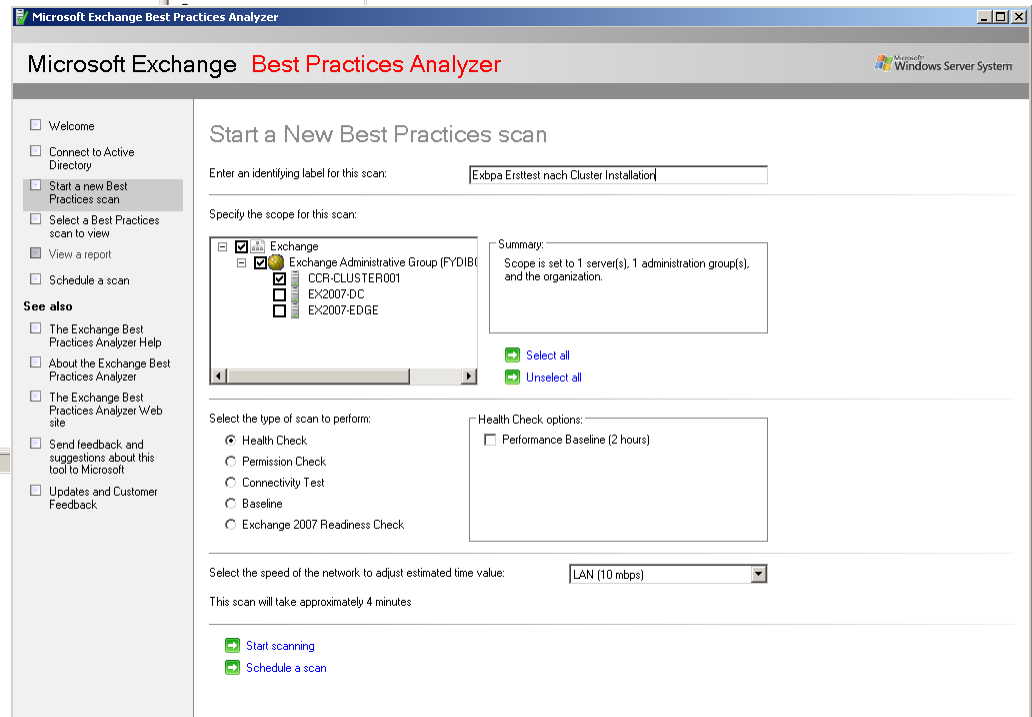
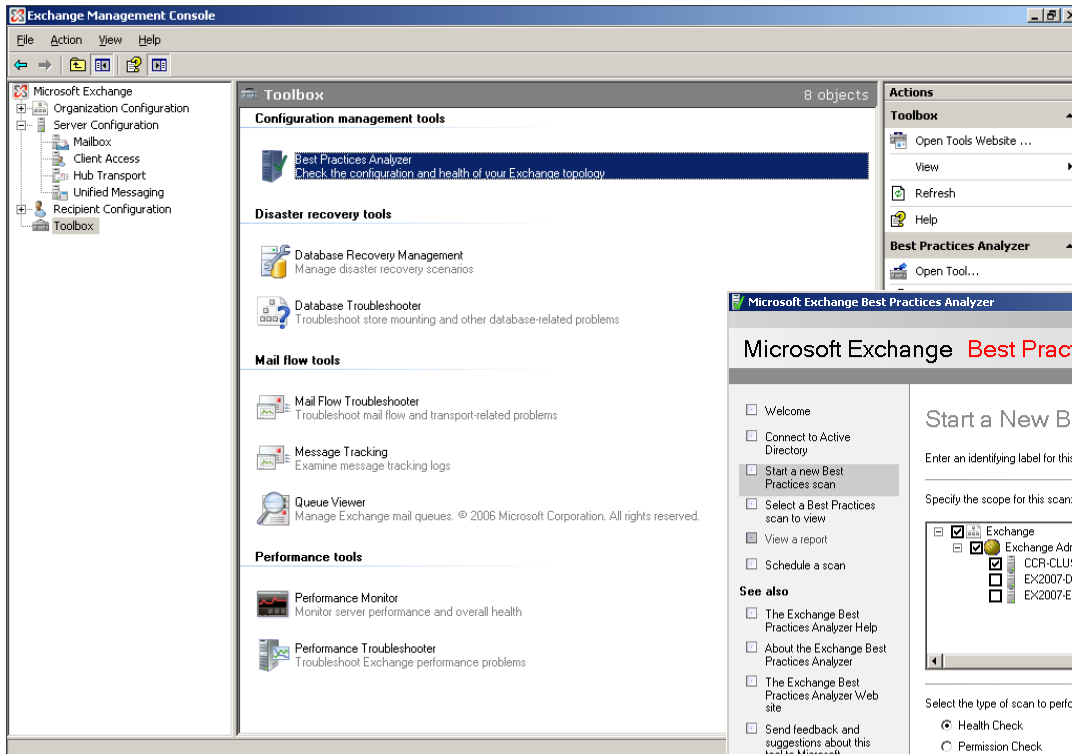
Tip of the day #60:

Möchten Sie alle E-Mail-Nachrichten entfernen, die von einem bestimmten Domänennamen aus den Warteschlangen des Servers gesendet wurden, ohne einen Unzustellbarkeitsbericht zu generieren? Geben Sie Folgendes ein:

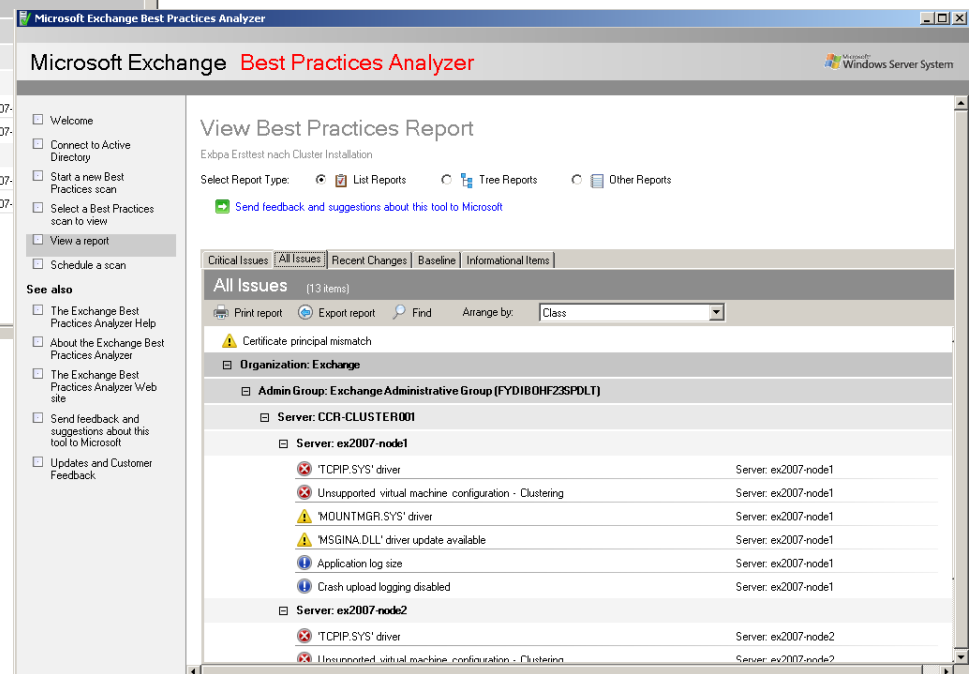
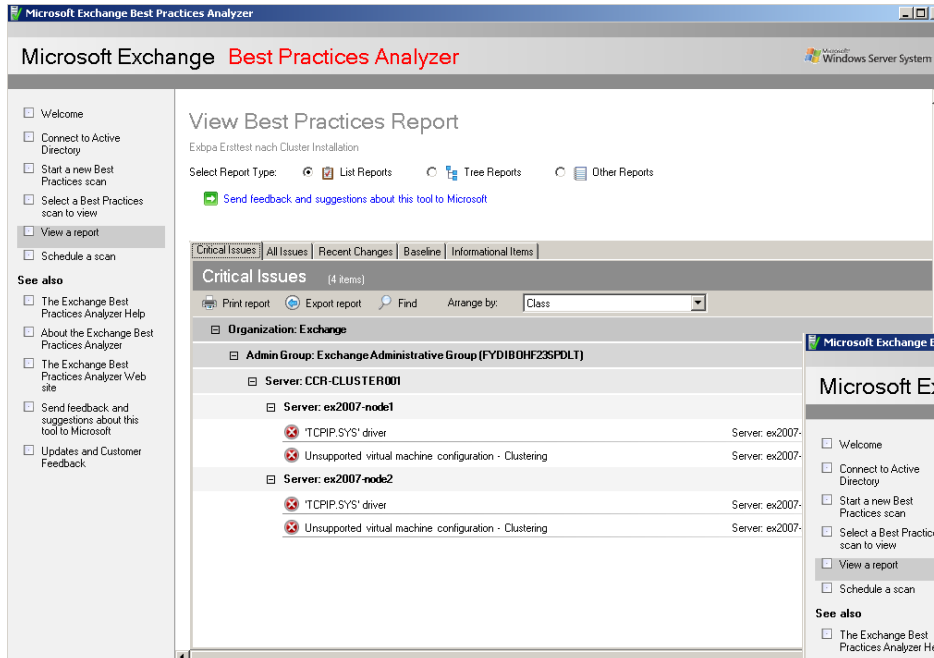
Remove-Message -WithNDR $False -Filter < FromAddress -Like "*@contoso.com" >

[PS] C:\Dokumente und Einstellungen\Administrator.W2K3>set-transportconfig -MaxDumpsterSizePerStorageGroup 20MB -MaxDumpsterTime 07.00:00:00
WARNUNG: Der Befehl wurde erfolgreich abgeschlossen, es wurden jedoch keine Einstellungen von 'Transport Settings' geändert.
[PS] C:\Dokumente und Einstellungen\Administrator.W2K3>
  
```

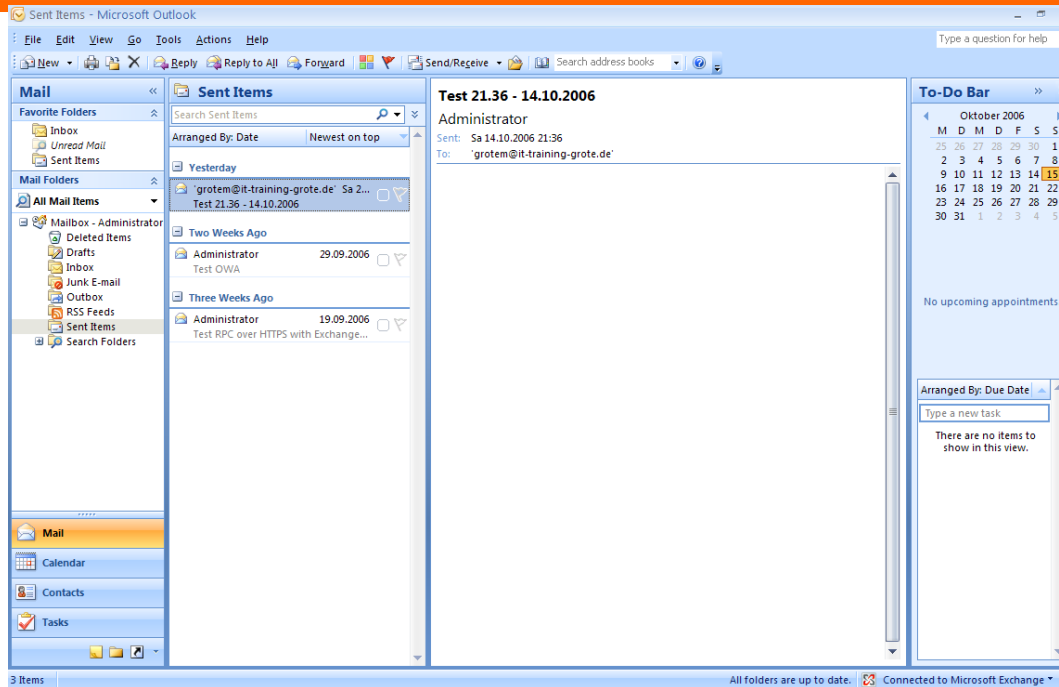
EXBPA



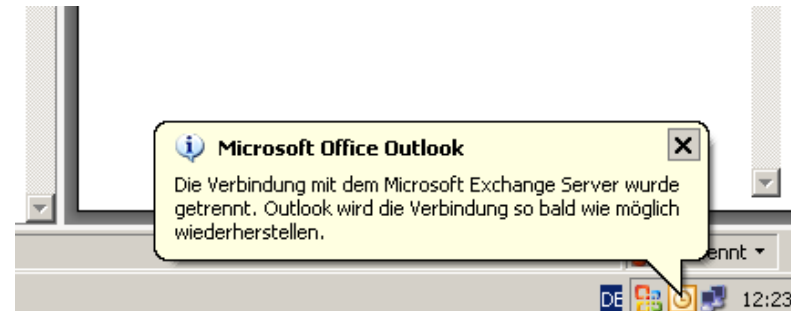
EXBPA



Outlook 2007 Konfiguration



Der Outlook Cache Mode sorgt für minimale Unterbrechung



Failover / Failback

The image displays two screenshots of the Windows Cluster Administrator console, illustrating a failover operation.

Top Screenshot: The console shows the cluster 'CCR-CLUS (CCR-CLUS.domaene.tld)'. A context menu is open over the 'CCR-CLUSTER001' group, with the 'Bring Online' option selected. The menu also includes 'Take Offline', 'Move Group', 'Delete', 'Rename', and 'New'. The main pane shows a list of resources:

Name	State	Owner	Resource Type
Exchange Information Store Instance (CCR-CLUSTER001)	Online	EX2007-NODE1	Microsoft Excha...
Exchange System Attendant Instance (CCR-CLUSTER001)	Online	EX2007-NODE1	Microsoft Excha...
First Storage Group/Mailbox Database (CCR-CLUSTER001)	Online	EX2007-NODE1	Microsoft Excha...
IP Address (CCR-CLUSTER001)	Online	EX2007-NODE1	IP Address
Network Name (CCR-CLUSTER001)	Online	EX2007-NODE1	Network Name

Bottom Screenshot: The console shows the same cluster, but the resources are now in a 'Pending' state on EX2007-NODE2. The 'CCR-CLUSTER001' group is selected in the left pane. The main pane shows a list of resources:

Name	State	Owner	Resource Type
Exchange Information Store Instance (CCR-CLUSTER001)	Online Pending	EX2007-NODE2	Microsoft Excha...
Exchange System Attendant Instance (CCR-CLUSTER001)	Online Pending	EX2007-NODE2	Microsoft Excha...
First Storage Group/Mailbox Database (CCR-CLUSTER001)	Online Pending	EX2007-NODE2	Microsoft Excha...
IP Address (CCR-CLUSTER001)	Online	EX2007-NODE2	IP Address
Network Name (CCR-CLUSTER001)	Online Pending	EX2007-NODE2	Network Name

Failover / Failback

The screenshot shows the Cluster Administrator console for a cluster named CCR-CLUS. The left pane shows the tree view with 'Groups' expanded, showing 'CCR-CLUSTER001'. The right pane shows a list of resources and their states.

Name	State	Owner	Resource Type	Description
Exchange Information Store Instance (CCR-CLUSTER001)	Offline	EX2007-NODE1	Microsoft Excha...	
Exchange System Attendant Instance (CCR-CLUSTER001)	Online Pending	EX2007-NODE1	Microsoft Excha...	
First Storage Group/Mailbox Database (CCR-CLUSTER001)	Offline	EX2007-NODE1	Microsoft Excha...	
IP Address (CCR-CLUSTER001)	Online Pending	EX2007-NODE1	IP Address	
Network Name (CCR-CLUSTER001)	Online Pending	EX2007-NODE1	Network Name	

A command prompt window is open, showing the following text:

```
Machine: ex2007-node1 | Scope: domaene.tld

Cmdlets for a specific role:  get-help -role *UM* or *Mailbox*
Get general help:             help
Get help for a cmdlet:        help <cmdlet-name> or <cmdlet-name> -?
Show quick reference guide:   quickref
Exchange team blog:          get-exblog
Show full output for a cmd:   <cmd> ! format-list

Tip of the day #3:
The Exchange Management Shell is a calculator too! Try it directly in the command line:

1.2343+3123 or (23/435)*2

[PS] C:\Documents and Settings\Administrator.DOMAIN>move-clusteredMailboxServer -Identity CCR-CLUSTER001 -targetmachine EX2007-NODE1 -MoveComment "EMC Failback test"

Confirm
Are you sure you want to perform this action?
Moving clustered mailbox server "CCR-CLUSTER001" to target node "EX2007-NODE1" with move comment "EMC Failback test".
[Y] Yes [A] Yes to All [N] No [L] No to All [S] Suspend [?] Help
(default is "Y"):y
```

At the bottom of the console, it says "For Help, press F1".

Exchange Cluster entfernen

Clustered Mailbox Owner bestimmen

```
CA\ Command Prompt
C:\Program Files\Microsoft\Exchange Server\Bin>setup /removeCMS /CMSName:CCR-Cluster1
Welcome to Microsoft Exchange Server 2007 Unattended Setup
Preparing Exchange Setup
The following server roles will be removed
  Clustered Mailbox Server
Performing Microsoft Exchange Server Prerequisite Checks
  Clustered Mailbox Role Checks .....
Configuring Microsoft Exchange Server
  Clustered Mailbox Server .....
The Microsoft Exchange Server setup operation
C:\Program Files\Microsoft\Exchange Server\Bin
```

CMS entfernen

Passive Node
entfernen

```
CA\ Command Prompt - setup /mode:uninstall
C:\Program Files\Microsoft\Exchange Server\Bin>setup /mode:uninstall
Welcome to Microsoft Exchange Server 2007 Unattended Setup
Preparing Exchange Setup
The following server roles will be removed
  Mailbox Role
  Management Tools
Performing Microsoft Exchange Server Prerequisite Check
  Mailbox Role Checks ..... COMPLETED
Configuring Microsoft Exchange Server
  Mailbox Server Role ..... 7%
```

Exchange Cluster entfernen - II

```

C:\Program Files\Microsoft\Exchange Server\Bin>setup /mode:uninstall

Welcome to Microsoft Exchange Server 2007 Unattended Setup

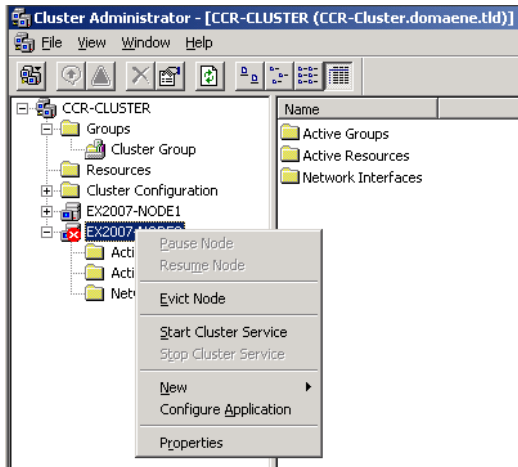
Preparing Exchange Setup

The following server roles will be removed
Mailbox Role
Management Tools

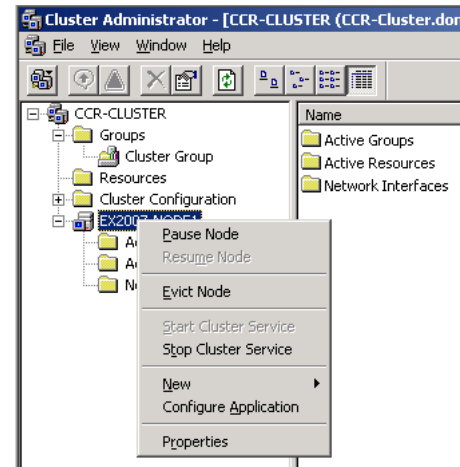
Performing Microsoft Exchange Server Prerequisite Check

Mailbox Role Checks ..... COMPLETED

Configuring Microsoft Exchange Server
Mailbox Server Role ..... 7%
  
```



Passive Node
entfernen



Last Node
entfernen

Exchange Cluster entfernen - GUI

The image displays three sequential screenshots of the Exchange Server 2007 Setup wizard, illustrating the process of removing server roles from an Exchange cluster.

Top Left Screenshot: Exchange Maintenance Mode
The wizard is in the 'Exchange Maintenance Mode' step. The left sidebar shows the progress: Exchange Maintenance Mode (selected), Server Role Selection, Readiness Checks, Progress, and Completion. The main pane states: 'Exchange Maintenance Mode. Microsoft Exchange Server is currently installed on this computer. This wizard will allow you to remove Exchange server roles from this computer.'

Top Middle Screenshot: Server Role Selection
The wizard is in the 'Server Role Selection' step. The left sidebar shows the progress: Exchange Maintenance Mode, Server Role Selection (selected), Readiness Checks, Progress, and Completion. The main pane lists server roles to be removed: Mailbox Role, Client Access Role, Hub Transport Role, Unified Messaging Role, Edge Transport Server Role, Active Clustered Mailbox Role, and Passive Clustered Mailbox Role. A 'Description' tab is active, showing a small 'Exchange Server' icon and a list of roles: Exchange Maintenance Mode, Server Role Selection, Readiness Checks, Progress, and Completion. Below the list, it says 'Specify the path for the Exchange Server' with the path 'C:\Program Files\Microsoft\Exchange S'.

Top Right Screenshot: Completion
The wizard is in the 'Completion' step. The left sidebar shows the progress: Exchange Maintenance Mode, Server Role Selection, Readiness Checks, Progress, and Completion (selected). The main pane states: 'Completion. The following server roles have been successfully removed. To close the wizard, click Finish. Elapsed time: 00:05:47. Successfully removed. No errors.' A table lists the removed roles: Mailbox Role (Elapsed Time: 00:02:59) and Remove Exchange Files (Elapsed Time: 00:02:47). Both are marked as 'Completed'.

Bottom Left Screenshot: Readiness Checks
The wizard is in the 'Readiness Checks' step. The left sidebar shows the progress: Exchange Maintenance Mode, Server Role Selection, Readiness Checks (selected), Progress, and Completion. The main pane states: 'Readiness Checks. The system will be removed. Elapsed Summary. Mail. Elapsed Time: 00:02:47. Select Ctrl+C to copy the contents of this page.'

Bottom Middle Screenshot: Uninstall
The wizard is in the 'Uninstall' step. The left sidebar shows the progress: Exchange Maintenance Mode, Server Role Selection, Readiness Checks, Progress, and Completion. The main pane states: 'Uninstall. Select Ctrl+C to copy the contents of this page.'

Bottom Right Screenshot: Finish
The wizard is in the 'Finish' step. The left sidebar shows the progress: Exchange Maintenance Mode, Server Role Selection, Readiness Checks, Progress, and Completion. The main pane states: 'Finish. Select Ctrl+C to copy the contents of this page.'

Vor der Deinstallation des aktiven Cluster Knoten müssen alle Mailboxen verschoben oder deaktiviert werden

Links

- <http://nw-america.com>
- <http://www.microsoft.com/windowsserver2003/community/centers/clustering/default.aspx>
- <http://www.microsoft.com/windowsserver2003/technologies/clustering/default.aspx>
- <http://msexchangeteam.com/archive/2006/08/09/428642.aspx>
- <http://www.msexchange.org/tutorials/Installing-Configuring-Testing-Exchange-2007-Cluster-Continuous-Replication-Based-Mailbox-Server-Part1.html>
- <http://support.microsoft.com/default.aspx?scid=kb;en-us;887827>
- <http://support.microsoft.com/default.aspx?scid=kb;en-us;895981>
- <http://support.microsoft.com/default.aspx?scid=kb;en-us;818665>
- <http://www.microsoft.com/downloads/details.aspx?FamilyID=96f76ed7-9634-4300-9159-89638f4b4ef7&DisplayLang=en>
- <http://www.microsoft.com/technet/prodtechnol/virtualserver/deploy/cvs2005.mspx>
- <http://www.exchange-mail.org/articles/VMware%20clustering%201.0.pdf>

Fragen



Das Ende

- Vielen Dank für Ihre Aufmerksamkeit



The image shows a business card for IT-Training-Grote. The card has a blue and orange color scheme. On the left side, there is a logo consisting of three orange vertical bars of varying heights, followed by the text "TRAINING-GROTE" in white and "SCHULUNG & CONSULTING" in smaller white text below it. Below the logo, there is a handwritten orange "i Contact" with an arrow pointing to the right. In the background of the left side, there is a faint, large fingerprint. On the right side, the contact information is listed in white text on a dark blue background.

TRAINING-GROTE
SCHULUNG & CONSULTING

i Contact →

MARC GROTE
IT-TRAINER & CONSULANT

HALTENHOFFSTR. 229
30419 HANNOVER-HERRENHAUSEN

MOBIL: 0176 / 233 802 79

E-MAIL: GROTEM@IT-TRAINING-GROTE.DE
WEBSITE: WWW.IT-TRAINING-GROTE.DE