



# OPC UA DEVELOPMENT TRAINING

OPC UA ADMINISTRATION

# AGENDA



- ADMINISTRATION
- CONFIGURATION
- TROUBLESHOOTING

# OPC UA ADMINISTRATION

- TUTORIAL AS PDF AVAILABLE FROM

[HTTPS://TECHNOSOFTWARE.COM/DOCUMENTATION/OPC UA SOLUTION NET INSTALLATION GUIDE.PDF](https://technosoftware.com/documentation/opc_ua_solution_net_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



# ADMINISTRATION

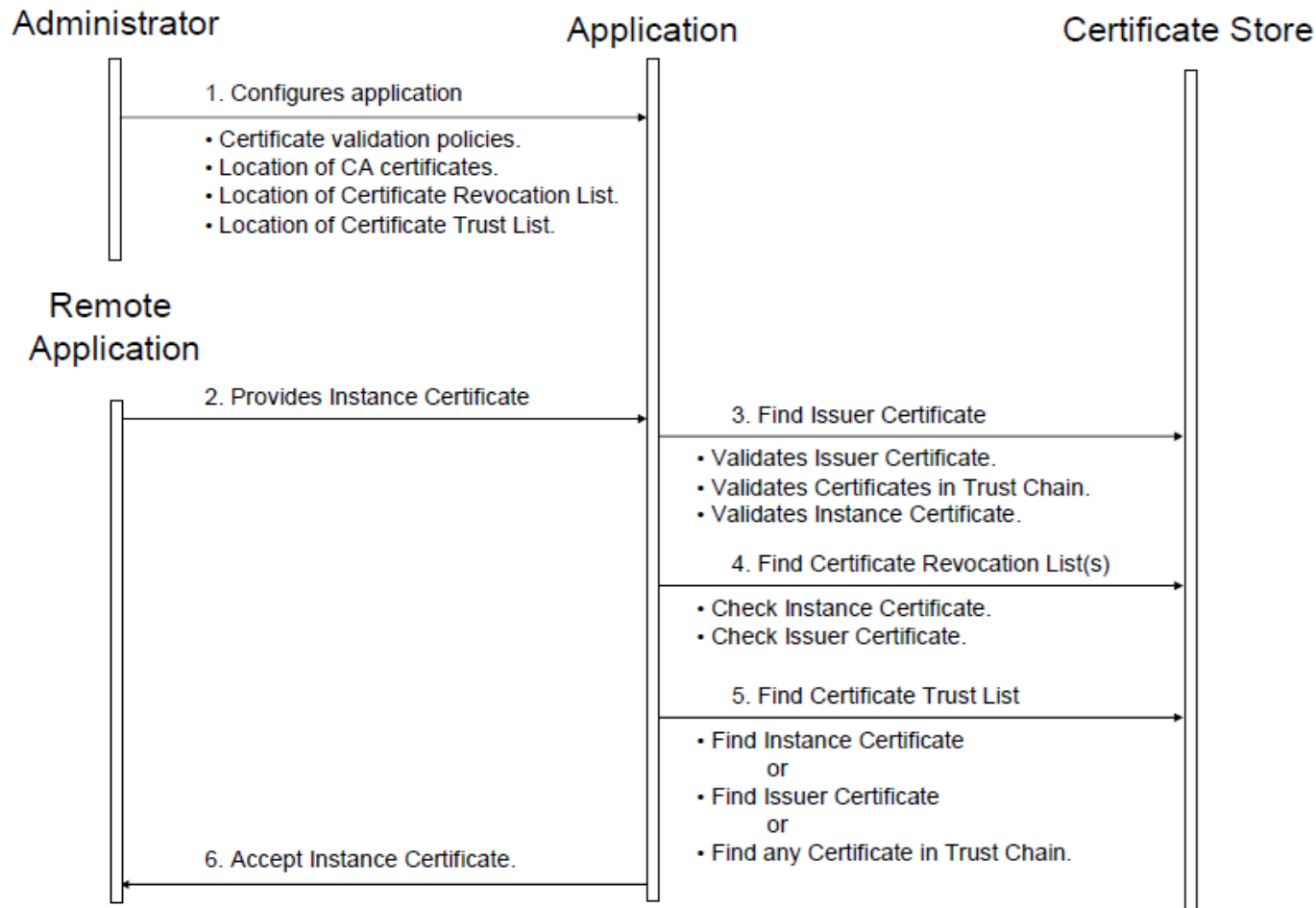
## WHERE ARE CERTIFICATES STORED?

- 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.



# ADMINISTRATION

## HOW ARE CERTIFICATES VALIDATED?



# 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 DISCOVERY 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 DISCOVERY 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

# 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.