OPC UA
DEVELOPMENT TRAINING

OPC UA Administration

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AGENDA

- ADMINISTRATION

- CONFIGURATION

- TROUBLESHOOTING

OPC UA ADMINISTRATION

■ TUTORIAL AS PDF AVAILABLE FROM

HTTPS://TECHNOSOFTWARE.COM/DOCUMENTATION/OPC_UA_NET_STANDARD_INSTALLATION_GUIDE.PDF

AGENDA

- ◼ ADMINISTRATION

  - INTRODUCTION IN CERTIFICATES AND HOW THEY WORK

- ◼ CONFIGURATION

  - INTRODUCTION INTO THE LOCAL DISCOVERY SERVER (LDS)

  - INTRODUCTION INTO THE GLOBAL DISCOVERY SERVER (GDS)

- ◼ TROUBLESHOOTING

  - DIFFERENCES OPC UA AND CLASSIC OPC, POSSIBLE ISSUES
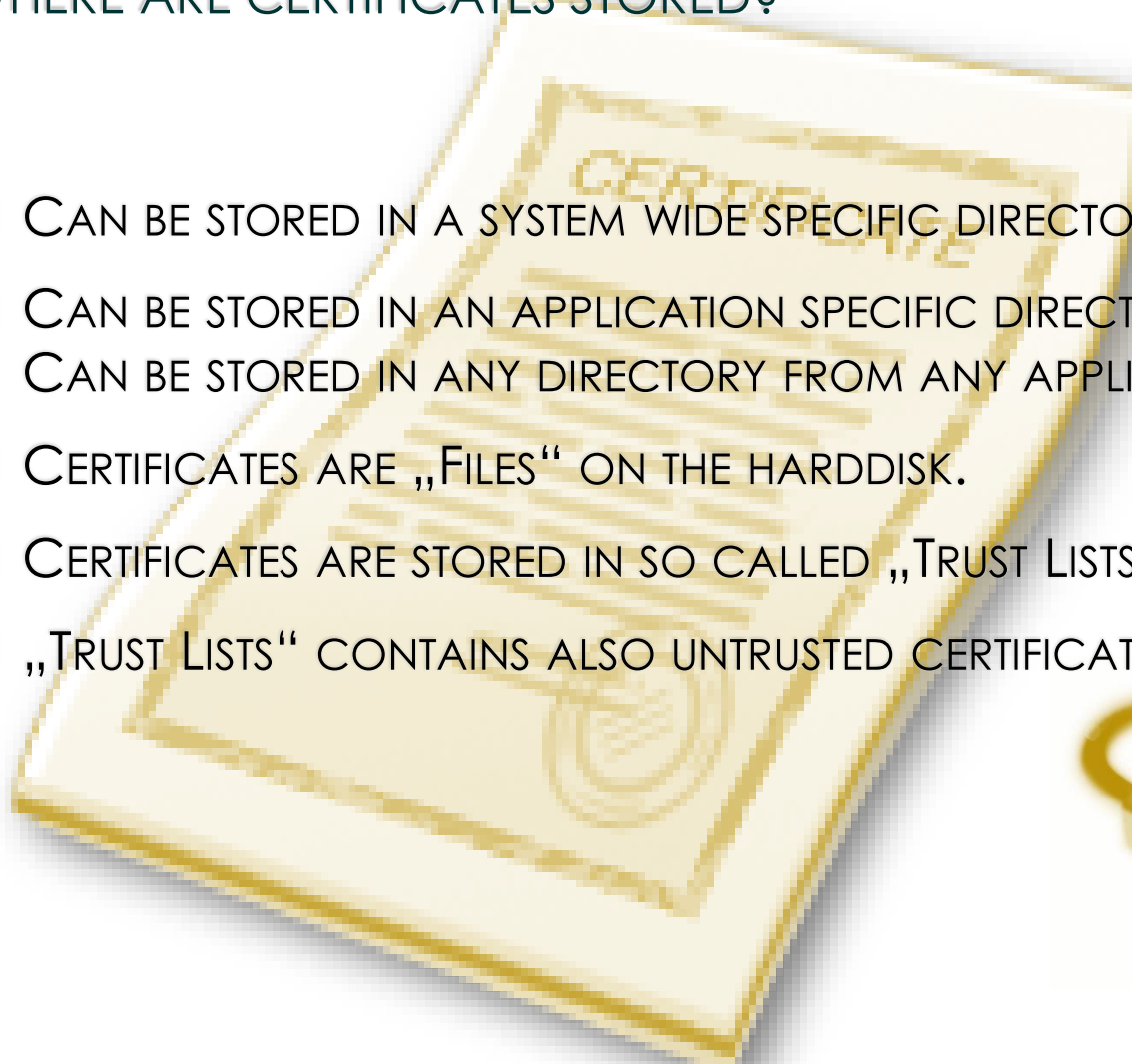
ADMINISTRATION
WHAT ARE CERTIFICATES?

- A CERTIFICATE IS A DIGITAL EQUIVALENT OF A PASSPORT.

- AN ENCRYPTED FILE FOR UNIQUELY IDENTIFYING AN OBJECT.

- CERTIFICATES CAN REPRESENT AN APPLICATION OR A HUMAN BEING.

- CERTIFICATES ARE USED FOR VALIDATING PERSONS AND APPLICATIONS.

- CERTIFICATES ARE A FORM OF AUTHENTICATION.

- CERTIFICATE TECHNOLOGY IS WIDELY USED

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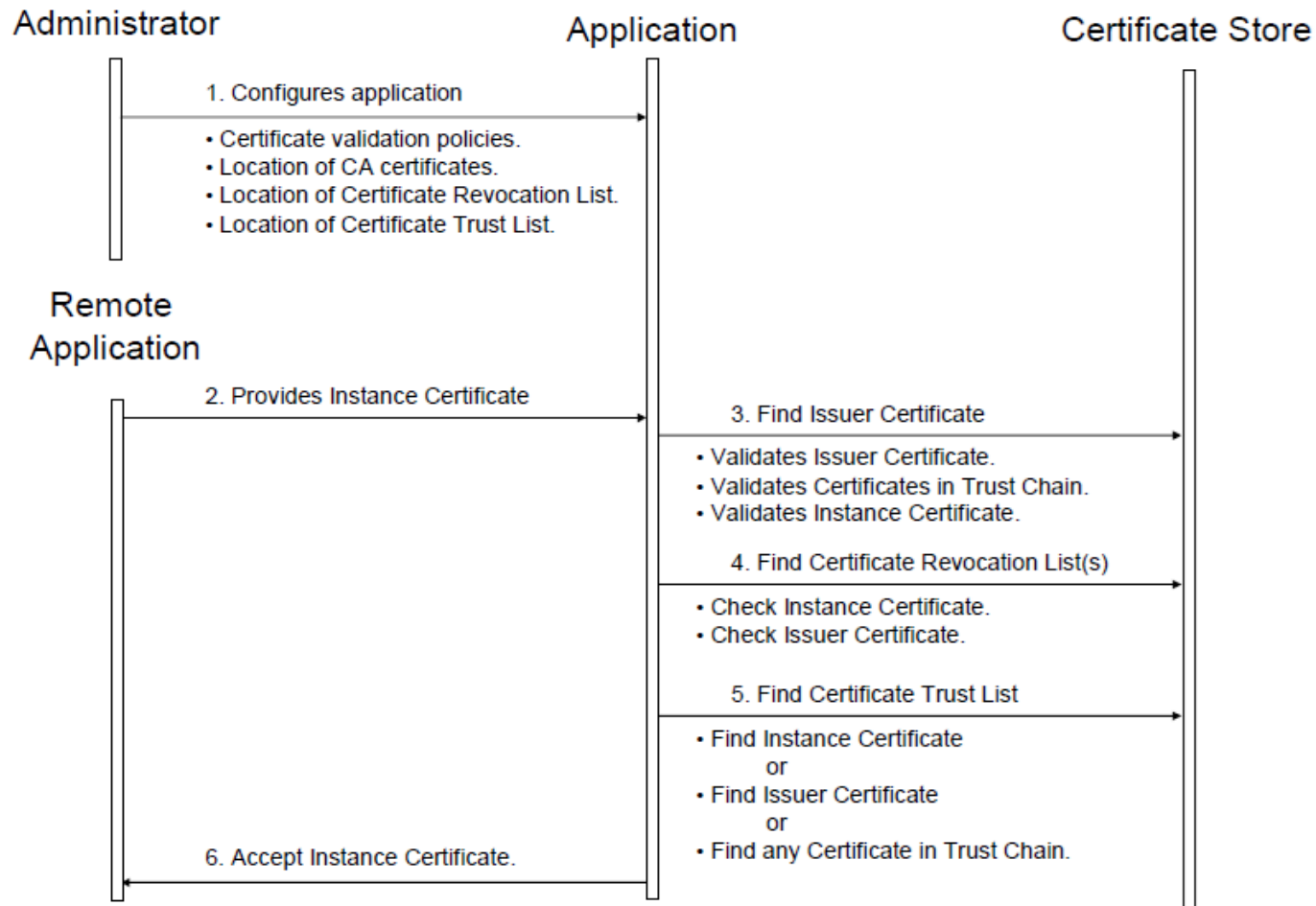
ADMINISTRATION
WHERE ARE CERTIFICATES STORED?

- Can be stored in a system wide specific directory.

- Can be stored in an application specific directory.
  Can be stored in any directory from any application.

- Certificates are „Files" on the harddisk.

- Certificates are stored in so called „Trust Lists".

- „Trust Lists" contains also untrusted certificates.

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ADMINISTRATION
HOW ARE CERTIFICATES VALIDATED?

Administrator   Application   Certificate Store

1. Configures application

- Certificate validation policies.
- Location of CA certificates.
- Location of Certificate Revocation List.
- Location of Certificate Trust List.

Remote Application

2. Provides Instance Certificate

3. Find Issuer Certificate

- Validates Issuer Certificate.
- Validates Certificates in Trust Chain.
- Validates Instance Certificate.

4. Find Certificate Revocation List(s)

- Check Instance Certificate.
- Check Issuer Certificate.

5. Find Certificate Trust List

- Find Instance Certificate
    or
- Find Issuer Certificate
    or
- Find any Certificate in Trust Chain.

6. Accept Instance Certificate.

DISCOVERY SERVER
OVERVIEW

■ The discovery process allows Clients to find Servers on the network and then discover how to connect to the Server.

■ Clients and Servers can be on the same host, on different hosts in the same subnet, or even on completely different locations in an administrative domain.

■ The Discovery Services are specified in Part 4.

■ They are implemented by individual Servers and by dedicated DiscoveryServers.

DISCOVERY SERVER
OVERVIEW

■ THE FOLLOWING DEDICATED DiscoveryServers PROVIDE A WAY FOR CLIENTS TO DISCOVER REGISTERED OPC UA SERVERS IN DIFFERENT SITUATIONS:

- A LocalDiscoveryServer (LDS) MAINTAINS DISCOVERY INFORMATION FOR ALL SERVERS THAT HAVE REGISTERED WITH IT, USUALLY ALL SERVERS AVAILABLE ON THE HOST THAT IT RUNS ON.

- A GlobalDiscoveryServer (GDS) MAINTAINS DISCOVERY INFORMATION FOR OPC UA APPLICATIONS AVAILABLE IN AN ADMINISTRATIVE DOMAIN.

DISCOVERY SERVER
LOCAL DISOVERY SERVER (LDS)

■ THE OPC FOUNDATION MAINTAINS A LDS FOR WINDOWS AS DISTRIBUTABLE AVAILABLE FOR REGISTERED USERS.

■ SOURCE CODE OF THE LDS IS AVAILABLE FOR OPC FOUNDATION MEMBERS.

■ A LDS FOR OPERATING SYSTEMS OTHER THEN WINDOWS IS NOT AVAILABLE DIRECTLY FROM THE OPC FOUNDATION.

DISCOVERY SERVER
GLOBAL DISOVERY SERVER (GDS)

■ A GDS IS AN OPC UA SERVER WHICH ALLOWS CLIENTS TO SEARCH FOR SERVERS IN THE ADMINISTRATIVE DOMAIN. IT MAY ALSO PROVIDE CERTIFICATE SERVICES.

■ IT PROVIDES METHODS THAT ALLOW APPLICATIONS TO SEARCH FOR OTHER APPLICATIONS.

■ THE OPC FOUNDATION PROVIDES SAMPLE SOURCE CODE OF A GDS IN C#/.NET 4.5

TROUBLESHOOTING
UA VS CLASSIC OPC

UA

- Same issues as for all applications using TCP / IP

- Certificate Management

Classic OPC

- Same issues as for all applications using TCP / IP

- COM/DCOM permissions

- Domain vs. Workgroup

- Usage different versions of Windows

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TROUBLESHOOTING
POSSIBLE ISSUES

- Firewalls

  - Prevents TCP socket connection
  - Blocked Port
  - NAT: IP unfamiliar; Wrong Forwarding

- Certificates

  - Certificate not trusted
  - Certificate expired
  - Revoked certificate
  - Certificate not valid

- Permissions

  - Missing permissions
  - Access denied

- Network

  - Network latency
  - Communication with interruptions
  - Faulty Equipment

TROUBLESHOOTING
ERROR PREVENTION

■ CREATION OF APPLICATION-SPECIFIC TROUBLESHOOTING DOCUMENTATION THAT IS EASY TO FIND.

■ STEPS WHICH CAN BE AUTOMATED SHOULD NOT NEED TO BE PERFORMED MANUALLY BY THE USER.

■ USAGE OF TOOLS FOR THE AUTOMATION OF:

- CREATING AN APPLICATION CERTIFICATE AND ADDING IT TO THE „TRUST-LIST".

- OPENING OF THE USED TCP PORTS IN THE WINDOWS FIREWALL.

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